What are the factors influencing GPs in the recognition and referral of suspected lung cancer?

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Abstract

Background - Lung cancer is the second most common cancer diagnosed in the UK after breast cancer. Around 41,000 people were diagnosed with lung cancer in the UK in 2008 (or 112 people every day). Patients with symptoms suggestive of lung cancer usually present to their GP first who operate a gatekeeping role for referrals into secondary care.

Aims - This study aimed to identify factors influencing GPs in the recognition and referral of patients with suspected lung cancer and to identify potential modifiable factors in order to develop interventions in the future to enable GPs to recognise and refer patients with lung cancer appropriately.

Methods - Thirty six in-depth interviews with GPs were conducted across Hull, East Riding of Yorkshire, North East Lincolnshire and North Yorkshire. The interviews were in two parts: first, a number of clinical case scenarios were presented to the participants and think aloud methodology applied to establish insights into GPs cognitive processes in decision making. The second part was an in-depth exploration of the process of recognition and referral of patients with suspected lung cancer symptoms. Thematic analysis was used for the development of key themes.

Findings - Data analysis identified four key themes from the data: [1] the ways in which GPs make decisions and in particular how they deal with challenging or unusual presentations, [2] understanding the differences in how GPs run their practices and how this may impact upon decision making, [3] the complexity of general practice and [4] the pressures faced by general practitioners. The findings from the think aloud method emphasised the focus participants placed on symptoms, context and patient factors in the development of a clinical hypothesis. It was then a process of seeking to prove or disprove a hypothesis by working through a list of differential diagnoses and complexity within the time constraints and context of the consultation. The open-ended interviews added reliability by corroborating some of the think aloud findings regarding knowledge and compliance of lung cancer guidelines but also introduced a broader perspective about practice factors involving internal organisational culture, structures and processes not mentioned in think aloud but which may influence participants in consultations.

Conclusion - The study has learned that the recognition and referral of lung cancer is complex. The research findings highlight a range of factors which help understand what makes it easier to recognise and refer lung cancer and also what are the barriers to recognising and referring lung cancer in general practice and how this may potentially impact on GP consultations.

Contents

The Thesis

Chapter 1

List of Tables

List of Figures

List of Boxes

Preface

This thesis is divided into 9 chapters:

Chapter 1 introduces lung cancer and why it is of importance to diagnose early lung cancer and a rationale for examining the area under study. The chapter will present an overview of the area of research and describe the research aims.

Chapter 2 provides a literature review which will examine factors influencing the role of GPs in the referral and diagnosis of lung cancer. The chapter will present theoretical aspects on presentation and recognition of cancer diagnosis and outline the knowledge and evidence of the factors impacting on cancer diagnosis. The literature on the concept of delay will be presented from theoretical and historical perspectives.

Chapter 3 is an additional literature review chapter which will explore the literature related to clinical decision making in general practice and explore aspects of general practice related to cancer recognition and diagnosis.

Chapter 4 presents the theoretical underpinnings to the approach taken to the study. The chapter will examine philosophical positions of epistemology and ontology. The chapter will then comprise a review of in-depth interviewing, its principles and practice. An analysis of the methods will be presented alongside a review of the advantages and disadvantages of the in-depth interviews and the think aloud method.

Chapter 5 provides a detailed view of the research methods, and describes the research setting under study, the research methods used and the relevant processes undertaken to enable the student to recruit and obtain the participant data for analysis.

Chapter 6 presents the findings of the qualitative in-depth interviews with GPs.

Chapter 7 presents the findings from the think aloud analysis from the four clinical case scenarios that were presented to each participant.

Chapter 8 presents a synthesis of the findings from the open ended interviews (Chapter 6) and the think aloud clinical case scenarios (Chapter 7).

Chapter 9 provides a discussion of the results presented in Chapters 6 and 7. The assimilated findings are discussed within the context of relevant theory and literature. The overall strengths and limitations of the work are presented. A reflexive account of the research is also presented. Implications for policy and clinical practice are outlined and suggestions for future research in this area are made.

Acknowledgements

As I reflect back on the journey that has been my PhD, I am struck by the distance I have travelled. It has been a long three years, even with the privilege of being a full time student and the flexibility and capacity to work and think about my research 24/7 that this brings. I am in awe of the people who complete a PhD and work full time, often in high level, challenging and complex roles, which I imagine leaves little time for family, friends and for absorbing the simple joys of life while they are focused on their academic studies. At times I have found the learning process fulfilling, rewarding and inspirational; at others challenging, difficult and isolating. It was during the latter times I had cause to reflect on whether the research direction I took was the right one, and when I had most cause to be thankful for the time, advice and listening skills so freely given. I would like to thank my friend and colleague Maxine Craig whose encouragement, guidance, support and thinking has helped me at every stage of my research journey especially at times when I was in the swampy lowlands of my research. I would also like to thank Julie Taylor-Clark for her friendship, belief and kindness, and to whom I owe such a great deal for her help in facilitating the resourcing of my PhD and in achieving my personal goals. I would like to thank my supervisory team at Hull York Medical School, particularly Prof Una Macleod for having patience with my random use of apostrophe and Prof Ian Watt and Prof Mike Lind, Dr Laura Sheard and Dr Yvonne Birks, each of whom gave their time, advice and guidance as I navigated my way through the academic process. I am also thankful to my fellow PhD students who were the real inspiration and for their advice and friendship; in particular Ed Richfield who has to be one of the nicest, supportive and most genuine of chaps you can ever meet. I would also like to mention Amy Gadoud and Ann Hutchinson whose conversations and discussions on life, research and beyond were most stimulating and inspiring.

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Author’s declaration

‘I confirm that this work is original and that if any passage(s) or diagram(s) have been copied from academic papers, books, the internet or any other sources these are clearly identified by the use of quotation marks and the reference(s) is fully cited. I certify that, other than where indicated, this is my own work and does not breach the regulations of HYMS, the University of Hull or the University of York regarding plagiarism or academic conduct in examinations. I confirm that any patient information obtained to produce this piece of work has been appropriately anonymised. I have read the HYMS Code of Practice on Academic Misconduct, and state that this piece of work is my own and does not contain any unacknowledged work from any other sources’.

Chapter 1

Background

1.1 Basis for my PhD

The driving force behind my PhD was to understand what influencing and modifiable factors could be identified to enable change practitioners and potentially policy makers develop interventions to effectively diagnose lung cancer earlier and impact on lung cancer outcomes. My curiosity for this academic focus started whilst working for the local NHS Cancer Network as a health related behaviour change lead. My role was to design and deliver a change intervention that supported the earlier diagnosis of lung cancer amongst two deprived communities, one in Hull and the other in Goole in the East Riding of Yorkshire, which had similar lung cancer mortality and smoking prevalence. The change intervention included a campaign to raise awareness of the signs and symptoms of lung cancer amongst targeted practice populations at risk of lung cancer and empower them present to their GP. The other facet of the intervention was to support GPs to think more about lung cancer and its signs and symptoms using educational outreach and also encourage GPs to refer more chest x-rays. The intervention had mixed success with differences between the two pilot sites. One noticeable difference was the variation between chest x-ray referrals between the pilot sites. One pilot site increased chest x-ray referral rates by 20% and the other pilot site remained stagnant and unchanged even though the same educational outreach sessions were delivered to practices. This variation in the intervention outcomes led me to want to learn more about GP referral behaviour and gain a deeper understanding about general practice, its culture and understand what factors may have influenced the variation in the earlier diagnosis intervention.

1.2 Background to chapter

The purpose of this chapter is to provide background information pertinent to the thesis which will focus on the referral and diagnosis of lung cancer in general practice. Lung cancer is a common cancer but often comes with poor prognosis and survival outcomes. Survival rates with lung cancer are very poor. Lung cancer causes 26% of male and 17% of female cancer deaths (Hamilton and Sharp, 2004). Furthermore, the UK has poorer cancer survival rates when compared to other European countries with similar health care systems (Berrino, De Angelis et al., 2007). The poor outcomes are multi-factorial and studies have shown these involve delayed presentation by patients to general practice due to symptom interpretation (Corner et al., 2005) and factors within the primary and secondary care health system (Jiwa et al., 2007). The majority of lung cancer patients present with symptoms to their GP who operate a gatekeeping role for referrals into secondary care. GPs see many patients on a daily basis with what could be interpreted as symptoms of lung cancer involving coughs, breathlessness or fatigue. According to

Cancer Research UK, (2014) approximately 5% of all primary care consultations are for cough and 1.5% of the population consult for fatigue each year. This makes the GP's tasks, which is, distinguishing what symptoms warrant a referral and are attributable to lung cancer and what are due to seasonal or self-limiting illness, considerably more difficult. There is also additional complexity for GPs with patients who present symptomatically and have comorbidities such as chronic obstructive pulmonary disease (COPD) or being a long term smoker.

Much has been done to improve cancer survival rates in recent times with many cancers seeing improved outcomes; however, this has not been the case with lung cancer. The reason for poor lung cancer outcomes is partly due to delay in diagnosis (Richards, 2009). Although recent government efforts to promote early awareness and diagnosis of lung cancer campaigns have been implemented nationally, the interventions have yet to demonstrate improved outcomes. With efforts focusing on early diagnosis, and the spotlight being on pathways to diagnosis, this has led to the National Awareness and Early Diagnosis Initiative (NAEDI) pathway being developed which involves patient and practitioner processes. According to Richards (2009) delays can lead to patients being diagnosed with more advanced disease and thus experiencing poor 1-year and 5-year survival rates, resulting in deaths that may otherwise have been avoided. This in turn focuses the role of patients presenting and GPs identifying and reporting lung cancer symptoms early as an important factor in reducing lung cancer mortality.

1.3 Lung cancer incidence and mortality

There are more than 39,000 new cases of lung cancer in the UK each year and more than 35,000 people die from the condition; more than from breast cancer and colorectal cancer combined. Lung cancer is now the leading cause of cancer death in women (National Institute of Clinical Excellence, 2011). In men, lung cancer is the second most common cancer after prostate cancer, with more than 22,800 new cases diagnosed in the UK in 2008. More than 17,900 women were diagnosed with lung cancer in the UK in 2008, making it the third most common cancer in women after breast and bowel cancer (Cancer Research UK, 2011). Little improvement in mortality rates has occurred for lung cancer compared to other cancers such as breast cancer. Only about 5.5% of lung cancers are currently cured. Although this is rising slowly, the rate of improvement has been slower than for other common cancers. According to the National Institute of Clinical Excellence, (2011) outcomes in the UK are worse than those in some European countries and North America.

1.3.1 The incidence of lung cancer diagnosis - A national perspective (England)

From a national perspective the incidence rates from Table 1.1 obtained from Public Health England shows that the number of new cases in males and females aged 50 or over for England for lung cancer were at 35,927 in 2013.

Table 1.1 - New cancers registered in 2013, England

	Lung Cancer
Number of new cases in males and females aged 50 or over, England (% of all ages)	35,927 (97.5%)
Number of new cases in males, all ages, England	19,944
Number of new cases in females, all ages, England	16,909

(Source: Cancer Analysis System, CAS July 2015 snapshot, Public Health England)

Table 1.2 shows lung cancer mortality for England. This shows gender specific variation between males and females.

Table 1.2 - Deaths registered in 2013, England

	Lung Cancer
Deaths registered in males and females aged 50 or over, England (% of all ages)	27,242 (97.9%)
Number of deaths registered in males, all ages, England	15,245
Number of deaths registered in females, all ages, England	12,559

(Source: ONS Mortality, 2013)

1.3.2 The incidence of lung cancer diagnosis - A regional perspective

From a regional perspective, data from the Northern and Yorkshire Cancer Research Information Service (NYCRIS) is that 431,204 patients were diagnosed with any cancer between 1986 and 2006 in the Yorkshire and the Humber Strategic Health Authority area (YHSHA). Approximately 131,000 people, 2.2% of males and 2.9% of females (2.6% of the population) in the YHSHA area at the end of 2006 were living with a diagnosis of cancer. The area has a population of 5.12 million and covers an area of 15,510 square kilometres. The community includes major cities, such as Hull, Leeds, Sheffield, York, as well as a number of large towns and rural areas with scattered populations, especially in North Yorkshire. It includes both some of the most thriving and some of the most deprived communities in the country. It is important that we clarify what is meant by thriving and disadvantaged communities. The definition of a thriving and disadvantaged community takes multiple social and environmental factors into account. According to UK Regeneration, 2015, thriving communities involve key ingredients such as quality building stock, low unemployment, housing ownership, affluent population, community ambition and aspiration, good public transport and road networks. Factors such as higher skilled work force and above average pay could also be factors that contribute to the wider social context that defines a thriving community. In contrast, disadvantaged communities are exposed to low pay, poor quality housing, limited home ownership, site specific location and limited public transport, higher unemployment and have limited access to jobs requiring high skill levels and thus warranting higher remuneration.

1.3.3 The incidence of lung cancer diagnosis - A local perspective

The data for Hull presents some worrying trends and highlights the significant challenges in addressing lung cancer mortality. Table 1.3 presents lung cancer mortality rates for Bransholme, Orchard Park and Greenwood (geographic localities in Hull). These localities have much higher mortality rates than in the rest of Hull with the exception of that of men aged 75+ in Orchard Park and Greenwood (Lung Survey Profile, 2009, NHS Hull). According to the National Cancer Intelligence Network (2014), more than 28,000 people died from lung cancer in England in 2011, significantly less than in 1990 when the figure was almost 32,000. The sharp reduction in the incidence of lung cancer among males is also reflected in the reduction in the male lung cancer mortality rate from 85 per 100,000 in 1990 to 46 per 100,000 in 2011, whereas the mortality rate among females increased slightly from 29 to 30 per 100,000 in this period.

Table 1.3: Gender and age-specific (broad age-groups) lung cancer mortality rates per 100,000 deaths registered 2004-2008

	Lung cancer mortality rates per 100,000					
	Males			**Females**		
	< 65	**65-74**	**75+**	**< 65**	**65-74**	**75+**
Bransholme	299	597	1,087	166	267	664
Orchard Park and Greenwood	357	481	622	95	417	560
Rest of Hull	228	456	800	198	257	352

(Source: Lung Survey Profile, 2009, NHS Hull)

Recent mortality trends show decreasing rates in most types of cancers in people less than 75 years of age. The main exception is in women with lung cancer where mortality rates have increased. The mortality rate appears to have increased over the last five years both regionally and locally (The Northern and Yorkshire Cancer Research Information Service, 2010 (NYCRIS). The cancer e-atlas shows Kingston upon Hull has amongst the highest incidence and the second poorest outcomes of any local authority in the UK for lung cancer (National Cancer Intelligence Network, 2011).

The data in figure 1.1 show incidence rates for Yorkshire and Humber and highlights North Yorkshire and York, North and North East Lincolnshire a near two-fold variation in male incidence rates of lung cancer across the region, which is a reflection of current and historical smoking prevalence.

Figure 1.1 Lung cancer: Mean annual age standardised incidence rate (ASR) 2005-2007

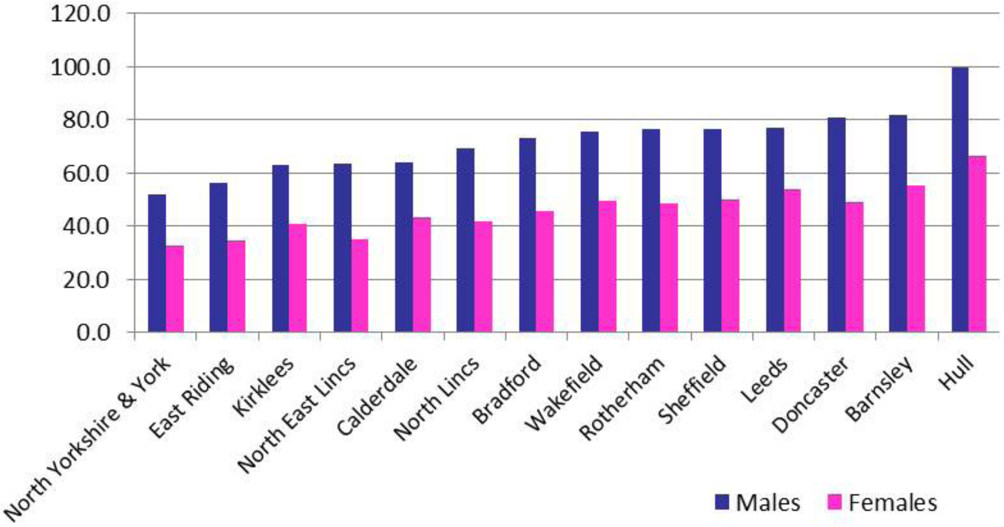
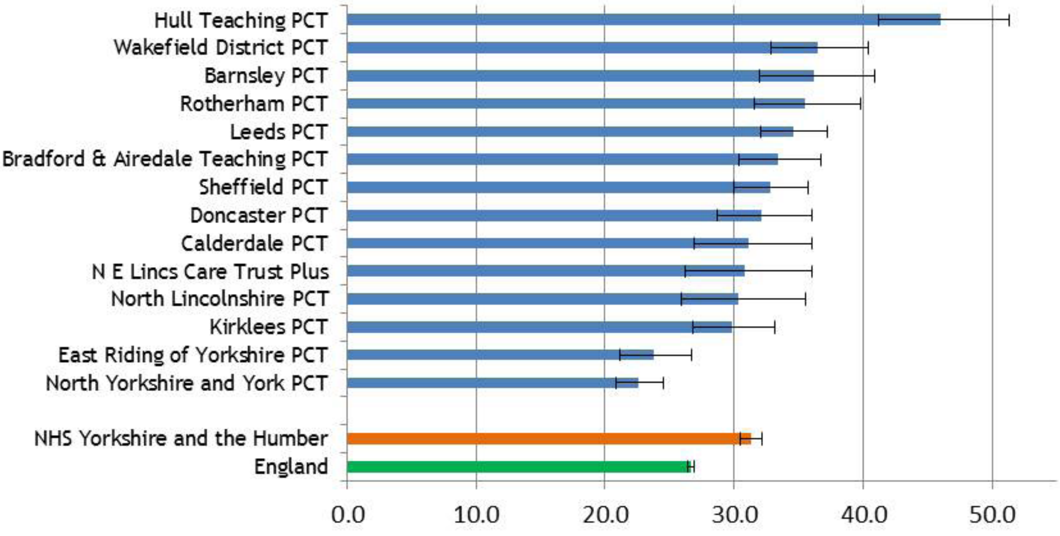


Figure 1.2: Age standardised mortality rate, under 75s: lung cancer (persons) 2005-2007



(Source: Yorkshire and Humber Public Health Observatory, 2010)

The data in figure 1.2 shows the mortality rates for Yorkshire and Humber for lung cancer of 45.8 per 100 000 population, significantly above the England average. North Yorkshire and York and East Riding of Yorkshire have significantly lower mortality rates than the regional average, these Primary Care Trusts have the lowest incidence rates. Hull has a mortality rate significantly above the regional average.

1.4 The modifiable and non-modifiable causal factors of lung cancer

The development of lung cancer has been attributed to several environmental and lifestyle factors of which cigarette smoking is the most important. There are other factors that have been cited to increase the risk of developing the disease and these include age, genetics diet and being exposed to asbestos, radiation, nickel and environmental tobacco smoke. People who don't smoke can also develop lung cancer. It has been estimated that 10-15% of people who get lung cancer will never have smoked (Cancer Research UK). Worldwide it is estimated 15% of men and 53% of women with lung cancer are individuals who have never smoked (Subramanian et al., 2007). Studies indicate that passive exposure to smoking can contribute to 25% of all lung cancers in non-smokers (Alberg et al., 2003).

1.4.1 The modifiable factors

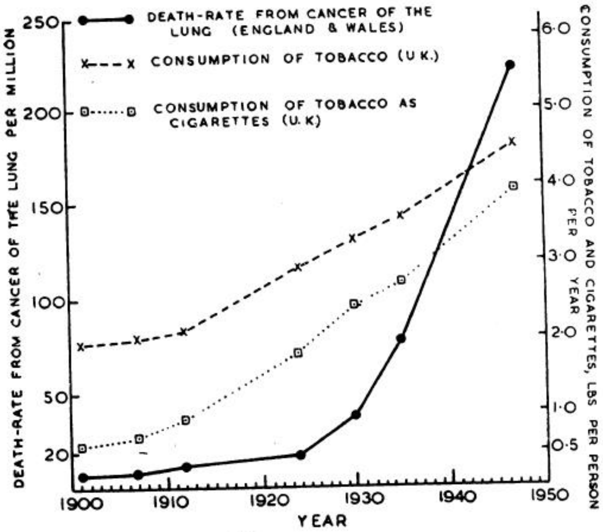
1.4.1.1 Smoking

It is estimated that about 90% of lung cancers are caused by smoking (National Institute of Clinical Excellence, 2011) with factors such as duration and intensity playing a role in its development. It is also more likely to develop in people who start smoking at a young age. Filtered and low-tar cigarettes may slightly reduce a person's risk of developing cancer, but the risk is still far greater than that of a non-smoker.

The seminal work by Richard Doll and Bradford Hill in the 1950s confirmed the association between smoking and carcinoma of the lung. This relationship was summarised and the trends in this country are given in Fig1.3 and show the increase in deaths attributed to cancer of the lung has been much greater than the increase in tobacco consumption.

The smoking prevalence in Hull in 2007 was 40% higher than in England in 2006 and 45% higher in the whole of Yorkshire and Humber Region in 2006. There was wide variation by electoral ward, ranging from 19% to 50% in men and 13% to 79% in women. There was a strong association between age-adjusted smoking prevalence and local deprivation quintiles, 47% of men and 49% of women in the most deprived quintile smoked, compared with 25% of men and 20% of women in the least deprived (NHS Hull Lifestyle Report, 2007). Causal factors for such poor outcomes are intrinsically linked to the very high smoking rates within identified localities across Hull (see Table 1.4).

Figure 1.3: Death rates from cancer of the lung and the rate of consumption of tobacco and cigarettes



THE RATES ARE BASED ON 3 YEAR AVERAGES FOR ALL YEARS EXCEPT 1947.

Death rate from cancer of the lung and rate of consumption of tobacco and cigarettes.

Table 1.4: Age and gender-specific percentages of smoking in Hull.

Gender and area		**Smoking prevalence (%)**				
		Age group (years)				
		18-24*	25-44	45-64	65-74	75+
Males	Bransholme	45.5	44.4	61.5	36.4	20.0
	Orchard Park and Greenwood	68.8	56.4	43.8	27.3	42.9
	Rest of Hull	41.1	37.3	29.5	22.5	16.5
Females	Bransholme	46.2	57.1	60.9	23.1	40.0
	Orchard Park and Greenwood	43.5	79.1	56.3	46.2	62.5
	Rest of Hull	32.3	31.1	26.8	20.0	10.2

(Source: NHS Hull Lifestyle Report, 2007)

1.4.1.2 Asbestos

People who have been in prolonged or close contact with asbestos have a higher risk of developing lung cancer, especially if they smoke. Asbestos and tobacco smoke act together to increase the risk. Many people have been in contact with asbestos during their working lives. Low-level exposure increases the risk of lung cancer only slightly (compared to the risk from smoking), while heavy exposure may result in a much higher risk. (Cancer Research UK 2011, Macmillan Cancer Support UK, 2011). Mesothelioma UK, (2016) suggest that exposure to asbestos is responsible for up to 9 out of 10 mesothelioma cases inferring there is associated risk if people have been exposed to asbestos dust or fibres. The disease has been described in medical literature since 1870 although the first suspicion linking asbestos and mesothelioma did not appear in the UK until 1935 and a definite link was not reported until 1960. According to Mesothelioma Cancer Alliance (2016) there are six different types of asbestos that have been identified. These types are divided into two groups: Serpentine – This variety of asbestos has a layered structure and curly fibers. Chrysotile asbestos is the only type in this category and was the kind of asbestos most often used in buildings. Amphibole – This kind of asbestos is characterized by a long chain-like structure of fibers that are sharp and straight and easy to inhale. This category is comprised of the remaining five types of asbestos: amosite, crocidolite, anthophyllite, tremolite, and actinolite. Amosite and crocidolite were widely used in products until the 1980s and amosite is recognized as the second most likely type to be found in buildings. Some types of asbestos can often be defined by their different colour, white being chrysotile, brown being amosite, blue crocidolite.

1.4.1.3 The association between deprivation and lung cancer

According to Riaz et al. (2011), the difference in the incidence of lung cancer in urban and rural areas and between socioeconomic groups can most likely be explained by the difference in smoking patterns as a higher prevalence of smoking is often found in urban and socially deprived areas. There is evidence to support a link between increasing mortality and increasing deprivation, especially in lung cancer where mortality rates showed a marked difference between the most and least deprived (Figure 1.4). Hull sits in category 5 – the most deprived with an Age Standardised Ratio of 2.4 for men and 2.7 for women of cancer incidence by deprivation 2000-2004 NCIN data. (LUCADA)[1]

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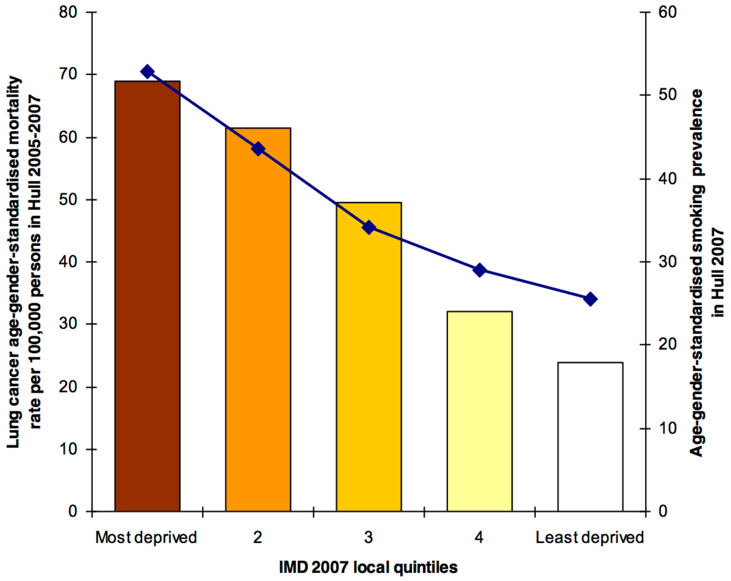
[1] LUCADA is a national audit supported by the Healthcare Commission and the Department of Health and delivered in partnership with the Royal College of Physicians. The audit is designed to provide the first ever comprehensive collection of interventions, enabling comparative assessment of activity, performance and outcomes in lung cancer and mesothelioma.

Outcome in lung cancer is inextricably linked to stage at patient presentation. In general, patients are sometimes diagnosed with lung cancer at too late a stage for it to be operable. The reasons for this late diagnosis are complex and may involve patients presenting late due to lack of health and symptom awareness, fear and perception of cancer. The National Lung Cancer Audit Database (LUCADA) data specific for Hull demonstrate that over 41% of patients present with an inoperable disease (stage IIIb and IV) compared to 31.5% of all other localities across England.

Figure 1.4: Hull lung cancer mortality (bars), smoking prevalence (line) by deprivation quintiles.



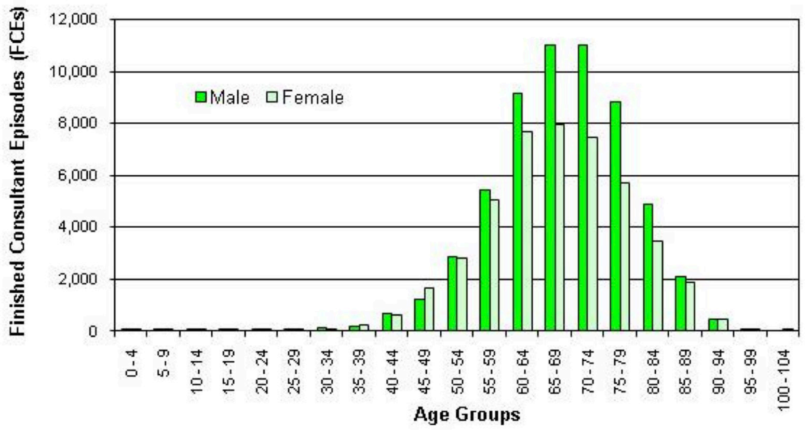
(Source: Lung Cancer Survey Profile, NHS Hull, 2009)

1.4.2 The non-modifiable factors

1.4.2.1 Age

Like most types of cancer, lung cancer is more common in older people. About 80% of lung cancers are diagnosed in people over 60 (Cancer Research UK, 2013). Figure 1.5 shows the age distribution of lung cancer for males and females.

Figure 1.5: Finished Consultant Episodes (FCE) by age for Lung cancer in 2009-10.



(Source: Hospital Episodes Statistics, 2011)

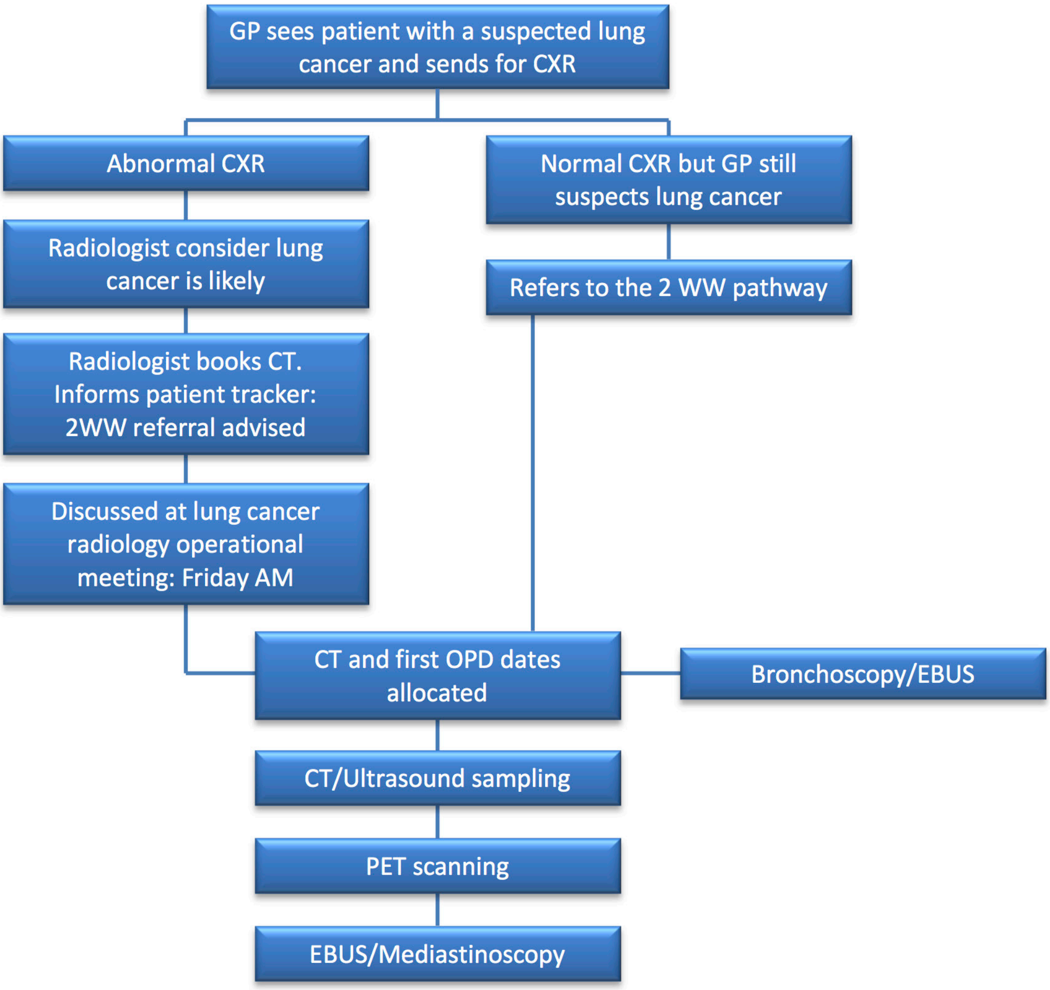
1.4.2.2 Genetics

According to Macmillan Cancer Support UK (2011), people with a close relative who has had lung cancer may be at an increased risk of it themselves, although the increase in risk is very small.

1.5 Lung cancer process to diagnosis

A patient who presents with symptoms suggestive of lung cancer should be referred to a team specialising in the management of lung cancer, depending on local arrangements (National Institute of Clinical Excellence, 2011). Urgent referral for a chest X-ray (CXR) should be offered when a patient presents with: haemoptysis, or any of the following unexplained or persistent (that is, lasting more than 3 weeks) symptoms or signs: cough, chest/shoulder pain, dyspnoea/breathlessness, weight loss, chest signs, hoarseness, finger clubbing, features suggestive of metastasis from a lung cancer (for example, in brain, bone, liver or skin), cervical/supraclavicular lymphadenopathy (Lung Cancer NICE Clinical Guidelines 121, 2011, p. 9).

Figure 1.6: Local referral and diagnostic phase of a lung cancer pathway.



(Source: Don't be a Cancer Chancer Information booklet for General Practitioners, The Humber & Yorkshire Coast Cancer Network, 2009)

1.6 Definitions of general practice terms

General practice is a term used extensively in the UK and in some other countries, but it is not ubiquitous (Starfield, 2009): it is, therefore, one of a number of terms used in this thesis that need clarifying. For the purpose of this thesis, the term general practice refers to family medicine, family practice, primary care practitioners and doctors in a frontline health care systemwho provide prevention, referral, diagnosis and care within a primary care setting to individuals and families within their local practice population.

1.7 A general practice context

The task of the general practitioner is to provide personal, primary, preventive and continuing care to individuals, families and a practice population. Starfield (2009), states "family medicine (general practice in most countries) is person focused, not disease-focused; i.e., the rationale for the discipline is based on the health of people and populations, not the one-by-one counting of diseases, their diagnosis and their management".

Box 1.1: The facets of primary care

- *First contact care,* which requires accessibility and responsibility for reducing unnecessary specialist care,
- *Person-focused care over time* delivered by the patient's chosen physician, who assumes responsibility over long periods for all health care,
- *Comprehensiveness of care,* and
- *Coordination of care* when people have to go elsewhere for problems outside the competence of the primary care practitioner.

(Adapted from Starfield, 2009, p. 7)

General practice has to deal with uncertainty due to the complexity of the primary care environment and working at the coal face dealing with variation in patient presentations and the sheer volume of patients with illness. As Fraser (1999, p. 22) points out, "general practitioners have to be prepared to tolerate a greater degree of uncertainty because of the frequency with which they need to use time in both diagnosis and management". The inferences from this statement highlight the importance of the diagnostic ability of GPs and the management of the patient within the constraints of a consultation. According to McWhinney (1975) the most distinctive attribute of the GP is more the 'commitment to people' than to a body of knowledge or a branch of technology. According to Fraser

(1999, p. 19), McWhinney was at pains to point out that the term ‘commitment to people’ went beyond having an interest in, or concern for people, attributes which all clinicians, whether in hospital or general practice should possess. As described by McWhinney and cited by Fraser (1999, p. 19), the doctor who has commitment to people finds that “problems become interesting and important not only for their own sake but because they are patient’s problems and very often in such relationships there is not even a very clear distinction between medical problems and a non-medical one”. This highlights the complexity of general practice with regards doctor-patient relationships within the consultation and the navigation and deduction of individual presentations and patient narratives. As Atkinson et al. (2011, p. 178) point out these can involve:

- Low prevalence of serious disease; high levels of illness and ‘non-cases’
- Disease manifestation in the community (versus hospital)
- Uncertainty resulting from undifferentiated problems, early presentation
- Complex disease because of co-morbidities and multiple problems
- Working in isolation in a single consultation room
- Lack of time to diagnose and to reflect
- Access to diagnostic tests and altered functioning of tests in community setting
- Continuity and knowing patients can lead to representative bias or following of social rules (e.g. avoiding physical examination).

This is further summarised by Fraser (1999) who draws on the key points to describe general practice:

- General practice is the level of care that lies between self-and hospital care
- Although patient illness behaviour is influenced by a large number of factors, the decision to consult a general practitioner is governed more by cultural and psychological factors than physical symptoms of disease
- The doctor must try to discover the particular reason or reasons for each patient’s decision to consult
- The symptoms patients present to their general practitioner tend to be unorganised or undifferentiated, while those encountered in hospital tend to be medicalised and more differentiated
- The range, type, severity and frequency of problems encountered in general practice are very different from those encountered in hospital
- In making clinical judgements about likely diagnoses and appropriate management plans, account must be taken of the particular context of the clinical task and its associated probabilities

- Whatever the clinical context, clinicians must master both scientific and humanitarian aspects of the practice of medicine.

(Adapted from Fraser, 1999, p. 22)

As Atkinson et al. (2011, p. 179) state, “the general practitioner focuses attention on a number of factors during the consultation, looking to see what is ‘normal’ and what is not. Immediate factors such as the presenting symptoms and signs, patient behaviour during consultation and narratives of daily life are integrated with the doctor’s knowledge of the patients and their families, and the patient’s use of the health care system”.

1.7.1 The responsibility of general practice in the recognition and referral of suspected lung cancer

According to the current European definition, GPs provide ‘comprehensive and continuing care to every individual seeking medical care’ and are ‘normally the point of first medical contact within the healthcare system, providing open and unlimited access to its users, dealing with all health problems (Cox 2006). Most people with cancer present with symptoms and the majority of these presentations are to their GP in primary care. Though a new cancer diagnosis is relatively rare, it is estimated that a full-time UK GP will have a new cancer diagnosed in one of his or her patients each month (Hamilton, 2009) and for lung cancer a GP would typically expect to encounter a new lung cancer approximately once every 8 months (Hamilton and Sharp, 2004). GPs have a level of responsibility for the referral and diagnosis of lung cancer. They have an important role in managing and maintaining the UK public’s health and wellbeing through recognition, diagnosis and gate-keeping mechanisms, and also the management of referrals.

It is estimated GPs make more than 9 million referrals to hospitals for elective (planned) care each year (Hospital Episode Statistics, 2008). It could be argued the GP gatekeeper role and the management of sparse healthcare resources have become increasingly diluted over time. Whilst the Royal College of General Practitioners argue for the importance of GPs as highly skilled, generalist ‘gatekeepers’ of the NHS and who manage risk and deal with uncertainty there is a changing health service landscape where people present to walk-in centres, A&E and community pharmacy which would suggest that GPs can no longer claim they play the NHS ‘gatekeeper’ role exclusively.

1.8 An NHS context to cancer recognition and referral

Whole system service change has been developed and applied to improve quality of care and influence patients' health outcomes. These changes involve patient pathway developments in primary and secondary care through to the commissioning of new consumer-driven services and the decommissioning of non-fit for purpose service provision. Variation in patient outcome exists across the UK due to a variety of factors which can include the following: referral and system processes; individual characteristics; cultural and social demographics.

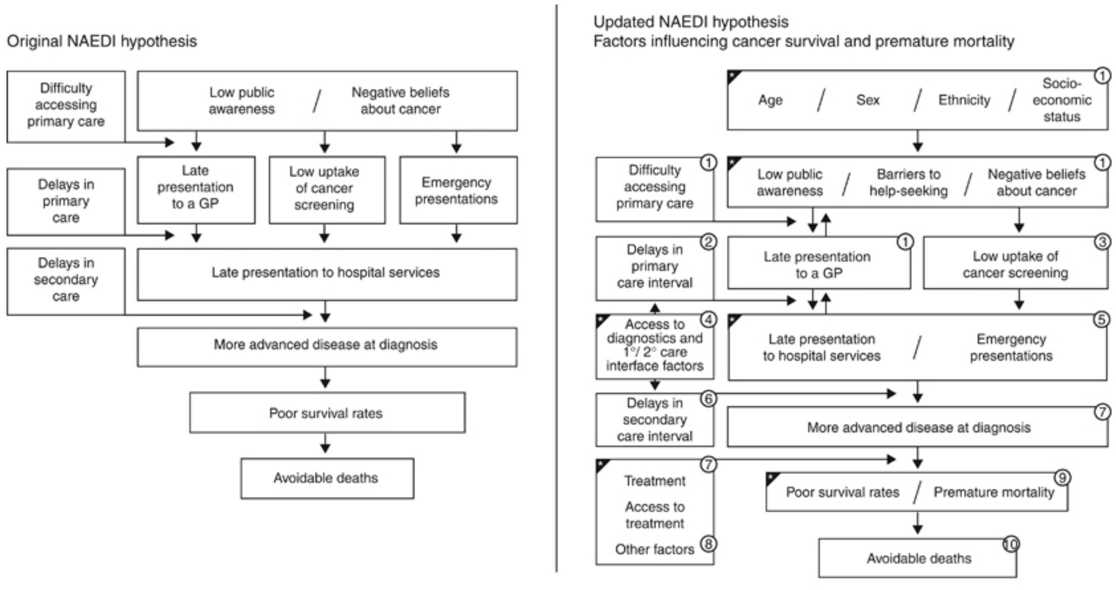
To improve the outcomes in cancer the National Awareness and Early Diagnosis Initiative (NAEDI) was launched in November 2008 and is a key initiative as a result of the Cancer Reform Strategy from 2007. The Cancer Reform Strategy produced by the UK Department of Health builds on the progress made since the publication of the NHS Cancer Plan in 2000 and sets a clear direction for cancer services over a five year period.

1.8.1 National Awareness and Early Diagnosis Initiative Pathway (NAEDI)

The National Awareness and Early Diagnosis Initiative (NAEDI) was launched in November 2008 and was a key initiative as a result of the Cancer Reform Strategy from 2007 (Department of Health, 2007). Although significant progress has been made since the Cancer Plan (Department of Health, 2000), public awareness of cancer symptoms remain poor (Robb et al., 2009), delays in primary care still exist and diagnosis of late disease is common. NAEDI seeks to address these challenges as it is estimated that nationally the programme could save 5000 avoidable cancer deaths (NHS, England, 2010).

The government's Cancer Reform Strategy (CRS) from 2007 included several components to facilitate early diagnosis. A number of these components involved efforts to improve primary care. These efforts have led to developments in understanding delays in referrals which have led to the production of the NAEDI hypothesis (see Figure 1.7). Figure 1.7 highlights the original hypothesis (on the left) and the updated hypothesis (on the right) and covers a whole system approach as it includes delays occurring within primary care. According to Richards (2009) these may occur for a variety of reasons, including failure to consider cancer as a possible diagnosis and having inadequate access to diagnostic tests to confirm or exclude cancer as the underlying cause of a patient's symptoms. Further delays following referral to specialist services have also been well documented in the United Kingdom, with major efforts being made to streamline services to achieve defined waiting time targets.

Figure 1.7: The Original NAEDI hypothesis and supporting new NAEDI hypothesis



(Source, adapted from Hiom, 2015)

1.9 The theoretical aspects to cancer presentation and recognition

In evaluating the theoretical underpinning regarding the processes leading up to cancer diagnosis, both patient presentation and the recognition of cancer by practitioners must be considered. Much of the literature on presentation is framed in terms of patient behaviour or help-seeking and whilst there is a vast literature on illness behaviour, the majority of knowledge is based on a number of early seminal studies. With this in mind, this section aims to review key seminal studies that have sought to establish a theoretical perspective and understanding of the phases of illness behaviour and the stages, periods or intervals of delay within the process leading to cancer diagnosis. While these studies have been instrumental in improving our understanding of the many aspects of cancer recognition and presentation, their key importance relates to how they have advanced understanding of the health-related behaviours of individuals, and how wider social and physiological factors interplay with individual health beliefs and have an impact on their presentation.

1.9.1 A historical introduction to illness behaviour

The social and physiological phenomenon of ‘illness behaviour’ was defined in a seminal study by Mechanic and Volkart (1961, p. 52), as the manner in which “symptoms are perceived, evaluated, and acted upon by a person who recognises some pain, discomfort, or other signs of organic malfunction". They further examine the variation in behavioural patterns that exists between individuals and why it is that one person may seek medical advice immediately, while another person may choose to ignore the symptoms or not consider seeking treatment at all. The emotional representation of Mechanic and Volkart's original 1961 study with 614 freshman students involved the implementation of a cross-sectional questionnaire with freshman students who were categorised as having high levels of stress, and a high tendency to adopt sick role behaviour. The results present a number of important findings when theorising behavioural delay or presentation; the relationship between persons who possess a strong inclination to adopt the sick role when feeling ill is no guarantee that they will actually visit a physician as within a given period they may not experience any symptoms and thus have no need to adopt the medical-seeking behaviour. As Mechanic and Volkart (1961, p. 58), state,

> "We have attempted to indicate how sociological concepts may be linked to traditional medical concepts in the effort to gain a deeper understanding of illness and the phenomena associated with it. Human beings, even when concerned with symptoms, act under the influence of a variety of norms, values, fears, and expected rewards and punishments - that is, in terms of the costs and rewards offered by the "social role of the sick person." One of the tasks of medical sociology is to trace the connections between such influences and the occurrence of actual and known illnesses in various populations, and thus to reach a more accurate and systematic interpretation of the phenomena involved."

1.9.2 Historical introduction to stages of illness

Within the literature, certain terminology is used by sociologists to describe the demarcation, steps or processes within illness. These are described as "stages of illness", and are not to be confused with definitions related to staging data within cancer which is generally used to determine the severity of the cancer and therefore what possible treatment options are most suitable. However, much of the literature considered uses the phrase 'stages of illness', so for the benefit for the reader 'stages of illness' will be used to indicate demarcation, steps or processes of illness.

The emergence of the emotional paradigm within illness behaviour is examined by Edward Suchman (1965), in relation to the symptom experience stage as part of the development of stages of illness. Understanding the processes of patient decision-making prior to seeking medical care is viewed as an important factor within presentation and diagnosis. The examination and the demarcation of transitional points for decision-making are important if we are to understand the influencing factors that modify behaviour and the impact on individual health outcomes. Suchman (1965), described five stages which patients may go through during an illness episode, representing major transition points involving patients seeking medical care. These stages are:

- The Symptom Experience Stage; the decision that something is wrong
- The Assumption of the Sick Role Stage; the decision that one is sick and needs professional care
- The Medical Care Contact Stage; the decision to seek professional medical care
- The Dependent-Patient Role Stage; the decision to transfer control to the physician and to accept and follow prescribed treatment
- The Recovery or Rehabilitation Stage; the decision to relinquish the patient role. (Suchman, 1965, p. 114)

This demarcation of transitional points are based on an analysis of social patterns within illness behaviour and those involved in the seeking, finding and treatment of medical care. Suchman's study of social patterns moved the concept of illness behaviour forward from Mechanic and Volkart's earlier findings which involved studying the physiological and social constructs within illness behaviour in students. Suchman built on Mechanic and Volkart's work, introducing a number of important additional structural factors, socio-cognitive factors (e.g., attitudes, values, and knowledge), group interaction factors, as well as actual behaviours associated with illness. These micro-conceptual distinctions which include 'shopping' representing engaging multiple sources of medical care, the 'fragmentation of care'(variation in medical practitioners), 'procrastination' (delays in seeking care), 'self-medication' and 'discontinuity' (lapses in treatment) bring together the social constructs in reaching a understanding of the transitional points which the student thinks contribute to the 'delay' paradigm. The development of this framework is based on analysis obtained from a large scale sample from a community survey of health and status, comprising of families residing in a community in New York City. The findings from Suchman provide important theoretical foundations to understanding the demarcation of stages of illness and the behavioural characteristics that interact within stages of delay.

1.9.3 Limitations to stages of illness

It is important to recognise that Suchman's theoretical framework has limitations within the context of cancer diagnosis, as the fourth stage has a limited relationship with diagnosis and the final stage has no significance within diagnosis. Further analysis of a time period between the individual seeking validation of being ill and acting upon recommendations once confirmation and a decision is established would have given the framework further utility. Suchman's conceptual framework creates a foundation and is an early forerunner of models by Safer et al. (1979), Andersen et al. (1995), and Walter et al. (2012), that have followed in understanding pathways and processes leading to cancer diagnosis.

1.9.4 Historical introduction to stages of delay

The definition and conceptualisation of the stages of delay has derived from various theoretical concepts which have examined the physiological and sociological processes of symptom interpretation in patients through to the internal system processes and decision-making of health professionals. The literature examines 'points in time' within a health care setting considering clinical decision-making, referral to diagnostics and administrative pathways. An early conceptualisation of delay is that proposed by Bar-Meir and Davies (1960), and cited by Antonovsky and Hartman (1974), who speak of the different 'periods of delay':

- from the first biological change to the first detectable symptom
- from the first symptom to the appearance of persistent, chronic symptoms
- from chronic symptoms to the first visit to the doctor
- From the first visit to the first visit to a cancer specialist from this first visit to the initiation of appropriate therapy.

(Adapted from Antonovsky and Hartman 1974)

Whilst Bar-Meir and Davies (1960), provide a useful framework for delay, Antonovsky and Hartman (1974), suggest further expansion of this model by basing it on points in time rather than periods consisting of:

- a state of no pathology
- the existence of a pathology which is detectable by professional knowledge and skills available at any given time
- the existence of pathology which is detectable by a layman who is as informed as can reasonably be expected at any time
- the actual definition of a condition by a given person as pathological

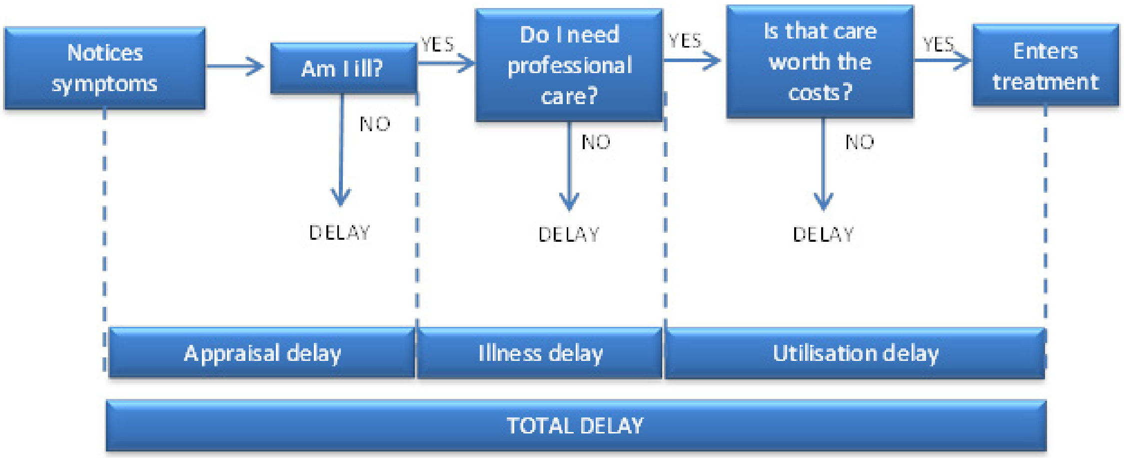
- the first visit to a physician for purposes of inquiry about that condition
- the first visit to a cancer specialist
- the establishment of diagnosis and referral for appropriate treatment
- The initiation of therapy.

(Adapted from Antonovsky and Hartman 1974, p. 102)

Antonovsky and Hartman (1974), argue that this model focuses on the multiple factors involved which determine the movement from one point to another. This early conceptualisation of delay resonates with Andersen et al. (1995), who describe their conceptual processes as comprising "a series of stages, periods or intervals which are governed by a conceptually distinct set of decisional and appraisal processes" (Andersen et al., 1995, p. 34) that create interrelationships across the pathway. These decisional and appraisal processes correlate on each stage along the diagnostic pathway and are measured in time intervals to foster understanding of the extent of delay.

The development of models and factors that influence delay stretches back many decades. An important study by Safer et al. (1979), resulted in the development of a theoretical model of delay, and can be considered a seminal study in the understanding of factors that influence patient behaviour and their decision-making processes. Safer's model was subsequently developed by Andersen et al. (1995), and more recently by Walter et al. (2012), as we will discuss later. Safer et al, (1979) studied factors affecting delay in patients seeking treatment and hypothesised a theoretical model made up of three sequential stages that influence patient delay and within each stage highlighted a range of factors that influence a patient's decision-making processes (see figure 1.8).

Figure 1.8: Decision to seek or delay care in three stages of an illness episode



(Adapted from Safer et al. 1979, p. 12)

The three stages of an illness episode, according to Safer are:

- ‘appraisal delay’: the time the patient takes to appraise a symptom as a sign of illness
- ‘illness delay’: the time taken from deciding one is ill to deciding to seek professional medical care
- ‘utilisation delay’: the time from the decision to seek care until the patient presents to and uses available medical services.

It was posited by Safer that recognition of total elapsed time contained a multitude of factors that affect the length of delay and the decision and processes involved within each stage. Safer also suggests the stages are not entirely independent in nature due to the interrelationship of each stage’s ending with the beginning of another. This point is also made by Antonovsky and Hartman (1974), and relates to the tendency to assume, in many studies, a linear relationship between a given variable and delay, whereas raising the possibility of a curvilinear relationship seems more appropriate particularly in relation to factors such as fear, anxiety and knowledge.

Safer et al. (1979), identified certain factors as predictors of delay which varied within each stage of his model. Within appraisal delay predictors were identified as perceptual or sensory factors and coping strategies with perceptual or sensory factors - such as severity of pain or heavy bleeding. Safer argues that symptoms providing well-defined and strong sensations are more likely to lead to a shortening of the appraisal period.

1.9.4.1 Understanding appraisal delay

Appraisal strategies, as described by Safer et al. (1979), are ways of evaluating symptoms through self-examination, while coping strategies are the actions following the decision that something needs to be done which can take the form of talking to others or trying home remedies. Safer identified three categories called ‘active monitoring’, ‘passive monitoring’ and ‘information seeking’ when considering appraisal strategies. ‘Active monitoring’ includes self-examination of the symptom, trying home remedies, observing the symptom or waiting for it to change. The study by Valins (1966), also posits the importance of the physiological process and that if a change in feelings occurred it would cause individuals to search for information to define the change, this being a form of ‘passive monitoring’ which Safer also reports in his findings. Safer also includes thinking about the symptom and its implications or trying to ignore the symptom and ‘information seeking’.

1.9.4.2 Understanding illness delay

Factors predicting illness delay help to explain whether or not the individual is to seek medical care and whether the arousal of negative emotions and conceptual beliefs about pain and severity start to be considered. Beliefs regarding severity are seen as outcomes of processes within the appraisal stage. Safer and colleagues propose that fear can motivate health behaviour as well as lead to maladaptive avoidance behaviour. Fear of the illness itself may be related to speedier action, but fear of treatment may cause major delays in help-seeking behaviour (Safer et al., 1979).

1.9.4.3 Understanding utilisation delay

The factors that influence utilisation delay are situational and socio-demographic. Situational factors are described by Safer as the complexity in the individual's life setting that interferes with seeking appointments and medical care. Other barriers such as monetary factors due to the high cost of treatment, which may be more relevant in countries where health care is not universal, and unfamiliarity with the medical service and the perception of barriers between the individual and the health professional also compound utilisation delay. These patient and health professional dichotomies are highlighted by Antonovsky and Hartman (1974), and they present the view those institutional mechanisms such as routine, preventive examinations, and sensitivity and knowledgability in the course of a doctor's everyday work have a role to play in early detection.

1.10 Definitions and terminology of delay

The term delay in the cancer literature is used both to refer to time delays and to denote advanced stage at presentation. More recently the word delay is being used less frequently as it appears pejorative, and instead researchers have focused on time to diagnosis (Smith et al., 2009). According to Corner et al. (2005), the term 'delay' is an inappropriate description of health behaviour by patients. Their findings from their study highlighted how patients did not consciously 'delay' in seeking help, as it did not occur to them that they were ill. The lung cancer study by Corner is viewed as important in the understanding of patients with lung cancer and provides insights into patient factors and the understanding of lung cancer symptoms.

Within the study of delay in seeking medical treatment, several definitions of delay have been used with numbers of days being aligned to quantify a time period from detection of the first symptom through to diagnosis and treatment. An early definition of patient delay was proposed by Pack and Gallo (1938), as occurring when the patient waits longer than three months from the onset (i.e., recalled recognition) of a symptom before consulting a physician. Physician delay is defined by Pack and Gallo (1938), as occurring when more than one month elapses between the patient's consultation with the physician and the establishment of diagnosis or referral for appropriate treatment.

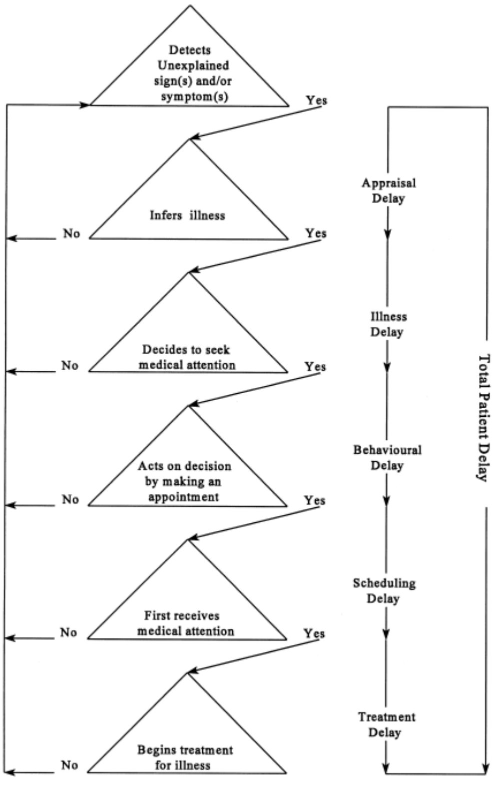
The term delay is used extensively in the cancer literature; however there are a number of contemporary terms and concepts that are also used. In this thesis the term delay and the various concepts of delay including terms such as 'time to diagnosis', 'intervals to treatment' will continue to be used given their extensive usage within the cancer literature. The thesis will therefore continue to use the word delay and its related concepts with reference to the relevant authors in order to retain a clarity and commonality that is understood by researchers within the cancer literature.

1.11 An introduction to contemporary concepts of delay

1.11.1 Model of Total Patient delay

Of particular significance is Andersen's seminal work on stages of delay, advancing the field with a model of Total Patient Delay (Andersen et al., 1995) (see figure 1.9).

Figure 1.9: Model of Total Patient Delay



Source, Andersen et al., 1995, p. 35

Andersen's model comprises further expansion of the Safer model, in which Andersen describes five stages of delay, namely appraisal, illness, behavourial, scheduling and treatment delays, with each being governed by a conceptually distinct set of decisional and appraisal processes which begin with an unexplained symptom through to treatment in secondary care (see figure 1.9). Andersen hypothesised that 'appraisal delay' would account for most of the delay in seeking a cancer diagnosis due to the nature of cancer malignancy and the appearance of cancer symptoms which are often protracted and can be atypical. Verification of this consisted of a study which examined psycho-physiological comparisons of two groups of women seeking diagnostic evaluations of gynaecological and breast cancers. In this study both groups were asked to identify a pair of calendar dates, namely when they had first detected bodily changes, when they had first thought of it as potential illness. Data from both studies reveal that the days during which individuals are making inferences about bodily state and illness account for the majority of delay time. Andersen's results revealed that appraisal delay accounted for significantly more of the total patient delay time than any other component and constituted an overwhelming 79% of the total patient delay in seeking diagnosis of gynaecological cancer. The different gynaecological sites were cervix, endometrium, ovary, vulva and vagina. The mean total patient delay was 97 days, of which 77 comprised appraisal delays. The study comprised 39 women aged 24-75 who met the criteria from referrals to a large tertiary care hospital, who were diagnosed with gynaecological cancer one or two weeks previously and had self-detected their symptoms, presented for medical treatment using their own initiative and subsequently received their cancer diagnosis. The breast cancer study revealed a mean total patient delay of 46 days with appraisal comprising 27 days. This study comprised of 63 women, the majority of whom were white (92%) aged 17-70 years who had self-detected their symptoms and presented of their own accord. The differences between gynaecological and breast appraisal delay does suggest that the process of recognition by patients that their symptoms may need attention will vary for different cancers and symptoms, with symptoms with a more noticeable physiological presence appearing to have a shorter appraisal stage.

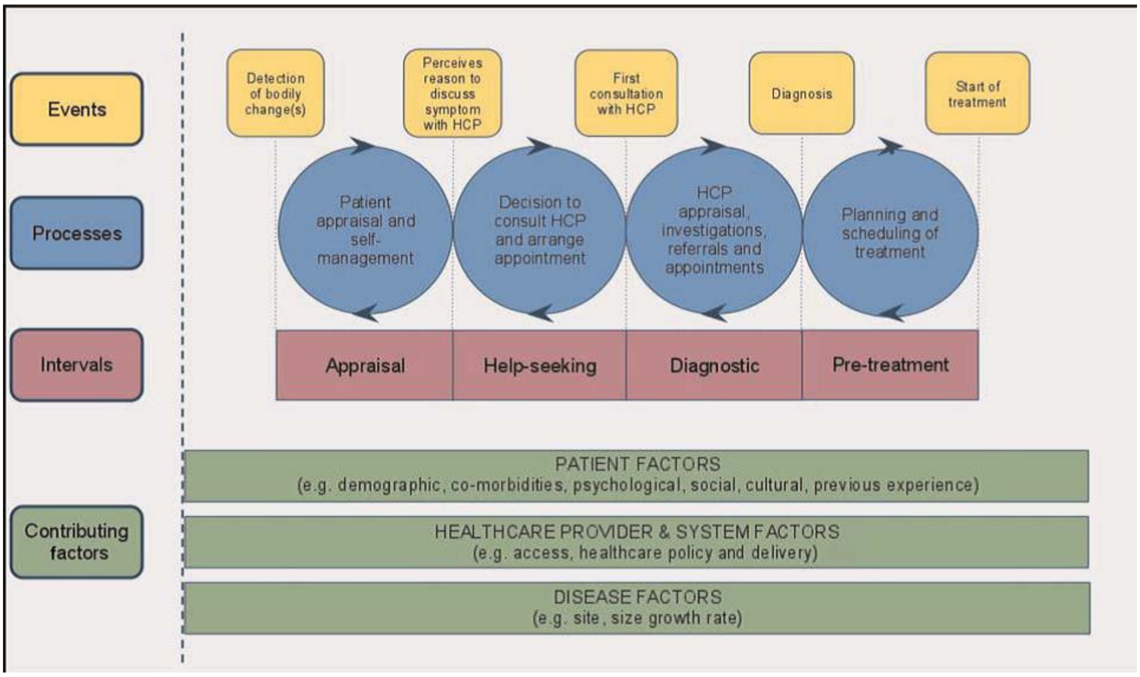
Andersen's view that appraisal delay accounted for the longest period of delay has parallels with the conclusions reached by Safer in his earlier work. Whilst Safer concludes that within appraisal delay, sensory factors such as ambiguous pain and passive monitoring strategies and information gathering of symptoms are predictors of increased appraisal delay, strong unambiguous sensory factors associated with severe pain and bleeding were associated with reduced appraisal delay. Andersen et al. (1995), postulate that the motives for this explanation of symptom delay are fear, anxiety, unexpectedness, salience in which this was defined as a mean between four ratings of 'painful', 'noticeable', 'attention getting' and 'difficult to ignore' and its perceived consequence.

1.11.2 Model of Pathways to Treatment

Walter et al. (2012), advanced the debate on total patient delay with their recent systematic review of applicability in cancer diagnosis and proposed further refinements to the model of total patient delay (see Figure 1.10). The study was a systematic review of the applicability of Andersen Model of Total Patient Delay in cancer diagnosis. A narrative synthesis using four electronic databases was conducted. This work recognised the subtle differences between Safer's original model and the Andersen Model: while Safer et al. used 'stage' to describe the delay time, Andersen et al. used 'stage' to describe not only the delay time but also the components of delay or phases of decision-making. This inconsistency is highlighted by Walter's analysis of the literature on delays in cancer diagnosis in which she concludes that there is a lack of consensus regarding the definitions and terms used, but also on time intervals measured along the diagnostic pathway.

The key finding from the review acknowledges that there are clear and identifiable stages between the detection of a symptom, first presentation to a medical practitioner, diagnosis and the initiation of treatment. The review highlights the importance of appraisal delay as defined by Andersen's model, which is number of days elapsed from when a person first detects an unexplained symptom until the individual concludes they are ill. This review highlights the difficulty in distinguishing between illness delay and appraisal delay. This is because patients may immediately interpret a symptom as being significant (e.g. breast lump); however, this then opens the debate of whether only well-defined physiological aspects that reflect some tumour-specific cancers would fit more appropriately across Andersen's model. Conversely, Corner et al. (2005), found vagueness of symptoms and the lack of recognition of any health related problems which created a sizeable delay within what Corner describes as appraisal delay. This would suggest that the concepts of appraisal delay and illness delay need further development and clarification with respect to lung cancer.

Figure 1.10: Model of pathways to treatment



(Adapted from Walter et al., 2012, p. 9)

1.11.3 Does time to diagnosis matter?

There is a large body of evidence within the literature that examines the patient cancer journey and whether the concept of delay and the length of time to diagnosis and treatment are associated with poorer outcomes. The literature is varied in its findings which creates limitations due to studies being associated with one cancer type. However, the recent systematic review by Neal et al. (2015) aimed to review all cancers and examine if shorter times to diagnosis were an influencing factor with more favourable outcomes. The study, which encompassed many tumour sites, concluded that it is appropriate to assume that efforts focusing on speedier action in the diagnosis of symptomatic cancer have merit and favourable outcomes such as improved survival, earlier stage diagnosis and quality of life for patients. However, there is a caveat and it is important to highlight that these favourable outcomes varied depending on tumour site. One such tumour site that had mixed findings, and is the focus of this thesis, was lung cancer. Neal highlights that the studies included in their review for lung cancer were evenly split in reporting positive, negative and no association between diagnostic intervals and outcome. This leaves lung cancer in an unclear position and calls into question whether efforts to focus on a speedier diagnosis have real merit. With these varied findings it is difficult to conclude how diagnostic intervals influence lung cancer outcomes. One possible explanation that may be considered is the nature of how some lung cancer symptoms present to primary care. Patients may present with symptoms that are too vague or with multiple symptoms that represent other respiratory conditions such as COPD or seasonal variations such as coughs and colds. This may be difficult to differentiate between something less serious or more sinister and thus not give a true representation of the interval stage within the diagnostic journey. This explanation is supported by Corner et al. (2006) whose retrospective study examined patient factors and delay and concluded patients did not consciously delay in seeking help as they were unaware they were ill as the symptoms were not associated with illness and viewed as part of the normal course of life and getting older.

1.11.4 Summary

Walter proposes some noticeable refinements to Andersen's Model. The first change combines appraisal and illness delay to create the 'appraisal interval'. Start and end-points are clearly defined to describe the time interval from detection or awareness of bodily change. The second, which is the combination of behavioural delay with scheduling delay to become the 'help-seeking interval', enables a time interval for perceiving a reason to discuss symptoms with a health professional to first consultation. The third, the 'diagnostic interval', is between first appointment with a health professional and a formal cancer diagnosis being made, and finally the 'pre -treatment interval' is found between formal cancer diagnosis and initial treatment. This revised model demonstrates clear demarcation points for the beginning and end of each interval and Walter argues that her revised model is generalisable across symptoms and across cancer sites. The Walter model of pathway to treatment (see figure 1.8), which is a contemporary expansion of Andersen's 'Total Patient Delay', highlights the importance of patient appraisal and demonstrates the inter-relational aspects between patient factors and disease factors within the intervals. This allows for a non-linear direction and where periods of re-appraisal and re-scheduling may occur because of the individual characteristics of tumour sites and the diversity of population groups. According to Walter et al. (2012), there is a lack of consensus not only on the definitions and terms used regarding delay but also of the time intervals measured along the diagnostic pathway. Walter concludes that this lack of consensus may be because most research into symptom appraisal and patient pathways has lacked a theoretical framework. By applying a theoretical framework to study delay in cancer diagnosis the development of future interventions may reduce patient time to presentation, diagnosis and cancer treatment. Walter argues that few theoretical frameworks have been applied within the majority of empirical studies on diagnostic delay in cancer due to the lack of census on definitions of delay but also the measurement of the time intervals used along the diagnostic pathway. This may seem contradictory due the empirical nature of most studies but having a theoretical framework can provide a rigorous approach to the development of a hypothesis for future interventions. The findings from Walter highlight the importance of understanding factors that affect patient delay as this will enable researchers and policy makers to better understand the decision-making processes of both patients and also GPs, leading, perhaps, to the development of future policies and strategies that can have an impact on wider health outcomes.

1.12 Aims of the research

The aim of this research study is to identify factors influencing GPs in the recognition and referral of suspected lung cancer. The overall purpose was to identify potential modifiable factors in order to develop a hypothesis for testing which will inform future interventions to enable GPs recognise and refer patients with lung cancer effectively and appropriately. To achieve this, the enquiry aims to gain a deep understanding of general practitioners and develop and explore a range of potential modifiable factors that influence general practitioners in the recognition and referral of suspected lung cancer.

1.13 The 'gap'

The approach taken in this study is to explore and unearth the factors that may influence GPs in the recognition and referral of suspected lung cancer. It aims to answer one question: What are the factors that influence GPs in the recognition and referral of suspected lung cancer? By using two different methods, in-depth interviews and think aloud, to answer the research question the study aims to help fill the current evidence gap on identifying factors that influence GPs in the recognition and referral of suspected lung cancer. It proceeds by further investigating and answering the following questions:

- What are GPs perceptions and understandings about the recognition and referral of suspected lung cancer?
- What practice-related factors do GPs perceive as having an impact on the recognition and referral of suspected lung cancer?
- What individual characteristics do GPs perceive as having an impact on the recognition and referral of suspected lung cancer?
- How do GPs consider the possibility of lung cancer and what actions may ensue from this consideration?
- What are perceived by GPs as the facilitators and barriers to the recognition and referral of suspected lung cancer?

- How do GPs perceive that lung cancer recognition and referral could be enhanced in primary care?

The failure to address these questions and to introduce potential modifiable factors for further testing and verification may result in not fully understanding the environmental and contextual paradigms which could impact on the referral, recognition and diagnosis of lung cancer. It is important that the study establishes and fully utilises any new knowledge and insights that may contribute to or shape future cancer developments, commissioning and government policy for primary care. The exploration of influential factors about lung cancer recognition and referral from a general practice perspective is viewed as exploratory due to the dearth of research in this field.

Chapter 2

Literature review part 1

2.1 Introduction to chapter

There are two separate components to the literature review and these are presented in this and the next chapter. The first of these (this chapter) will focus on factors influencing general practitioners (GPs) and cancer referral and diagnosis and consider the theoretical models that underpin cancer diagnostic pathways, while the second (Chapter 3) will explore and seek to understand GP decision-making behaviour and examine the potential relationships between decision-making and cancer diagnosis.

2.2 The aims of the literature review

The overall purpose of both chapters of this literature review is to understand factors impacting on the role played by GPs in the recognition, referral and diagnosis of cancer with particular emphasis on lung cancer. Though the focus is on factors related to GPs and their practice, the pathway to diagnosis for lung cancer can often be complex with issues relating to patient presentation interacting with those of GPs and those within secondary care. With this in mind the evidence gathered from the available literature regarding the factors impacting on GPs and on cancer recognition and referral will be presented within the context of the pathway to diagnosis for patients with lung cancer.

This thesis will accordingly begin with examining and the consideration of the factors contributing to and influencing patient presentation, before moving on to explore factors that potentially influence GPs, with the end of the chapter examining the evidence for presentation and recognition with respect to lung cancer.

This literature review intends to address two aims:

1. To outline the knowledge and evidence of factors impacting on recognition and referral of cancer with a specific focus on lung cancer within general practice, and the potential interplay within the cancer diagnosis pathway
2. To explore the literature related to medical decision-making in general practice and explore aspects of general practice related to cancer recognition, referral and diagnosis (this will be presented in Chapter 3).

2.3 Parameters of the literature review

There is a large body of literature concerned with the diagnostic pathway for patients with cancer, and therefore it is appropriate to consider which parts of that literature is relevant to explore and present within this literature review. The review will consider studies that have investigated cancer presentation and recognition, factors related to cancer delays and all aspects of presentation of lung cancer, and the literature that explores and examines GP behaviour and the factors that influence their behaviour and decision-making related to cancer.

The literature review will examine evidence described within the parameters; however, due to practicalities and the lack of resources for translation, all non-English language studies will be excluded from this review.

2.4 Search strategy

A search strategy was used in order to ensure a systematic process to obtain relevant literature from appropriate databases. The approach to this literature review is narrative in nature. However, there has been a rigorous approach to examining the literature using a protocol to help shape the process for gathering relevant literature related to the student's subject area.

The following databases were searched via medical and social science databases: MEDLINE, EMBASE. Manual searches were also conducted of identifying National and International Governments Health Departments and Cancer charities reports and conference materials. The search strategy reviewed literature from 1980 up until the present day. Search terms used include: cancer, primary care, family pract#, general pract#, delay#, diagnosis, lung cancer, medical decision making, clinical decision making. To reduce the volume of literature search strings were created using the following frameworks:

1. primary care OR general pract# OR family pract#
2. delay OR Diagnosis
3. Cancer AND 1
4. 2 AND 3
5. 1 AND medical decision making
6. 1 AND clinical decision making
7. 2 AND 5
8. 3 AND 6

These include the following:

- Studies of cancer tumour sites and include breast cancer, bowel cancer, head and neck cancer and include time to diagnosis, medical decision-making, GP differences and characteristics and patient characteristics.

- Studies of lung cancer that include time to diagnosis, medical decision making, patient characteristics, patients experiences,
- Studies of GP's characteristics and individual differences in the recognition and referral of lung cancer
- Studies of organisational culture in primary care.

Study outcomes may include mortality, survival, diagnostic referral, time to diagnosis, medical decision-making: study outcomes will, however, vary within each of the factors unearthed in the review. The subjective experiences of participants (GPs) and patients with regards causes of cancer delay and barriers for earlier presentation are to be included. Subjective experiences and findings of participants involved in describing the difficulties and the complexities involved in recognition, referral of suspected lung cancer and the clinical decision-making processes that ensue. The review will include the studies that highlight timing from symptom recognition to presentation through to referral and treatment.

2.5 Evaluation and synthesis of identified papers

Table 2.1 highlights key papers that add important contributions to the discussion in examining factors that influence GPs when involved in both a patient encounter and processes involved in the recognition and referral of cancer. Whilst the student has focused as much as possible on GP behaviour it is important to acknowledge that the literature highlights a strong interrelationship between both patient and practitioner. Thus, there will be areas of the literature that overlap from patient illness behaviour which is discussed in detail in Chapter 1, Section 1.9 and highlights contemporary models of delay that have relevance when discussing GP behaviours and what factors influence their behaviours.

Table 2.1 - Table of identified papers

Authors / Year	Study title	Setting / Context	Method / Data collection	Findings
Andersen et al., (1995)	Delay in seeking a cancer diagnosis: delay stages and psycho-physiological comparison processes.	The setting was in Tertiary Care in the US. Two studies on the analysis of patient delay in medical diagnosis.	Examination of psycho-physiological comparisons of two groups of women seeking diagnostic evaluations of gynaecological and breast cancers.	Findings from both studies revealed that the days during which individuals are making inferences about bodily state and illness account for the majority of delay time. Mean total patient delay was 46 days, comprising of 27 appraisal days, 7 illness days, 6 behavioural days and 6 scheduling days.
Ramirez et al., (1999)	Factors predicting delayed presentation of symptomatic breast cancer: a systematic review	International publications	A systematic review	The review demonstrated an association between older age and patient delay, and that delay by patients is unrelated to marital status. The review found moderate evidence of influences attributable to education and ethnicity, but insufficient evidence for that of lower socioeconomic status.
Jiwa et al., (2004)	Less haste more speed: factors that prolong the interval from presentation to diagnosis in some cancers.	The setting was in the UK general practice.	GP records review (all cases with specified common cancers, including lung cancer, diagnosed since 1990).	Six lung cancer cases were included out of a total of 54 cases; mean interval from presentation to diagnosis was 95 days. Only one lung cancer case was included in detailed review. Factors identified included reticence by patients to seek to expedite specialist appointments, failures of communication patients presenting multiple problems in short general practice consultations
Myrdal et al., (2004)	Effect of delays on prognosis in patients with non-small cell lung cancer.	The setting was in Sweden. Two types of delay were studied: (1) symptom to treatment delay, and (2) hospital delay.	Retrospective analyses of Swedish registry data on patients diagnosed with non-small cell lung cancer (NSCLC) over a 5 year period.	Median symptom to treatment delay was 4.6 months and median hospital delay 1.6 months. Older age, advanced tumour stage, and non-surgical treatment were independently related to poor survival. There was an association between a short delay and a poor prognosis which was most pronounced in patients with advanced disease.
Neal and Allgar (2005)	Socio-demographic factors and delays in the diagnosis of six cancers: analysis of data from the 'National Survey of NHS Patients: Cancer'	The setting was in the UK.	Secondary analysis of patient-reported data from the 'National Survey of NHS patients: Cancer' was undertaken.	The findings show the strength of factors varied by each cancer type. For example, colorectal cancer, non-Hodgkin's lymphoma and breast cancer highlight patient characteristics such as age, marital status and ethnicity as key factors in delays. For lung and ovarian cancer none of the factors were significant, for prostate cancer the only significant factor was social class.

Authors / Year	Study title	Setting / Context	Method / Data collection	Findings
Salomaa et al., (2005)	Delays in the diagnosis and treatment of lung cancer	The setting was in Finland in a University Hospital.	A Finnish study of patients who had lung cancer. It was a retrospective study based on 132 patient records..	The median delay in patient presentation from first symptoms to GP appointment was 14 days. GP delay before writing a referral was 16 days and referral delay was 8 days. Median delay from referral to diagnosis was 15 days and treatment delay was 15 days. The median symptom to treatment delay was almost 4 months.
Smith et al., (2005)	Patients' help-seeking experiences and delay in cancer	International publications	Qualitative synthesis (meta-ethnography) of international publications.	Key findings were recognition and interpretation of symptoms, and fear of consultation. Fear manifested as a fear of embarrassment (the feeling that symptoms were trivial or that symptoms affected a sensitive body area), or a fear of cancer (pain, suffering, and death), or both. The patient's gender and the sanctioning of help-seeking were important factors to prompt a consultation.
Corner et al., (2006)	Experience of health changes and reasons for delay in seeking care: A UK study of the months prior to the diagnosis of lung cancer.	The setting was two Hospitals in the UK.	Qualitative interview study – Events recalled prior to diagnosis with 22 individuals recently diagnosed with operable (early stage) and inoperable (late stage) lung cancer.	The findings suggest patients did not attribute their symptom changes to ill health or acknowledge that the symptoms were abnormal and were often bound up in everyday living.
Macdonald et al., (2006)	Systematic review of factors influencing patient and practitioner delay in diagnosis of upper gastrointestinal cancer.	International publications	A systematic review including extensive searches of the literature published from 1970 to 2003.	The findings include patients' factors involving symptom interpretations, and in particular their failure to interpret their symptoms as potentially serious or the recognition of the presence of the symptom. Other factors involving perceptions of the seriousness of symptoms which were based on family history, values and beliefs, experiences and lower socio-economic status were also associated with an increase in delay

Authors / Year	Study title	Setting / Context	Method / Data collection	Findings
Daly and Collin (2007)	Barriers to early diagnosis of cancer in primary care: a needs assessment of GPs.	The setting was Irish general practice.	The study involved 47 GPs in focus groups and a national survey with 929 GPs in Ireland.	Findings include the challenges and barriers faced by GPs. They found the principle barriers identified were not confined to early diagnosis but applied to the diagnosis of cancer at any stage. They conclude that there was a lack of direct access to diagnostic tests, difficulties with hospital referrals, unclear recommendations for screening, 'poor communication and access to secondary care and the need for further education and clinical practice guidelines'.
Mitchell et al., (2008)	Influences on pre-hospital delay in the diagnosis of colorectal cancer: a systematic review.	International publications	A systematic review reviewing international studies published from 1970 to 2003.	A systematic review on pre-hospital delay in the diagnosis of colorectal cancer which reports the influence of symptom awareness and patients' symptom interpretation as a common theme across all the fifty-four studies included. Non-recognition of the seriousness of symptoms on the part of the patient increased delay as did symptom denial. Patient delay was greater for rectal than colon cancers and the presence of more serious symptoms, such as pain, reduced delay.
Macleod et al., (2009)	Risk factors for delayed presentation and referral of symptomatic cancer: evidence for common cancers.	International publications	Two worldwide systematic reviews of the literature on patient-mediated and practitioner mediated delays.	The findings emphasise the complexity and the multi-factorial reasons that influence outcomes. Predominant risk factor for patient delay was a lack of interpretation of the seriousness of the symptoms. More defined or alarming symptoms, such as bleeding, lump or severe pain, led to a reduced time to presentation. Social networks and social support via family and friends helped patients seek advice or form decisions.
Smith et al., (2009)	Factors contributing to the time taken to consult with symptoms of lung cancer: a cross-sectional study.	The setting was three Scottish Hospitals.	A cross-sectional quantitative interview survey was performed of 360 patients with newly diagnosed primary lung cancer in three Scottish hospitals.	Findings found no substantial relationship between socio-demographic or geographic factors and time taken to present. Over 50% of participants experienced a delay of 14 weeks or more before presenting to a medical practitioner, this being due to symptoms being ignored or not seen as potentially serious.

Authors / Year	Study title	Setting / Context	Method / Data collection	Findings
Molassiotis et al., (2010)	Mapping patients' experiences from initial change in health to cancer diagnosis: a qualitative exploration of patient and system factors mediating this process.	The setting was the UK health care system.	Qualitative interviews with patients diagnosed with cancer were carried out. Seventy-five cancer patients discussed their pre-diagnosis experience as part of a broader exploration of their symptom experience.	Applying the Andersen model as a theoretical framework, Molassiotis established appraisal delay as one of the longest intervals contributing to delayed diagnosis. They also found the misattribution of symptoms by patients to things other than cancer including chronic conditions and the ageing process was also associated with an increase in patient delay. Psychological and attitudinal factors involving denial, avoidance and self-medication were also common features.
Delva et al., (2011)	Factors influencing general practitioners in the referral of elderly cancer patients.	The study setting was French general practice.	This is a cross-sectional study on a representative sample of GPs in Aquitaine, South-West France. Questionnaire items were selected using a Delphi consensus approach and sent by post.	Findings show that the cancer site and organisational difficulties in patient management were significantly associated with the decision to refer elderly patients with early-stage cancer. For advanced stages, oncology training, patient age, organisational difficulties in patient management and stage of cancer were significantly associated with the decision to refer elderly patients.
Hansen et al., (2011)	General practitioner characteristics and delay in cancer diagnosis. a population-based cohort study.	The study setting was Danish general practice.	The study was a population-based cohort study involving a questionnaire and included 334 GPs and their 1,525 newly diagnosed cancer patients.	The findings highlight GP seniority, practice organisation, list size, CME activity, job satisfaction and level of burnout were not associated with delay. Other key findings include patients who attend a GP who has limited knowledge of their patient experienced a shorter system delay. Another finding highlighted the association between female GPs and patients experiencing a shorter delay.

Authors / Year	Study title	Setting / Context	Method / Data collection	Findings
Berglund et al., (2012)	Social differences in lung cancer management and survival in South East England: a cohort study.	The setting was South East England, UK.	Population-based cohort study using the Thames Cancer Registry data in the UK. A total of 15,582 lung cancer patients diagnosed between 2006 and 2008 was identified.	There were no detectable socioeconomic differences in stage at diagnosis among lung cancer patients in South East England between 2006 and 2008. Socioeconomic differences in lung cancer management and survival existed. Inequalities in survival could not be fully explained by social differences in stage at diagnosis, co-morbidity and treatment factors. In early-stage disease, social gradients in survival existed throughout follow-up, whereas in advanced disease, variations in survival were confined to the period immediately after diagnosis.
Walter et al., (2012)	The Andersen Model of Total Patient Delay: a systematic review of its application in cancer diagnosis.	International publications	A systematic review	The vast majority of studies of diagnostic delay in cancer have not applied a theoretical model to inform data collection or reporting. The review acknowledges that there are clear and identifiable stages between the detection of a symptom, first presentation to a medical practitioner, diagnosis and the initiation of treatment. The review highlights the importance of appraisal delay as defined by Andersen's model, which discusses the number of days is elapsed from when a person first detects an unexplained symptom until the individual concludes they are ill.
Neal et al., (2015)	Is increased time to diagnosis and treatment in symptomatic cancer associated with poorer outcomes -Systematic review	International publications	A systematic review	The study found heterogeneity precluded definitive findings but it highlights the cancers that demonstrated associations between shorter times to diagnosis and positive outcomes were breast, colorectal, head and neck, testicular and melanoma.

2.6 Gaps in the literature and rationale for the research presented in this thesis

The literature review has revealed numerous gaps in the research that investigates the recognition, referral of suspected lung cancer in general practice. There is a body of evidence which examines patient, doctor and health system delays and explores the relationship between delay and cancer outcomes. The recent study by Neal et al., (2015) whose systematic review examined the association between increased time to diagnosis and poorer cancer outcomes found heterogeneity precluded definitive findings but highlight cancers that demonstrated associations between shorter times to diagnosis and positive outcomes were breast, colorectal, head and neck, testicular and melanoma. Whilst this does not reflect all cancers it is suggested there is merit to continue efforts to expedite the diagnosis of symptomatic cancer to improve survival and patient's quality of life. However, within the literature there is little known research that examines GPs in-depth on understanding factors that influence the recognition, referral of suspected lung cancer and provides a voice of GPs about the complexity in decision making within a lung cancer context (ibid). It is suggested by the student that further research is required in this area.

The current literature suggests that the recognition and referral of cancer can be complex and difficult. There are many factors that contribute to this complexity which can involve patient's vague symptoms, atypical presentations or the multiple symptoms which make it difficult for GPs to differentiate between the most concerning to the less concerning. In all, these include a plethora of factors involving patient factors, doctor factors, practice factors and health system factors, (Ramirez et al., 1999, Smith et al., 2005, Macdonald et al., 2006, Mitchell et al., 2008 and Macleod et al., 2009). Whilst these are important studies that need to be discussed there is very little evidence exploring factors that influence GPs in recognising and referring for suspected lung cancer.

Additionally, outside the current literature of Ramirez et al. 1999, Smith et al. 2005, Macdonald et al. 2006, Mitchell et al. 2008 and Macleod et al. 2009 the study by Berglund et al. (2010) suggests further efforts to ensure equal access to health services and the monitoring of adherence to guidelines are as equally important to reduce system delay. Furthermore, Molassiotis et al. (2010) highlights how delays in diagnosis are attributed to both patient factors and system-related factors. System related factors will be discussed later in this chapter.

To summarise, it is viewed that little is known about GPs experiences relating to the recognition and referral of suspected lung cancer and the contributory factors that underpin issues relating to this challenging and sometimes complex diagnostic process. The lack of research into GPs opinions and experiences of patient presentations within a lung cancer context is of some concern. The student suggests that there is much to learn regarding GPs medical decision-making and in understanding the recognition and referral processes relating to lung cancer by listening to individuals and gaining an in-depth insight into their experiences. This research aims to address the current lack of evidence and understanding of factors that influence GPs in the recognition and referral of suspected lung cancer.

2.7 Factors that contribute to patient presentation and recognition by professionals

2.7.1 Introduction

The possible influence of delays in the diagnosis of cancer and the risk factors for delay in patients with cancer have been the subject of considerable interest and controversy for many years (Macleod et al., 2009). Thus, it is important for the student to consider processes involved in cancer diagnosis from both patient presentation and recognition by practitioners as contemporary concepts of delay highlight the interrelationship between patient presentations and GP behaviour.

This section will examine a range of factors drawn from the literature that have been shown to influence delay and also have a potential to impact on cancer outcomes. The first section will begin with patient factors, and will explore patient characteristics and their association to delay. These factors include demographic, psycho-social and physiological factors.

The second part of this section will examine factors that encompass primary care, considering practitioner-related aspects involving GP and practice-related characteristics. The final part will examine health system-related factors. These include delays related to access, logistics, referrals and procedures within primary care.

2.7.2 Patient factors

The student has identified five influential systematic reviews that span from 1999 to 2009 and has examined factors that influence patients and professionals in cancer delay. Due to the rigorous nature of the systematic review process and its ability to demonstrate robust and transparent findings the studies will be used to assess current evidence. The reviews by Ramirez et al., (1999), Smith et al., (2005), Macdonald et al., (2006), Mitchell et al., (2008) and Macleod et al., (2009) cover a range of cancers and contribute to the understanding of factors that influence patients and professionals.

The evidence presented by Ramirez in their systematic literature review on factors associated with delay in patients with breast cancer demonstrated an association between older age and patient delay, and that delay by patients is unrelated to marital status. The same review found moderate evidence of influences attributable to education and ethnicity, but insufficient evidence for that of lower socioeconomic status. Ramirez concludes that due to the insufficient quality of many studies they were unable to give definitive answers to many of their original research questions and determine which factors contribute to strategies that reduce patient delay. The review also highlighted the need for educational strategies targeting patients and professionals, and to explore organisational changes to reduce patient and professional delay. Whilst the study gives us some insight into certain factors associated with delays in breast cancer Ramirez recognises further research is needed, firstly for larger studies to test whether specific factors are of particular importance within certain groups of patients using ethnicity, psycho-social factors and a sociodemographic lens and secondly, from a qualitative perspective to further clarify the nature of some of the relations involving values and attitudes.

Expanding the debate on from Ramirez and the need for understanding psycho-social factors, values and beliefs is the study by Smith et al. (2005) who produced a synthesis of qualitative research on patient help-seeking experiences and delay within cancer, unearthing a number of important factors that influenced cancer presentation. The review demonstrated similarities of patient behaviour across different cancer types with prominent factors such as symptom recognition, interpretation, and how patients attribute abnormalities and bodily changes to the seriousness of their illness. The findings highlighted fear as a prominent factor, including fear of a consultation as well as fear of cancer itself and its association with pain, suffering, and death. The issue of fear of embarrassment was also evident reflecting the feeling of patients towards symptoms that affected a sensitive body area. The synthesis suggested patients were more likely to delay going to the doctor as they interpreted their symptoms as trivial. Evidence of gender being an important factor is also highlighted with men viewing help-seeking as non-masculine and a sign of weakness and that both genders are embarrassed about presenting when it concerns a sensitive area of the body. The review by Macdonald et al. (2006), on factors influencing patient and practitioner delay in diagnosis of upper gastro-intestinal (GI) cancer describe patients' symptom interpretations, and in particular their failure to interpret their symptoms as potentially serious or even to recognise a symptom's presence. Other factors involving perceptions of the seriousness of symptoms which were based on family history, values and beliefs, experiences and lower socio-economic status were also associated with an increase in delay. The concept of fear and its associated perceptions with cancer symptoms were also described. Within some studies it was a motivational factor to present earlier and associated with reduced delay, but for some it had a negative influence and resulted in increased delay, indicating that patients were often afraid of the potential diagnosis or fear of unpleasant tests. The review describes a dearth of evidence relating to the variation of patient response to symptoms and early warning signs. Many studies focused on the appropriateness of patient response to symptoms, and only a minority attempted to explore the reasons for this, and then primarily from a psychological perspective rather than from a social perspective. As a consequence little conclusive evidence of how age, education and social networks influenced patient response to symptoms was presented. Mitchell et al. (2008), conducted a systematic review on pre-hospital delay in the diagnosis of colorectal cancer which reports the influence of symptom awareness and patients' symptom interpretation as a common theme across all the fifty-four studies included. Non-recognition of the seriousness of symptoms on the part of the patient increased delay as did symptom denial. Patient delay was greater for rectal than colon cancers and the presence of more serious symptoms, such as pain, reduced delay. In contrast to other reviews, the findings suggest there was no relationship between delay and the age, gender or socioeconomic status of the patient. One important finding by Mitchell centres on the complex relationship between presentation behaviour and the presenting symptoms suggesting that if delay is to be reduced, what is important is not simply patient awareness of symptoms but rather their recognition and understanding of the potential seriousness of those symptoms.

The review by Macleod et al. (2009), examining risk factors in delayed presentation and referral of cancer, emphasises the complexity and the multi-factorial reasons that influence outcomes. Macleod describes the predominant risk factor for patient delay as a lack of interpretation of the seriousness of the symptoms. If the symptom type is vague or atypical, delayed presentation can be increased, this period is referred to as symptom appraisal in the Andersen model. Conversely, Macleod also describes how more defined or alarming symptoms, such as bleeding, lump or severe pain, lead to a reduced time to presentation. The study also found social networks and social support via family and friends helped patients seek advice or form decisions. These networks were found to be important factors in delay for patients with colorectal cancer. The findings from Macleod also draw parallels with Safer whose findings hypothesised situational factors such as competing life events and their associated costs within a socio-demographic context contribute to what he describes as utilisation delay.

2.7.2.1 Symptoms, symptom awareness and symptom interpretation

Table 2.2: Symptom clarification

Presentation	**Clarification**
Symptom	Symptom refers to a variety of issues that impact on the patient's wellbeing. Symptoms are often defined in two camps, the first are salient features in which they are prominent such as severe pain, bleeding or a lump. The opposite are insidious features which are vague in nature and sometimes viewed as due to old age.
Symptom awareness	This refers to the patient's ability to recognise the prominence of the features and how the symptom impacts on their daily lives or is sometimes dependent on the patient's health beliefs.
Symptom interpretation	This refers to the patient's ability to recognise there may be something wrong or unusual happening in which cognition may occur to consciously seek help or not.

Table 2.2 describes the clarification of symptoms and the different terms used when discussing symptoms from the literature. The student has contextualised these terms into three types of presentation when referring to symptoms.

As described in the previous discussion symptom awareness has a marked impact on delay. The findings in reviews by Macdonald et al. (2006) and Smith et al. (2005), highlight the importance of symptom interpretation by patients and the impact it has on delay. The perceived seriousness of symptoms influenced delay with the presence of pain or severe bleeding resulting in quicker consultations. According to Molassiotis et al. (2010, p. 107) "certain socio-demographics involving gender, marital status, ethnicity, education and occupation and psychosocial factors involving negative beliefs and fears about cancer and clinical characteristics (i.e. symptoms other than a lump) may alter a person's perception of the symptom" thus increasing patient delay. This qualitative study explored patients' retrospective accounts and mapped their experiences from initial changes in health to cancer diagnosis and considered patient and system factors and how they mediated the process. The study applied the Andersen model of total patient delay to a sample which consisted of 75 patients randomly selected from an outpatients department in a large cancer hospital. Applying the Andersen model as a theoretical framework, Molassiotis established appraisal delay as one of the longest intervals contributing to delayed diagnosis. They also found the misattribution of symptoms by patients to things other than cancer including chronic conditions and the ageing process was also associated with an increase in patient delay. Psychological and attitudinal factors involving denial, avoidance and self-medication were also common features. Whilst the study presents data from retrospective patient accounts and may have recall bias, a prospective evaluation was not possible due to the challenging nature and expense such an evaluation presented. Indeed, the overwhelming majority of past research on diagnostic delay has been retrospective in nature which is unsurprising, considering the nature of the subject due to the uncertainty and the variability in patients prognosis and survival outcomes. Hence, while it contains some important information, it can only be used as the basis for further investigations and for raising the debate around diagnostic delays in patient cancer. This, and the convenience sampling used, limits the generalisability and transferability of the findings.

2.7.2.2 A synthesis of patient social factors that influence patient presentation

Table 2.1 shows some homogeneity as well as some heterogeneity within the literature regarding patient factors and the influence they have on patient presentation. One area where there seems some heterogeneity in the literature is the relevance of patient social factors and role they may play in patient presentation. The student will attempt to synthesise and discuss key papers that highlight these anomalous positions. These include Smith et al. (2005), Mitchell et al. (2008), Macleod et al. (2009), Molassiotis et al. (2010).

Examining patient factors highlighted by Smith et al. (2005) suggests patient gender acts as both a facilitator and a barrier to prompt action. Their findings highlight both men and women who delayed seeing a doctor were concerned at been labelled either neurotic or a timewaster [respectively?] due to diverse or embarrassing symptoms. Whilst the findings suggest both genders delayed, men in particular associated seeing the doctor with weakness and the admission of being ill impacting on their masculinity. In contrast, Mitchell et al. (2008) purports that gender had no impact on delay. This anomalous position from Mitchell is curious as her study which was a systematic review on pre-hospital delay for colorectal cancer also indicated patient factors such as age and lower socioeconomic status had no relationship with patient delay; however, there was some evidence of an association between longer waiting time for referral and lower social class. Limitations to the Mitchell study relate to the nature of one particular cancer site and the variability in the quality of studies, thus the study was not able to conduct a meta-analysis and give definitive findings. These limitations are of particular interest as there seems to be commonality with a more recent systematic review conducted by Neal et al. (2015) which examined many different tumour sites and the nature of the tumour site and delay. Neal's findings indicate that study quality varied with only a small number of higher quality studies thus precluding any definitive findings. Neal concludes by suggesting speedier action in the diagnosis of symptomatic cancer has merit however; this does varies depending on tumour site and what is particular poignant for this study is the review focusing on lung cancer had mixed findings reporting positive, negative or no associations across different time intervals. .

The importance of patient's wider social context was highlighted by Mitchell et al. (2008) and posits social networks are viewed as a facilitator in help-seeking behaviour and reducing delay. Social networks are also highlighted by Macleod et al. (2009), whose study involved two worldwide systematic reviews of the literature on patient-mediated and practitioner-mediated delays. Macleod emphasises that multiple patient factors influence cancer outcomes and these range from lack of symptom interpretation which is due to the nature of the symptom and in particular if vague or atypical, through to patient characteristics-related socio-demographic and psychosocial factors. However, the findings are not inclusive of all cancers as Macleod argues socio-economic status and educational level are factors for several common cancers but not others. Macleod also posits that gender is not associated with delay with the exception of bladder cancer. This supports previous research findings from Mitchell et al. (2008) but it is in contrast with Smith et al. (2005). This variation in findings further adds to the debate about the potential need for further high quality studies in this arena as emerging theme across reviews conducted by Ramirez et al. (1999), Mitchell et al. (2008) and Neal et al., (2015) is that the lack of high quality studies had a bearing on their findings.

Expanding the debate further and considering a theoretical framework to assist the discussion on examining patient factors and delay was the study by Molassiotis et al. (2010). This study, which was a qualitative exploration of seventy five patients diagnosed with cancer, discussed their pre-diagnosis experience as part of a broader understanding of symptom experience. Findings from the study are indicative of multiple factors affecting patient pathways to diagnosis and in particular patient related factors. These include psychosocial, socio-demographic and clinical factors and the misattribution of symptoms by patients to things other than cancer including chronic conditions and the ageing process associated with an increase in patient delay. Psychological and attitudinal factors involving denial, avoidance and self-medication were also common features. One important recommendation by Molassiotis for future research and is the premise for this student's research is the investigation of primary care experiences and examining factors in the diagnostic process in order to gain a deeper understanding in health system and treatment delay.

To summarise, whilst patient related factors are clearly highlighted in the literature upon further in-depth examination it seems in part heterogeneous. It is suggested the heterogeneity is partially due to previous studies focusing on either one cancer type or the limited high quality studies within the literature. This makes it difficult to give definitive findings. However, what we can draw from the literature is patient factors and the interrelationship with delay are complex, non-linear and multi-factorial which involve a broader context often beyond patient's individual characteristics such ethnicity, age and gender but considers their social environment, values, beliefs and attitudes (Macleod et al., 2009). It is suggested there is a need for further research examining lung cancer that considers issues related to a much broader spectrum of illness behaviour and factoring in a wider social context.

2.7.2.3 Psycho-social and socio-demographic factors

Factors that involve psycho-social aspects include human emotions, cognition and behaviours occurring within a wider cultural context. Socio-demographic aspects are defined by social class, household income, age, ethnicity, education and occupation. The investigation of psycho-social factors is to consider associations between individual's life circumstance and the social and cultural context and its impact on time to presentation. The review undertaken by Macdonald et al. (2006), described earlier, highlights how lower socio-economic status increases delay, and yet gender has no impact.

The analysis of data from the 'National survey of NHS Patients; Cancer' by Neal and Allgar (2005), in which they describe relationships between socio-demographic factors and the components of diagnostic delay (total, patient and primary care, referral, secondary care) for six cancers (breast, colorectal, lung, ovarian, prostate and non-Hodgkin's lymphoma) highlights associations between some of the socio-demographic variables including social class and ethnicity. The findings show the strength of factors varied by each cancer type. For example, colorectal cancer, non-Hodgkin's lymphoma and breast cancer highlight patient characteristics such as age, marital status and ethnicity as key factors in delays.

Interestingly, marital status or living with a partner was found to be unrelated to presentation patterns for breast, gynaecological, lung, upper gastrointestinal and urological cancers (Franceschi et al., 1983; Thornhill et al., 1987; Mor et al., 1990; Mansson et al., 1993; Andersen et al., 1995; Fitzpatrick et al., 1998; Ramirez et al., 1999; Macdonald et al., 2006). Patients with breast cancer who did not disclose their symptoms within a week to someone close to them were more likely to delay seeking help (Ramirez et al., 1999). The findings by Smith et al. (2009), who considered factors contributing to time to consultation found that the most important social factor was living alone, and that it is not partnerships that is the issue. This may be because partners or co-habitees notice symptoms and sanction help-seeking behaviour.

Figure 2.1: Factors influencing patient presention

Figure 2.1 shows the different patient factors highlighted in the literature that influence patient presentation and cancer delay. The diagram has been grouped into two themes using socio-demographic and psychosocial factors which seem to be appropriate in relation to specific factors unearthed in the literature. The figure demonstrates how these factors can play an important role in explaining the complexity in patient delay but also the interrelationship between factors. In the literature patient factors are largely explored as individual variables, however as a whole the panoply of patient factors highlighted in figure 2.1 suggests that when patients present, firstly they may have a different way of viewing and interpreting cancer and secondly, if presenting with numerous factors there is a layer of complexity that GPs have to navigate, interpret and understand before making informed medical decisions.

In summary the literature paints a complex picture of patient factors that influence patient presentation. Due in part to the lack of high quality studies and the nature of some studies been conducted (the focus only on one cancer tumour site) the findings related to patients social factors and delay seem mixed and are unclear. Where there seems to be some homogeneity within the literature is with the psychosocial context that considers values, beliefs, attitudes and illness behaviours and where there seems more heterogeneity it is suggested that this lies within socio-demographic context and can be related to age, gender, and ethnicity and marital status and social class.

2.7.3 Factors influencing primary care professionals (GPs)

Within the UK (and most other countries) primary care doctors are defined as general practitioners (GPs) and they are often the first point of contact for patients. GPs are sometimes described as family practitioners or practitioners working within family medicine. For this thesis the term general practitioners or the initials GP will be applied. The cancer literature highlights many factors influencing general practitioners in the referral behaviour within cancer. These include patient characteristics, symptom presentation, recognition and GP clinical acumen. Patient characteristics relating to age and gender influenced practitioner referral behaviour with older patients being referred more quickly for symptoms of breast, upper gastrointestinal and colorectal cancers (Ramirez et al., 1999; Macdonald et al., 2006; Mitchell et al., 2008). It is suggested that youth can be a risk factor for delay by health professionals (Ramirez et al., 1999). Macdonald et al. (2006), describe how factors influencing practitioner delay in referral have been shown to be related to initial misdiagnosis of a common symptom or failure to make or consider a diagnosis at the initial encounter with the patient. Additionally, Macdonald et al. (2006, p. 1276), also states "inappropriate tests, inaccurate test results and previous receipt of negative test results have been highlighted as additional courses of delay". However, the study also highlights there are significant challenges for GPs in assessing symptoms in particular those less clear or vague which could be addressed within guidelines.

Interestingly, the study by Jiwa et al (2004) highlights that guidelines and protocols can seem to 'swamp' GPs and impact on their ability to function affectively. It is argued that the consultation process can often detract from the GP's ability to establish the seriousness of presenting symptoms with patients often presenting with multiple issues and symptoms such that the most serious can often get lost within the diagnostic reasoning process, as Jiwa et al. (2004, p. 5) state, "more is missed by not looking than not knowing". This is an important point as figure 2.1 highlights patient's socio-demographic and psycho-social factors that can influence GP reasoning. Furthermore, Jiwa describes this as the patients "saving up" health concerns until a convenient occasion to present although combining this with other business such as shopping. It is suggested this leads to additional pressure for GPs to remain vigilant to "red flag" cancer symptoms in the consultation. This increased vigilance for salient features can often be a distraction for more insidious symptoms as Ramirez et al. (1999) report, females presenting with a breast symptom other than a lump were associated with greater delay by practitioners.

A study by Delva et al. (2011), describes patient factors influencing GPs in the referral of elderly cancer patients. Factors involving organisational difficulties (cancer care provision), limited medical education within oncology amongst GPs, patient and several disease factors were identified. The study concluded that GPs were influenced by the five following patient-linked factors: '1) wish or reluctance on the part of the patient; 2) wish of the family if present; 3) presence or absence of serious co-morbidity; 4) unsuitability of conducting invasive investigations; and 5) the degree of mental and physical autonomy on the part of the patient' (Delva et al. 2011, p. 4). However, it is important to apply a cautionary lens to this study as there are some limitations. First is the method chosen, a postal questionnaire, which presents a risk of selection bias, secondly after efforts to increase the response rate through a regional GP database there was a slight majority of male and rural GPs who responded. Finally, the other limitations involve the use of clinical case vignettes as part of the questionnaire covering two specific cancer sites which was to examine GP attitudes and how they should care for the patients. It is suggested GPs may have been influenced by the prognosis for these specific cancers in their responses.

2.7.4 Practice factors

Few studies have examined practice factors. The Danish study by Hansen et al. (2011), examined GP characteristics and delay in cancer diagnosis. Their findings highlighted how GPs provide many services, with daytime surgery consultations, telephone consultations, and home visits which are generally viewed as core services within UK general practice. The patients in the study experienced a shorter system delay than those whose health services offered limited services. The study was a population-based cohort study involving a questionnaire and included 334 GPs and their 1,525 newly diagnosed cancer patients. Delay was categorised in three sections: patient-related, doctor-related and system-related. The findings highlight GP seniority, list size, CME activity, practice organisation, GPs limited knowledge of patients, job satisfaction and level of burnout were not associated with delay which seems curious as these factors of often hypothesised to be associated with performance and doctor delay. Additionally, what the study also purports was the association between female GPs and patients experiencing a shorter delay informing a hypothesis that female GPs may be viewed as more accessible and trustworthy in comparison to male GPs. However, what seems additionally contradictory in the findings is a female GP was often associated with longer system delays. The definition used for system related delay in this study was described as "waits for investigations in secondary care and delays due to administrative procedures or poor logistic in the planning of investigation" (Hansen et al., 2011, p 5). Whilst it's difficult to establish clarity to this anomalous position it is suggested there are gender differences at play which are unexplained in any detail in the study. However, Hansen does invite a hypothesis that there may be some variation in the quality of GP's functions within the diagnostic work-up involving case management and co-ordination. Case management (CM) in this context is meant as an organisational approach used in treatment and care for individuals within complex patient groups.

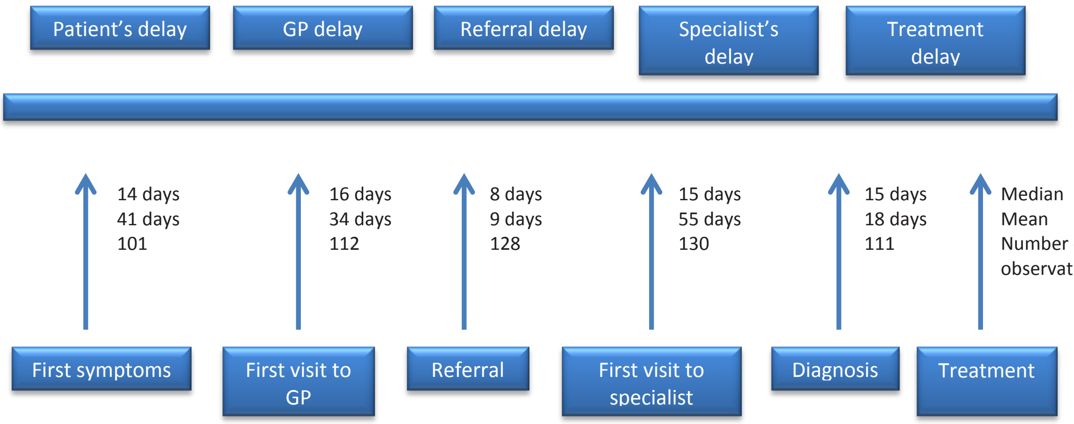
Additionally, whilst the study has been conducted in Denmark there is some relevance to the UK due to some similarities in the healthcare system however; caution is also needed as the data suggests some homogeneity across general practice in Denmark other cultural factors such as levels of gatekeeping need to be considered before extrapolating.

2.7.5 Health system factors

While patient-related factors are clearly highlighted in the literature, system factors have not been studied adequately, with only a handful of small studies published. A study by Daly and Collin (2007) involving 47 GPs in focus groups, and a national survey with 929 GPs in Ireland, highlighted the challenges and barriers faced by GPs. They found the principle barriers identified were not confined to early diagnosis but applied to the diagnosis of cancer at any stage. Daly and Collin conclude that there was a lack of direct access to diagnostic tests, difficulties with hospital referrals, unclear recommendations for screening, 'poor communication and access to secondary care and the need for further education and clinical practice guidelines'.

The study by Hansen et al. (2011) highlights system-related delay as composed of waits for investigations in secondary care and delay due to administrative procedures or poor logistics in the planning of investigations. Salomaa et al. (2005), whose Finnish retrospective study on lung cancer delays was based on patient records that measured delays of diagnosis and established timelines from symptom recognition to a visit to the GP's surgery and thence to secondary care treatment, concluded that there were several reasons for long delays involving numerous consecutive procedures before diagnosis. Figure 2.2 illustrates the median delays from the study, with the median patient delay being 14 days, the median GP delay 16 days, median referral delay 8 days, the median specialist delay 15 days, and the treatment delay calculated in patients who received the best supportive care 15 days.

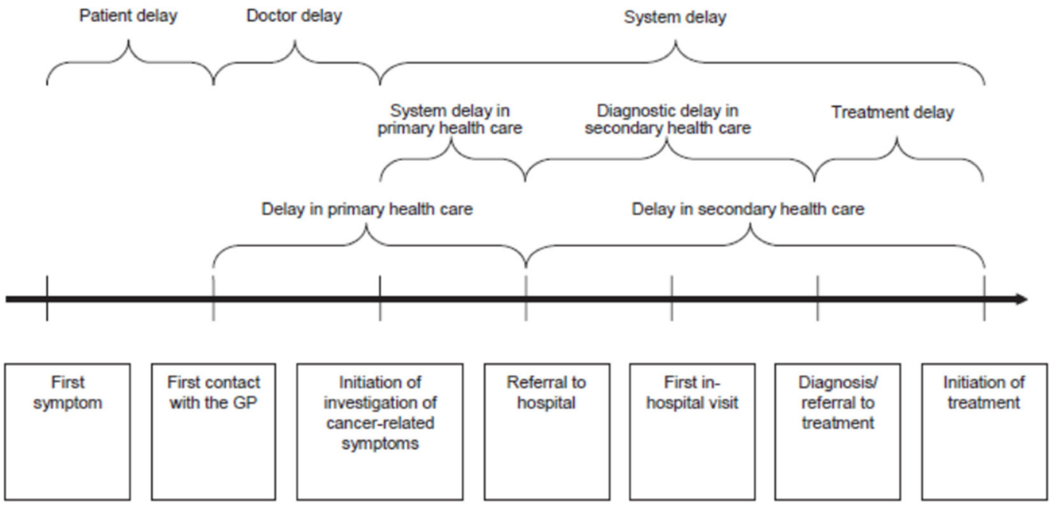
Figure 2.2: The median delays



(Adapted from Salomaa et al., 2005, p. 2284)

Hansen et al (2011), highlight how few studies have analysed in detail how delay is related to the health-seeking behaviour of patients, clinical performance of GPs and system-related factors such as logistics, wait times and administrative procedures. What is interesting, and is visualised in Figure 2.3, is the computed delay from dates provided by the GPs and categorised by type as shown in Figure 2.3: patient delay (median 21 days), doctor delay (median 0 day) and system delay (median 55 days). The figure for system delay is surprisingly lengthy, but does draw some parallels from Salomaa (2005), with evidence from her retrospective study showed that patient delays were quite long and primary care delays were also viewed too long in accordance to recommendations by the British Thoracic Society (1998).

Figure 2.3: Categorisation of delay across the health system



(Hansen et al. 2011, p. 3)

2.8 Factors that contribute to delays in the recognition, referral and diagnosis of lung cancer

2.8.1 Introduction

As in the previous sections of this literature review there are some commonalities relating to factors influencing lung cancer delay and other types of cancer. According to Moody et al. (2004, p. 1), "the factors which affect the prognosis in lung cancer are principally the stage and related performance status at presentation, histology (that is, the biological activity of the tumour), co-morbidity, age, sex, and the time interval between first symptom and treatment". Reducing intervals between presentation and treatment might allow an improvement in survival. The study by Myrdal et al. (2004), suggests that increased delay (patient or hospital) has no negative influence on survival for the majority of patients because of the high proportion of patients who present with stage III/IV of the disease. According to Corner et al. (2005), this is attributable to the fact that late diagnosis often accounts for an inoperable disease and one could infer that the majority of late diagnoses may be inevitable due the vagueness of symptoms. This is still evident in recent literature by Molassiotis et al. (2010), who posit that the vague nature of symptoms increases patient and treatment delay. The findings of Muers et al. (1996) highlight how efforts to improve lung cancer mortality must focus on reducing delays to treatment and ensuring better access to specialist care.

2.8.2 Patient factors

The interval between the patient's first cancer symptom and presentation (within

patient delay) is currently under intense investigation as a possible target for health education action. The reasons why patients present when they do and with the symptoms they do is a highly complex phenomenon which is influenced by various factors such as age and health expectations, health education, background symptoms, fear, and their impressions about health care (Muers et al. 1999). These complexities have been discussed and examined in some detail earlier in this chapter. According to Muers, delays in the diagnosis of lung cancer depend mainly on three factors: the patient, the clinician and the health-care system. However, one can argue that in the case of patient factors some delays may be unavoidable, with Corner et al. (2006), highlighting how patients did not consciously 'delay' seeking help, as it did not occur to them that they were ill but that their symptoms were part of the normal course of everyday life and the lay expectation of getting old. The retrospective qualitative study of 22 patients, 12 male and 10 female, was conducted using patients recruited from outpatient departments from two large hospitals, one in the south of England, the other in the north. Six themes emerged from the study which related to experiences of health changes and reasons for delay in seeking help prior to diagnosis. These were:
experiencing uncertainty over what was 'normal' and being slow to go to a doctor for help

- health changes as part of 'everyday' fluctuations of bodily functioning
- disconnected interpretations of bodily changes
- the problem of co-morbidity
- not associating health changes with lung cancer
- Feeling unworthy of treatment (Corner et al. 2006, p. 1384).

Most notably, the findings established that all participants experienced changes in their health over a period of a year. Corner highlights this as being a universal characteristic of the patient's accounts which is in contrast to other cancer type studies. The key findings by Corner describe patients' lung cancer symptoms not being interpreted as important because of their vagueness and what symptoms they were aware of were attributed to everyday life. This conflicts with studies of other cancer types where the majority of patients act quickly in response to symptoms which are often well defined and are viewed as serious. This fits with the conclusions from a number of systematic literature reviews by Ramirez et al. (1999), Macleod et al. (2009), and Smith et al. (2009), that symptom interpretation by patients is an important factor in the earlier diagnosis of cancer. In a recent systematic review, Walter et al. (2012), further expand the discussion relating to the word 'delay' and conclude that, due to the large variation of duration of total patient delay reported in studies for some patients and some symptoms, delay appeared minimal. Therefore, questioning the use of the term delay which is often value-laden and inaccurate, contemporary literature introduces a more appropriate description of 'time intervals'. However, the term delay is used extensively in the literature and as such is impossible to completely avoid in a review of this nature.

Individual characteristics have also been identified to influence delay (Andersen et al., 1995, Ramirez et al., 1999), but the evidence in Corner's study implies that delay is a universal characteristic across all participants which raises the question of whether socio-economic status, education and age are influencing factors. It is important to highlight limitations to the Corner study, notably that it was a small sample (n=22) and it concerned retrospective accounts which may lead to recall bias. However, Corner does indicate that the data gathered appeared to reveal little knowledge of connections between an individual's health changes and lung cancer. The findings of the Corner study highlights the paucity or the vagueness of lung cancer symptoms and establishes some unique participant insights into lay initiation in seeking help that differ from the findings of other cancer studies. Corner concludes the lack of social movement, political agendas, or institutional backing for mobilising action towards lung cancer are significant factors when considering individuals' lay expectations and perceptions especially when contrasted to breast cancer where mobilisation of efforts have been present for some period of time. This may contribute to the participant's accounts where she describes "the lack of social prominence of lung cancer reinforces a general predisposition among individuals with symptoms of lung cancer to assume that these are normal bodily changes" (Corner et al., 2006, p. 1390).

The study by Smith et al. (2009), takes another important step in widening the debate on illuminating insights and understanding factors that influence delays in lung cancer. The study was a cross-sectional survey of 360 participants who were newly diagnosed with lung cancer and were recruited from three hospitals based in the West and North East of Scotland. The study aimed to explore and determine what patient factors are associated with the time taken to consult with symptoms of lung cancer, and whether those from rural or deprived areas wait longer than those from urban or affluent areas before seeking medical help. Of the 360 participants 58% were men and 42% were women with the median age being 68 (range 37-87). The main findings found no substantial relationship between socio-demographic or geographic factors and time taken to present, which contrasts with findings from Molassiotis et al. (2010), who identify that some socio-demographic factors such as age and social context that perpetuate negative perceptions of cancer may be linked to cancer delay. Several factors may contribute to social gradients in cancer survival including the patient's general health status, knowledge and healthcare seeking behaviours, characteristics of the tumour at time of diagnosis and clinical management (Berglund et al., 2012).

Within the Smith study over 50% of participants experienced a delay of 14 weeks or more before presenting to a medical practitioner, primarily due to symptoms being ignored or not seen as potentially serious which draws some parallels with the findings of Corner et al. (2006), and Molassiotis et al. (2010). Further findings by Smith et al. (2009) indicate that smoking was associated with increased time to presentation due to smokers 'normalising' and being more tolerant or for the acceptance of symptoms being due to being a smoker. A key social factor for influencing time to presentation was living alone, in that people who lived alone took longer to present; the authors hypothesised that this was due to the lack of partners, husbands and wives noticing symptoms and so ''sanctioning help-seeking behaviour'' (Ibid). Co-morbidities were identified as an important factor, in particular COPD symptoms may mask the more serious nature of the illness and also increase delay through the prescribing of antibiotics. However, Smith also notes that some co-morbidity, e.g., chest infections, can be associated with a shorter time to presentation due to certain symptoms alerting the individual to present sooner. This contrasts with Bjeragers et al. (2006), whose study examined delays in the diagnosis of lung cancer in general practice, and highlights how co-morbidities produced prolonged delay for some patients due to the symptoms being ascribed to an already known disease which masked and diverted the focus away from lung cancer symptoms. Smith concludes that his findings add weight to other qualitative findings that lung cancer symptoms are experienced for several months before individuals present to a medical practitioner even though it is thought to be asymptomatic until well advanced. It is suggested most symptoms are unrecognisable for some weeks, and it is only previously known symptoms that alert the individuals to consider earlier presentation. It is important to apply a cautionary lens to Smiths study as it is not with its limitations. Firstly, findings are derived from retrospective investigation so are subject to recall bias and study recruitment due to patients dying and potentially the behavioural responses by participants due to the stigma of a smoking-related disease.

Corner et al. (2006) examined the recollections of symptom experiences post-diagnosis in lung cancer patients and described patients identifying health changes but many interpreting these new changes as not serious enough to warrant a presentation to a healthcare professional with the exception of haemoptysis. The findings suggest patients did not attribute their symptom changes to ill health or acknowledge that the symptoms were abnormal and were often bound up in everyday living. Corner also unearthed nihilistic attitudes amongst smokers and the perception that they often feel undeserving of medical care and treatment due to their smoking habit which are important factors to consider in patient delay. Corner goes further and hypothesises the latter perceptions of being undeserving and of cancer being a self-inflicted consequence of personal behaviour as being due to early anti-smoking campaigns in which the creative direction was less empathetic and supportive than judgemental which, in turn, has developed a culture of victimisation of smokers while further perpetuating their negative attitudes towards treatment and support. Findings by Chapple et al. (2004) also included nihilistic attitudes. The qualitative study captured lung cancer patients' experiences and attitudes involving stigma and self-blame. The findings by Chapple highlighted how the stigmatisation of people with lung cancer deterred them from seeking support. The study also implies that the influence of the media at large may have contributed to the increase in stigma with advertisements usually portraying a dreadful death possibly exacerbating fear and anxiety. More recent findings from Smith et al. (2009), whose cross-sectional quantitative study describes some patients as having a higher tolerance for symptoms due to accepting them as normal for smokers is also associated with an increased delay in presentation. This higher tolerance of symptoms may potentially be an exacerbation of the patient's social context and individual health beliefs as well as being a factor of living alone and therefore having no co-habitees to notice symptoms and encourage help-seeking behaviour.

2.9 Summary of the chapter

This part of the review was to ascertain factors from literature that have some bearing on the outcomes of delays in cancer diagnosis. Having examined the literature there are many contributing factors involving patient, primary care and secondary care, all of which compound and interact with one another within the healthcare system. What have emerged from the findings are some consistencies involving symptom recognition and interpretation, social networks but also some contrasting evidence regarding age. The review by Ramirez et al. (1999), aimed to understand factors that influenced delay with symptomatic breast cancer, and described a strong association between older age and delay, but this research contrasted with Macdonald et al. (2006), whose systematic review of factors influencing patient and practitioner of upper GI cancer concluded that there was little conclusive evidence of age being an influencing factor. Other findings highlighted by Macdonald et al. (2006), emphasised other patient characteristics which influence delay. The findings suggest lower socio-economic status increased delay whereas gender had no impact.

The survey by Salomaa et al. (2005), indicates long delays due to the numerous procedures undertaken within primary and secondary care before cancer is diagnosed, and while the study was undertaken in Finland the inferences drawn from this have some utility for the UK in understanding the social, environmental and psychological factors of patients and how and what influences an individual's behaviourial delay. The study suggests that GP factors appear to influence delay which can involve both decision-making and the referral processes.

The latter part of the literature review has focused on unearthing and examining factors related to lung cancer and how these influence delay. The studies that are highlighted identify factors that are not just attributable to lung cancer but are also identifiable in other cancer studies and are discussed earlier in this chapter. For example, patient factors and the psychology of symptom interpretation that influences delay is not just confined to lung cancer. The review identifies factors that fit within three main themes. These are related to patient, clinician and health system factors.

There is similar evidence across other cancer sites; the systematic review by Smith et al. (2005), demonstrates similar behavioural patterns and symptom interpretation due to not recognising bodily changes and the perceived seriousness of symptoms. The Corner study (2006), further emphasises this as the findings suggest the uncertainty of what was normal with patients relating their health changes to everyday fluctuations in bodily functions. However, what does distinguish lung cancer from other cancer types is the added layer of complication due to the subtle nature and vagueness of its symptoms and also co-morbidities like COPD which can often mask and redirect focus away from the potential seriousness of the symptoms although it isn't the only cancer with vague symptoms – ovarian cancer, for example, would generally be considered equally vague.

The study by Corner et al. (2006), highlights the important influence of wider institutional and political factors that can mobilise change from re-engineering individual behaviour through to changing an individual's psychological and health expectation of lung cancer as has been so successfully orchestrated within a breast cancer context. Of the research that has been conducted on lung cancer the findings focus on insights into patient factors, drawing a number of viewpoints, but often focusing on symptom interpretation. The literature involving clinical and practice factors and the recognition and referral of lung cancer were less explicit and more heterogeneous in nature. There seems a dearth of literature on GP behaviour related to lung cancer and it is difficult to draw firm conclusions from what is available. Some of the contemporary literature does attempt to draw upon theoretical underpinnings regarding time to presentation (delay) and attempt to generate a hypothesis, but the majority of the existing literature often fails to demonstrate a clear theoretical framework. The evidence that is available examines GPs and focuses on practitioner characteristics that includes behaviour, age, gender, geographical area, practice setting, number of years in medical practice, working situation (single or partnership) working time and training (Delva et al., 2011).

While much of the research to date has focused on symptoms, however, it is clear in the literature that there is variability in practice and so recently the focus has moved to practitioners and what may enable them to make a diagnosis of cancer more appropriately. Within Chapter 3 the student will explore GP behaviour and examine how GPs make decisions. The chapter will aim to unearth factors that interplay between decision-making and cancer diagnosis with a specific focus on lung cancer recognition and referral.

Chapter 3

Literature review part 2

3.1 Introduction

The factors that are known to be associated with the recognition and referral for cancer, and specifically lung cancer, have been discussed in some detail in chapter two. The focus for this chapter will be to examine and understand the processes of medical decision-making and in particular of recognition and referral within general practice. As described earlier in chapter 1 section 1.7, the task of the GP is to provide personal, primary, preventive and continuing care to individuals and families within their practice population. Whilst remaining mindful of this context, the chapter will examine theoretical aspects of medical decision-making before focusing on general practice to establish an understanding of GP decision-making processes, and learn more about their decision-making within the practice environment and the context of cancer and lung cancer diagnosis. Recent literature searches into this area have uncovered very few examples of GP medical decision-making within a lung cancer context which suggests that this area is under-researched. A literature search from 1980 to the present day was conducted using the medical and social science databases MEDLINE and EMBASE. The search comprised a range of search terms: primary care, family pract#, general pract#, medical decision making, clinical decision-making, clinical judgement, clinical reasoning, patient complaints, litigation, missed diagnosis, medical error, cancer and lung cancer and involved a range of search options.

3.2 Theoretical foundations of medical decision-making

There is a large body of theory-driven literature which considers models relating to how doctors make decisions, and like many theoretical models they are helpful in gaining an understanding about what has happened and why. According to Thompson et al. (2009, p. 55) “it is these theories that shape some understanding and it is these theoretical models of phenomena that enable clinicians to connect the dots between disparate facts and information”. One particular model, dual process theory, considers the intuitive system or system 1 and the analytical system or system 2, and may provide a framework with some resonance and application to decision-making, offering a particularly good fit for diagnostic consultations within general practice. This theory may aid the comprehension of a clinician’s decision-making process which is essential in the formulation of a clinical hypothesis and key to a diagnosis and the management of patients. As Croskerry (2009a, p. 1022) points out, “the overall diagnostic error rate remains unacceptably high. In more than four decades of research, a variety of approaches have been taken, but a consensus approach toward diagnostic decision making has not emerged”. Balla (2009, p. 964) describes dual process theory as “an integration of intuitive and analytic processes”, whilst

Croskerry (2009b) suggests that the theory has some application to decision-making and can provide a framework for understanding the variety of approaches that have been examined in the past.

There are a variety of terms used to discuss decision-making within medicine, and it is important to clarify the terms that are used when discussing decision-making within a medical context, considering which ones are interchangeable and which ones are not suitable for use in this thesis. Terms used can include medical decision-making, medical problem solving, clinical decision-making, clinical judgements and clinical and diagnostic reasoning. This thesis will use the term medical decision-making to represent all types of clinical and medical decisions including diagnostic decisions as well as referral and clinical management decisions within a medical context.

A definition posited by the Society of Medical Decision Making (2014), and adapted from Schwartz and Bergus (2008), suggests that “Medical decision science is a field that encompasses several related pursuits. As a normative endeavour, it proposes standards for ideal decision making. As a descriptive endeavour, it seeks to explain how physicians and patients routinely make decisions, and has identified both barriers to, and facilitators of, effective decision making. As a prescriptive endeavour, it seeks to develop tools that can guide physicians, their patients, and health care policymakers to make good decisions in practice”. Higgs and Jones (2008) define clinical reasoning as “a context dependent way of thinking and decision making in professional practice to guide practice actions”, or simply a range of cognitive processes that help evaluate and manage a patient’s medical problems. Croskerry (2009a, p. 1022), suggests “clinical judgement is a critical aspect of a physician’s performance in medicine and is essential in the formulation of a diagnosis”. Elstein and Schwartz (2002) describe diagnosis as a process for generating one or more hypotheses and to predict what additional findings should be present to test out these hypotheses. According to Norman, Barraclough et al. (2009), this process of generating hypotheses and drawing upon existing knowledge, associations and experience is part of the process of clinical reasoning. Clinical reasoning also informs other kinds of medical decisions including those concerning interpretation of the presentation and management of treatment as well as referral decisions. Given the abundance of literature on clinical or diagnostic reasoning and its many synonyms, including medical decision-making, medical problem-solving and clinical judgements, the challenge is to identify a theoretical stance relevant for GPs and to demonstrate how this process is associated with cancer recognition, referral and diagnosis and in particular lung cancer recognition, referral and diagnosis.

There have been some important strides made in recent years in research into decision-making within medicine with recent studies by Croskerry (2009a, 2009b), and Balla, Heneghan et al. (2009) championing a new universal model of reasoning and decision-making called dual process theory.

3.2.1 Dual Process theory

The theory posits two systems of decision-making, System 1 which is intuitive and considers inductive reasoning, heuristics and pattern recognition and System 2 which is analytical, considering deductive reasoning and is logical and systematic. Each system has its own set of distinct characteristics and properties.

Table 3.1: Comparison of intuitive and analytical approaches to decision-making

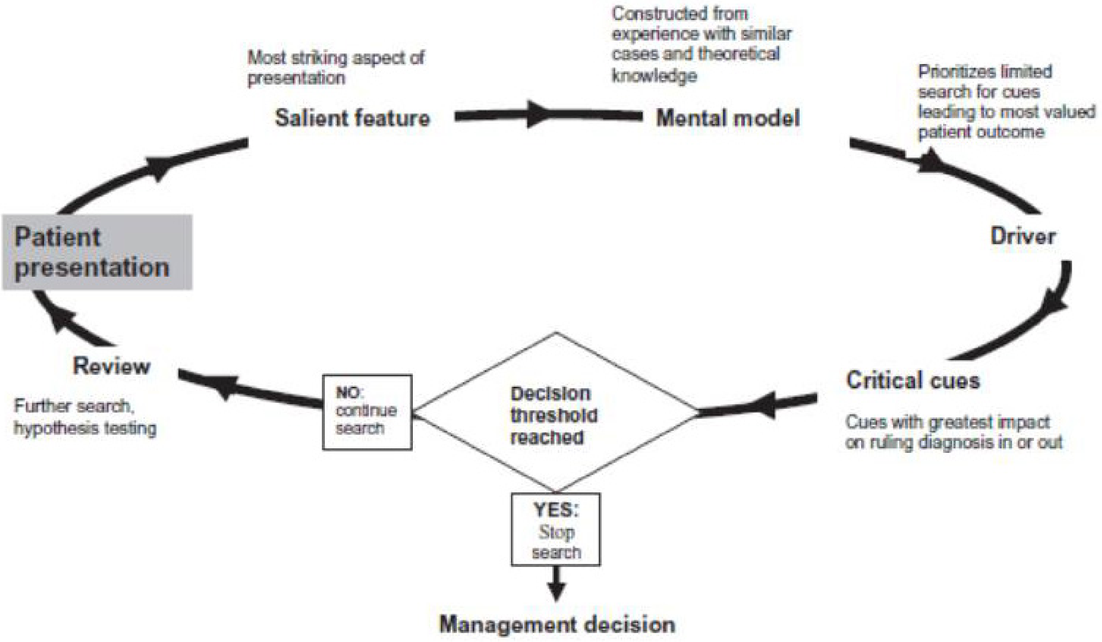
Intuitive	Analytical
Experiential-inductive	Hypothetico-deductive
Bounded rationality	Unbounded rationality
Heuristic	Normative reasoning
Gestalt effect/pattern recognition	Robust decision making
Modular (hard-wired) responsivity	Acquired, critical, logical thought
Recognition-primed/thin slicing	Multiple branching, arborisation
Unconscious thinking theory	Deliberate, purposeful thinking

(Adapted from Croskerry 2009a, p. 1023)

Table 3.1 shows the comparing characteristics and properties of intuitive and analytical approaches. Intuition focuses more on the experience of the decision maker and uses reasoning and pattern recognition to interpret and develop a clinical hypothesis. These often involve mental short cuts or heuristics. In contrast an analytical approach focuses on normative and deductive reasoning and rationality where hypothesis testing via the availability of resources or an algorithmic approach is more suited.

However, it is important to highlight that intuition and analytical approaches are not without their critics. Some researchers challenge the reliability of intuition, considering it more prone to errors due to contextual and affective factors of individuals even though it’s viewed as a more agile and dynamic process. Furthermore, the study by Pelaccia, Tardif et al. (2011) emphasise that alignment to an analytical system can lead to lower levels of performance due to the need for considerable cognitive resources. Thus, notwithstanding to the common belief that intuition has a higher error rate and subsequently poorer performance than to analytical systems, it is argued that both systems are equally prone to errors: a key limitation of these both approaches is one of context and individual difference. It is suggested by the student that they may therefore be less helpful in understanding the context of an embodied encounter between patient and GP. If we are to work on the premise similar to Balla et al 2009, (figure 3.1) in which they posit a cyclical model of reflective clinical practice within a patient encounter whereby the process involves a linear cyclical process then it is difficult to identify the areas where factors involving the patient and their context influence the process. It is argued by the student that these stages are not linear but are inter-changeable and varied. The model's cyclical process resonates with the student's previous experience in behavioural change and DiClemente and Prochaska and their Trans Theoretical Model (TTM).

Figure 3.1: A model for reflection of clinical practice



(Adapted from Balla et al. 2009, p. 967)

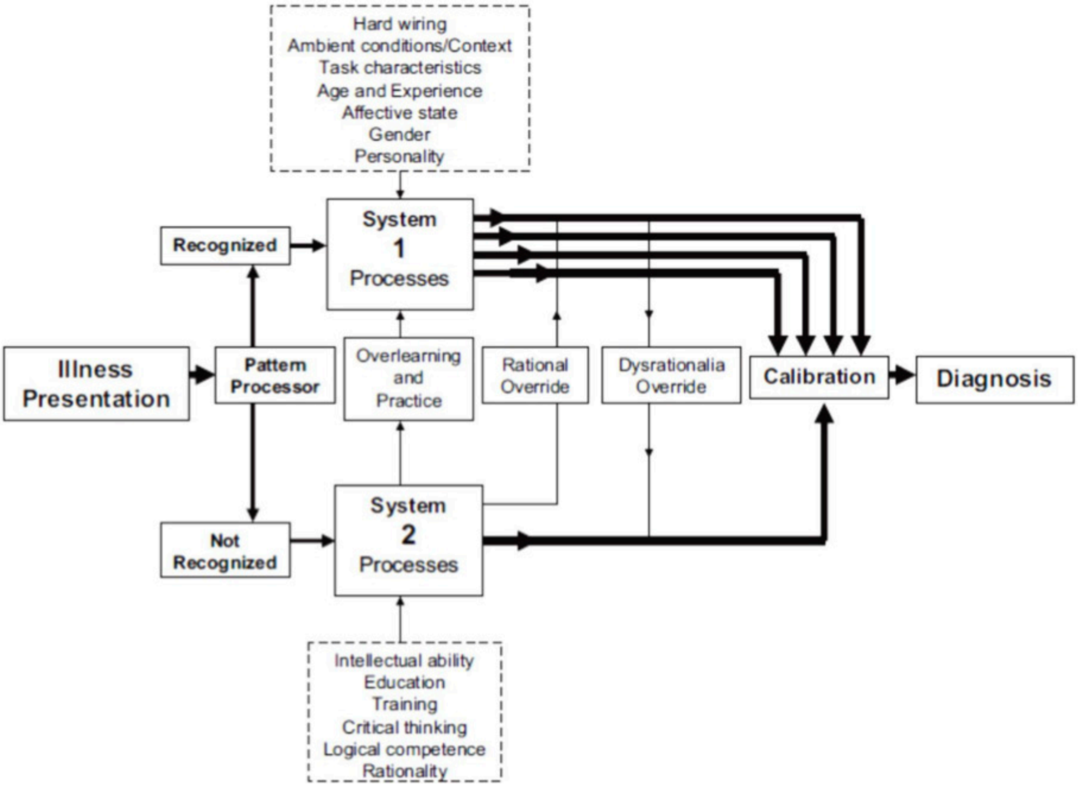
The TTM identified ten stages of change which smokers went through on their way to quitting successfully. This is often interpreted by health professionals as indicating that people move through several stages in a linear formation, but this is not necessarily the case as stages are sometimes bypassed or re-engaged before reaching a new behavioural state.

It is suggested that GP-patient consultations are an embodied encounter in which GPs have to extract details from patients that go beyond salient features and critical cues to enable formulation of a clinical hypothesis and a clinical management decision. These encounters do not necessarily move in a linear process but instead rely on individual differences, cognition and clinical acumen to help the GP navigate other external factors such as the consultation environment, class and cultural disposition. These external factors may be a barrier and exacerbate behaviours through which patients can either unintentionally mislead due to lack of verbalising symptoms or through deceit or lead GPs to misdiagnose through vague or atypical symptoms or lack a practitioners tacit knowledge and experience. As such a more appropriate lens for consideration for medical decision-making may lie within theories where decision-making in practice is embedded within a culture rather than a result of clinical reasoning and decision-making.

To further expand on this discussion Pelaccia, Tardif et al. (2011) describe dual-process theory as a model of reasoning that integrates the major processes of clinical reasoning research and enables a better understanding of how doctors think in practice. Dual process theory has attained a position of dominance over the last two decades due to its application to medical decision-making, and is often depicted through the dichotomies between the two theoretical camps of the intuitive and the analytical. The dichotomous nature of these two approaches highlights the complex task confronting GPs when thinking, reasoning and making decisions regarding treatment and management of patients. Balla, Heneghan et al. (2009, p. 965) posit a "rapid, faster, automatic and effortless dynamic within system 1 and see within system 2 a slow, serial, effortful, controlled, rule-governed dynamic". They describe the different approaches thus: "System 1 frames the context for further thinking about the case, decisions to be made and defines outcomes. Instant recognition depends on perceiving salient features of the presentation that will be associated with a mental model built up from past experience and theoretical knowledge. This leads to a limited search for more cues. System 2 represents reasoning through the initial response vis-à-vis the rules provided by the theory of the profession and may lead to correcting or overriding system 1" (Balla et al. 2009, p. 964). Balla et al., in their UK study of thirty-five GPs and their clinical decision-making using interviews involving recently seen clinical cases, concluded that dual process theory highlights critical steps in decision-making which allows for recalibration of knowledge and hypothesis testing by individuals within the decision-making process. The authors demonstrated how GPs made rapid framing of problems based on salient features prompting the intuitive system 1, and then a further recalibration through hypothesis testing using additional collected information which is consistent with working within an analytical process or system 2. The GPs were therefore using clinical knowledge and making intuitive judgements within the context of the patient consultation and creating a dynamic decision-making process within both paradigms. However, what is important to recognise within clinical knowledge is the validity of the presenting features which informs clinical judgement. This can prove a difficult task when faced with vague and less salient features, for example with regard to lung cancer, or when collecting additional information from a patient who may undervalue their symptoms or purposefully deceive. Balla's argument about dual theory being a link between rational models of decision-making and what clinicians actually do is clear and helps further understanding about clinical thinking within a general practice context. What is less clear within the study was the consideration of wider parameters involving the pressure on time and resources which can be a factor within a GP-patient consultation. For example the authors do not examine the additional time needed for GPs to continue their search for critical cues to allow for the reformulation of a hypothesis. Other limitations of the study are the lack of discussion regarding experience and the lack of clarity in the GP sample which does not highlight the differentiation of participant experience. This may have led to a potential bias to how the participants acted upon and verbalised their responses on recent clinical cases.

Croskerry highlights the different facets of dual theory and the two systems suggesting that the initial presentation of illness is either recognised or not by the observer. Croskerry states: “if it is recognised, the parallel, fast, automatic processes of System 1 engage; if it is not recognized, the slower, analytical processes of System 2 engage” (Croskerry, 2009a, p. 1024). Determinants of System 1 and 2 processes are shown in dotted-line boxes in Figure 3.2 and highlight that repetitive processing in System 2 can lead to recognition and a default to System 1 processing. It is suggested that either system can override the other passing into a form of calibration to then create an interaction that may or may not occur to produce the final diagnosis.

Figure 3.2: Model for diagnostic reasoning based on pattern recognition and dual-process theory.



(Adapted from Croskerry, 2009a, p. 1024)

The model by Croskerry has a utility for general practice and for GP decision-making within the diagnostic consultation because of its speed and automatic processes. It highlights the importance of GP experience and tacit knowledge as well as their clinical and diagnostic acumen which are all important facets that interact within the patient consultation and may help GPs navigate what are often complex and uncertain diagnostic situations. GP experience is an important factor to consider as they may revert to consciously or unconsciously framing the patient consultation quickly, often due to time or patient-driven factors. Croskerry's argument for advocating dual theory is that the framework creates a process for both intuitive and analytical paradigms to be used and can help understand clinical performance and diagnostic error. However, he also recognises that dual theory doesn't fall neatly into either system, and instead suggests a "cognitive continuum with oscillation occurring between system 1 and system 2" (Croskerry, 2009a, p. 1025), which may result in variation of clinical performance and diagnostic accuracy, a suggestion confirmed by Pelaccia, Tardif et al. (2011) who highlight how studies have shown, in both novice and expert physicians, that using purely analytical or purely non-analytical strategies leads to lower diagnostic performance than when participants were asked to use a combination of both processes.

This intuitive decision-making within a patient consultation is described in the literature as pattern recognition or gestalt effects. This is often due to the repetition of seeing many clinical cases and a leaning towards more experienced and time served GPs. Pattern recognition provides an interesting area for exploration within general practice with the potential of cognitive bias due to the repetitive nature of clinical cases and the volume of patient consultations. This leads to examining the intuition paradigm within dual process theory.

3.2.1.1 Intuition paradigm

It is important we clarify the different facets of intuition to establish further understanding of the theoretical underpinning of the intuitive paradigm. There are a number of descriptions of intuition as a concept from the medical literature. One can argue that there is some agreement across each of the descriptions highlighting its rapid or fast properties and that it is a process that people are often unaware is occurring.

Intuition has been described as follows:

> ‘It is generated without effort and is below the threshold of perceptible consciousness’ (Hogarth, 2005)
> ‘The intuitive system is particularly rapid’ (Kahneman, 2003)
> ‘Intuition refers to rapid, unconscious processing and low control’ (Hamm, 1988)
> ‘Intuitive processes are so fast that one just knows or acts without being aware where the thought or action comes from’ (Dreyfuss and Dreyfuss, 1986)
> ‘Intuitive thinking is explained in terms of the high accessibility of the immediate thoughts’ (Kahneman, 2003)

According to Croskerry (2009a, p. 1022), “the intuitive approach leans heavily on the experience of the decision-maker and, therefore, uses reasoning that depends on inductive logic”. Within intuition, inductive reasoning considers inductive judgments which Heit and Rotello (2010, p. 805) argue “would be particularly influenced by quick heuristic processes that tap into associative information about context and similarity”. This does not make an argument logically valid, however, whereas deductive judgements are influenced by more analytical reasoning which may be viewed as slower, more deliberate and more accurate. Within the intuitive paradigm, gestalt effect or pattern recognition is also another important facet through which, suggests Klein (1999), experienced decision-makers can recognise patterns in the information presented and act accordingly, inferring that some actions may be already cognitively primed through recognition. This is further contextualised by Norman (2006, p. 2252) who posits the idea that “expertise in medicine, as in any craft, derives from both formal and experiential knowledge. The process of pattern recognition, so characteristic of an expert’s approach, is a product of extensive experience with patients overlaid on a formal knowledge structure”. Dinant (2004) argues that within medicine these processes are not well understood and relatively under-researched amongst doctors especially as these situations of decision-making are important characteristics of medical practice. However, in contrast the role of intuition in diagnostic reasoning has been extensively investigated in nursing and results show that it is an integral part of a nurse’s decision-making and based on expert knowledge (Rew et al., 2007).

A further consideration is that of rationality. The Oxford English Dictionary defines rationality as 1) based on or in accordance with reason and logic, 2) able to think sensibly or logically, 3) having the capacity to reason. According to Simons (1972, p. 161) rationality “denotes a style of behaviour that is appropriate to the achievement of the given goals, within the limits imposed by given conditions or constraints”. Bounded rationality, according to Girgerenzer and Selton (2002, p. 6), “means rethinking the norms as well as studying the actual behaviour of minds as well as organisations”. Herbert Simons first coined the term “bounded rationality” in 1956 which in principle recognises the limitations of the human mind in solving complex problems. He suggests that “a great deal can be learned about rational decision making […] by taking account of the fact that the environments to which it must adapt possess properties that permit further simplification of its choice mechanisms” (Simons, 1956, p. 129). The inferences drawn from this suggest the focus for bounded rationality is how a decision or judgement may be reached rather than an outcome of that decision or judgement. Marewski and Gergerenzer (2012, p. 78), state “if people were omniscient, that is, if they could compute the future from what they know, how would they behave and how should they behave”.

According to Thompson and Dowding (2009) the limitations of human beings when it comes to instrumental rationality can be summarised as:

1. Problems of attention: time and the ability to focus one's attention on too many things at once means decision-making is often about searching and attention rather than choice per se
2. Problems of memory: individual and organisational memories are not like bank vaults in which memories are stored cumulatively and able to be withdrawn at will. Memories are constructs; our storage capacity is finite and recall is flawed
3. Problems with comprehension: synthesising, summarising and organising information to infer beyond what is simply experienced is difficult for humans. The relevance of information is often unnoticed; the connections between elements in a situation go unconnected. Coherent interpretations of the decision problem and solution are thus more difficult than they need to be
4. Problems of communication: communicating information, particularly complex information is difficult. The problem is compounded by specialisation (or the 'division of labour' in the language of sociology) as differentiation of knowledge, competence and language means that different groups make sense of decision problems differently.

(Thompson and Dowding, 2009, p. 57-58)

Intuition or system 1 also lends itself to what is described in the literature as heuristics and cognitive bias and matches the fast and frugal (efficient) methods described by Gigerenzer and Todd (1999). Clinicians use many such shortcuts in clinical reasoning. According to Norman (2009, p. 747) "shortcuts are typically correct and allow them to arrive at a working diagnosis with the minimum of delay, while avoiding excessive testing and anxiety". Cognitive psychologists refer to such strategies as "heuristics", describing them as 'cognitive short cuts' or 'rules of thumb' that are used to reason and solve everyday situations, sometimes using thin slicing sampling i.e. relying on instinctive first impressions. However, these are also susceptible to biases and errors. Cognitive bias is defined as thinking patterns based on observations and generalisations. Human decision-making within a GP consultation involves a complex set of dynamics and heuristics may be seen as a facilitator to reduce this complexity by applying a rule of thumb, making an educated guess, or using one's common sense. Heuristics are considered useful and even necessary, though critics focus on diagnostic error. The work by Kahneman and Tversky examined cognitive short cuts as a way of reducing complexity within tasks and assessing probability and predicting values to clinical situations (Tversky and Kahneman, 1974). According to Thompson and Dowding (2009, p. 66) “most short cuts serve clinicians well and can get close to the ‘optimal’ solution”. This assessment process is also identified by McWhinney (1997) who describes the use of clinical dichotomies as a starting point in the diagnostic process, e.g. urgent, non-urgent or physical pathology, non-physical pathology. Andre, Borgquist et al. (2003), whose study examined the use of rules of thumb in general practice, describe a link between theoretical knowledge and practical experience.

Within the literature there are numerous areas of discussion debating and defining heuristics. Table 3.2 shows examples of different heuristics, though this is not a comprehensive list. It is also worth noting that the heuristics identified in table 3.2 have a number of limitations.

Table 3.2: Selective pitfalls leading to missed diagnosis and corrective strategies

Circumstance and Pitfall	**Classic definition**	**Corrective strategies**	**Clinical maxims**
Availability heuristic	Judging by ease of recalling past cases	Verify with legitimate statistics	Pay attention to base rates: “If you hear hoof beats think about horses not zebras”
Anchoring heuristic	Relying on initial impressions	Reconsider in light of new data or second opinion	Think beyond the most favoured: “If the patient dies unexpectedly, what would it be from?”
Framing effects	Being swayed by subtle wording	Examine case from alternative perspectives	Deliberately consider from another angle “Let’s play devil’s advocate…..”
Blind obedience	Showing undue deference to authority or technology	Reconsider when authority it more remote	Tactfully reconfirm human work (in case of human authority) assess test accuracy (in case of technology)

Circumstance and Pitfall	**Classic definition**	**Corrective strategies**	**Clinical maxims**
Premature closure	Espousing narrow minded belief in single idea	Return to case when refreshed (if clinical pace allowed)	Give consideration to extremes: "What's the diagnosis that I don't want to miss?"

(Adapted from Redelmeier, 2005, p. 119)

According to Norman et al. (2009) the availability bias considers that the probability of an event (or diagnosis) occurring is rated higher if it can be related to a case easily recalled from memory. Redelmeier (2005) highlights the importance of the availability heuristic because of its applicability in making a decision or diagnosis by the ease with which previous examples or past experiences spring to mind, however there is a risk associated with availability heuristics which may lead to a missed diagnosis and medical error. The framing effect is where patients are swayed to give answers to questions which can support a diagnosis because of the way in which a particular question has been asked. An example of framing effects is described by Redelmeier of a study by McNeil, Pauker et al. (1982) in which participants were asked to choose between surgery and radiation for lung cancer treatment. The main finding was that respondents' decisions to elect surgery increased from 58% to 75% when the information was framed in survival rather than mortality terms.

There is the confirmation bias which directs the line of questioning towards confirming the diagnosis under consideration instead of investigating evidence which may refute it. The consequence of these biases can be an inaccurate diagnosis due to premature closure of questioning without the critical data having been completely collected. There is a school of thought that these limitations often involve overconfidence in an individual's decision-making or an overestimation of the accuracy of an individual's knowledge. For example, the anchoring heuristic is also used as a second shortcut to clinical reasoning. This relies heavily on first impressions or one patient trait or a single piece of information when making decisions. It defines an initial reference point and then adjustments are then made based on additional information. These reference points and adjustments are intrinsic to establishing an understanding of the numerous situational factors that can influence decision-making within the context of general practice. Furthermore, heuristic and fast and frugal (efficient) methods of decision making and problem solving are not without controversy, and a study by Lichenstein and Fischhoff (1977) suggests that overconfidence in decision-making and problem solving can lead to systematic biases and error. Elstein (2009) infers that a clinician's intuition is not perfect and that rational analytic thought can be time consuming, while acknowledging that time is one thing that GPs often don't have due to the number of patients they see on a daily basis. One perspective is posited by Greenwald and Banaji (1995), in which they describe analytic reasoning as being defined as good and intuitive reasoning being defined as bad. This is in contrast to Thompson and Dowding (2009, p. 67) who argue there is a school of thought that "sees the use of heuristics as a positive side of the human condition". However, as Croskerry (2009b, p. 33) points out, for physicians "there is often an imperative to blend the two approaches in the interests of time and resources, [and they] can benefit from clear instruction on the operating characteristics of each system, their merits and disadvantages, so that an optimal calibration may be achieved". The inferences that may be drawn from Croskerry's comment suggest some form of traversing between the different modes depending on prevailing conditions or the salient features at presentation. If the salient features are recognised by a GP, one can assume system 1 may be initiated with immediate effect, however, for lung cancer this may be less straightforward and more complex as some lung cancer features can be ambiguous or vague and are thus sometimes interpreted by the patient as less important (Corner et al., 2006), creating a complex decisional paradigm for the GP and an increased risk of diagnostic error. In contrast to vague presentations, the literature also highlights how common symptoms that can be aligned to seasonal or self-limiting illnesses are symptoms of lung cancer that may affect clinical decisions. This creates complexity and uncertainty and so by blending both approaches their relevant properties may be considered. However, in order to deal with uncertainty, doctors often over-emphasize the importance of diagnostic tests, at the expense of the history and physical examination, believing laboratory tests to be more accurate (Cahan, Gilon et al., 2003).

3.2.1.2 Analytical paradigm

At the other end of the decision-making spectrum is the analytical paradigm. The analytical approach consists of diagnostic and deductive reasoning, normative reasoning, unbounded rationality, robust decision-making involving hypothesis testing and where critical thinking is more logically sound. Normative reasoning is derived from standards or criterion models and is used to help individuals be rational decision-makers. Normative theories provide benchmarks for clinical decisions to be compared against in order to help gauge accuracy. These use statistical methods and rules to help calculate the probability of patients having a particular condition (Jungermann, 1999). Normative models help individuals conform to logical and rational ideas of quality (Thompson and Dowding, 2009). Bayesian thinking is a formal normative model for calculating probabilities of the likelihood of a particular disease. It can be used for calculating the potential of a patient having a particular problem when considering factors involving signs and symptoms of the presenting problem, knowledge of the prevalence of the disease in a particular group and the strength of evidence presented to the GP.

Diagnostic reasoning is identified as an analytical process used to determine patient health problems. Within dual process theory the analytical is depicted as system 2 which is viewed as the slower, more formal hypothesis generation and within a rational decision-making context (Croskerry, 2009a). Norman (2009, p. 40) posits system 2 thinking as “conscious, logical, and a contextual. It places heavy loads on working memory and is seen as energy-intensive”. The comparisons between the normative decision-making and analytical paradigm are often highlighted by the increased reliability and reduced error and bias of the latter. Norman (2009) points out that some authors such as Elstein and Schwartz and Croskerry assume that errors result in cognitive bias, which are associated with System 1. He cites Croskerry, (2006, p. 720): “System 2 [analytic]… can be seen as the superego of decision-making, fighting off the primary impulsivity of system 1 [non-analytic] in favour of reality testing, analytic judgment, meta-cognition and affect tolerance.” This approach leads to examining in more detail hypothetico-deductive reasoning to help further understand the ‘super ego of decision making’. Studies examining clinical reasoning have suggested individuals go through a number of phases in their thinking processes or clinical work up to developing and formulating a hypothesis. The hypothetico-deductive approach to medical decision-making involves several stages: cue recognition or cue acquisition, hypothesis generation, cue interpretation and hypothesis evaluation (Tanner, Padrick, et al., 1987; Elstein et al., 1978). The first phase of the process or cue acquisition as it is described is the gathering of clinical information about the patient. This information can be collected by viewing past medical history and considering current presentation and symptom and potential diagnosis. Following this, the possible formation of a hypothesis may be drawn with some initial explanations considering clinical information gathered, presenting symptoms and visual cues. The next stage then involves the interpretation of the cues gathered and initial explanation of hypotheses, which can be often more than one hypothesis and so classifying them and confirming or refuting within the hypothesis process is important. The final stage is evaluating the pros and cons of each possible hypothesis taking into account all the information gathered and the patient's signs and symptoms until all the evidence is considered and the satisfaction of a clinical judgement is reached. Within hypothetico-deductive reasoning there are some limitations, as Banning (2008) points out, as hypotheses may be incorrect due to the individual's existing knowledge being inaccurate which can lead to inaccurate propositions being tested. Within general practice hypothesis generation is a process intended to assist in managing uncertainty and rare problems by generating a number of hypotheses to allow for further testing and knowledge acquisition. However, in order to deal with uncertainty in general practice, GPs may over-emphasise the importance of diagnostic tests at the expense of the patient history and examination, believing diagnostic tests are more accurate, thus there is potential for delays in a patient's diagnosis and treatment. Croskerry (2009a, p. 1023), proposes multiple branching or arborisation, "… an algorithmic approach using a series of unambiguous branching points and is particularly useful for delegated decision making. Essentially, it is analytic decision making by proxy".

3.3 Medical decision-making in general practice

General practice is characterised by the work of the GP at the front line of healthcare (Olesen, 2000). The initial task in some GP consultations relating to new problems is two-fold: to understand the patient's experience of the illness and to categorise the patient's illness into a diagnosis (McWinney, 1997). Fraser, (1999, p. 36) points out "when patients present with new problems, attempting to arrive at a diagnosis is perhaps the single most important consultation task for a doctor in general practice". Thus arriving at a diagnosis within general practice is perceived as a "crucial achievement which opens the way to prognosis and treatment" (Royal College of General Practitioners, 1972). Medical decision-making is a process that general practitioners undertake on a daily basis when they make judgements about the diagnosis or health management of their patients. It involves a complex range of activities underpinned by the GP's individual knowledge, experiences and clinical acumen. According to Mamede, Schmidt et al. (2007) experienced doctors tend to use non-analytical reasoning in routine situations, but can switch to analytical reasoning if needed, particularly in challenging, complex or unfamiliar situations. However, Norman (2006) posits that by the 'expert' stage, clinical reasoning and decision-making is mainly based on intuitive problem recognition, e.g. a search for evidence of an appropriate illness drawn from memory, or intuitive situational responses. The core dimensions of medical decision-making as described by Atkinson, Ajjawi et al. (2011) are: case-specific knowledge, cognitive skills to process data and metacognition or reflective self-awareness. In contrast, a systematic review by Choudhry, Fletcher, & Soumerai (2005), examining the relationship between clinical experience and quality of care found that increasing experience resulted in a decline in performance as measured by a physician's clinical knowledge, adherence to guidelines and in some patient outcomes. Recent research by Stopler et al. (2011) into the role of intuition in general practice found that many GPs experience certain gut feelings within their diagnostic reasoning process regarding patients. These intuitive feelings are described as being "confined within prognostic assessments of the patient's situation and are often accompanied by bodily sensations" (Stopler et al., 2011, p. 197). Weiss (2011) who cites Elstein and Schwartz (2002) describes diagnosis as a process of generating one or more hypotheses, using these to predict what additional findings should be present and undertaking further data collection to test out these hypotheses. As Fraser (1999, p. 36) points out, "it's important to recognise the term diagnosis does not just refer to conventional disease labels; Although identification of disease centred diagnosis is a crucially important consultation task it is not the whole story, as it is necessary to arrive at a patient centred diagnosis and one which includes consideration of the patient's thoughts and feelings concerning the nature of the potential causes".

3.3.1 Error in medical decision-making

Rubin, George et al. (2003) characterise healthcare as a reliance on human operators who work with increasingly complex technology and variable levels of uncertainty which implies errors are inevitable and may have serious consequences for life. What is an error exactly? In the Institute of Medicine report (1999) "To Err Is Human: Building a Safer Health System', a definition has been proposed based on James Reason's original concept of human error and it was defined as 'the failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim'" (Institute of Medicine, 1999, p. 1). According to Hall (2002) the literature on medical decision-making and clinical reasoning recognises that human beings are subject to cognitive biases and potential diagnostic errors through the use of heuristics or shorts cuts. Croskerry (2009b) suggests that medical error is more common within the intuitive system when compared to the analytical system. The study by Graber, Franklin et al. (2005) highlight 74% of all diagnostic errors as having some cognitive basis. Graber describes diagnostic error through a taxonomy which includes no-fault error, system-related error and cognitive factors. He describes no-fault errors as masked or unusual presentations of disease or patient-related, implying that a patient may be uncooperative or disingenuous. System-related errors involve technical failure, equipment problems or organisational flaws, and cognitive error represents an individual's faulty knowledge, faulty data gathering or faulty synthesis. Due to the context of general practice which involves diverse patient presentations, large volumes of patient consultations and often limited time, there may be a higher prevalence of no-fault errors compared to other areas of medical practice. This potential for higher no-fault error rates may increase the threat of liability and present the possibility of GPs adopting counter liability approaches and becoming more defensively-oriented as practitioners.

3.3.2 Defensive medicine in general practice

Summerton (2000b, p. 565) defines defensive medicine as "the ordering of treatments, tests, and procedures for the purpose of protecting the doctor from criticism rather than diagnosing or treating the patient". Veldhuis (1994, p. 28) defines defensive medicine as "a deviation, induced by a threat of liability, from what the physician believes is, and what is generally regarded as sound medical practice". However, her discussion on widening the concept of defensive medicine highlighted some unanimity over the meaning of defensive medicine. Whilst in the US defensive medicine is a major problem in health care due to the need for doctors to protect themselves from lawsuits, Velduis highlights findings from Dutch family practice studies that suggest that defensive medicine has little to do with the fear of lawsuits and more to do with interpersonal relationships and preventing problems between the doctor and patient. This led to a study by Summerton (2000b) designed to re-examine trends in negative defensive medicine in general practice. The study involved a questionnaire of 500 GPs in which sampling was achieved by choosing every fortieth name of an alphabetical ordered listing of GP members of the Medical Defence Union. The study objective was to re-examine negative medical defensive practice and highlight any significant changes over the past five years. The findings from the study suggest that there was an adverse trend in negative defensive medical practice. However, Summerton points out that most primary care research focused solely on treatment but complaints are mostly associated with diagnostic failure involving a missed malignancy. This finding is similar to conclusions drawn by Graber, Franklin et al. as discussed earlier and what they describe as the different classifications involving cognitive error or no-fault errors.

3.4 Medical decision-making in general practice relating to potential cancer symptoms

According to Summerton, Rigby et al. (2003), diagnosing cancer in primary care is difficult. There is often a reliance on symptoms and the use of guidelines which can ignore the context of primary care. Many cancers can present with common symptoms such as persistent cough or non-specific abdominal pain, yet few patients with such symptoms turn out to have cancer (Summerton, 1999) creating a layer of complexity for GPs. Symptom recognition is one important aspect with GPs searching for salient features or cues to inform the generation of a hypothesis which they may then test. GPs need to be able to calculate which patients within a relatively unselected population have a higher likelihood of malignant disease (Summerton, Rigby et al., 2003). However, as already discussed in chapter two, vague symptoms, unusual presentations, co-morbidities and the insidious nature of some tumour sites mean that cancer diagnoses are often fraught with difficulties and complexities. However, Summerton advocates that primary care practitioners are in a unique position to look beyond the classical features of clinical history and identify more readily available information such as changes in an individual's behaviour to contribute in the identification and diagnosis of malignant disease. The case-control study by Summerton, Rigby et al. (2003) examined practice consultation patterns over a 3-year period leading up to the diagnosis of an internal malignancy within a single rural research, teaching and training practice in the North of England. The purpose of the study was to examine GP consultation patterns during three years leading up to the diagnosis of oesophagogastric, breast, lung prostrate or bladder cancer amongst practice patients. The study's findings highlight how the odds of cancer rose in tandem with increases in average time between new consultations, and were more significant for breast cancer. The inferences drawn from the findings indicate people who wait for a long period between consultations and are infrequent attenders were more likely to have an increased risk of cancer.

3.5 Summary of chapter

To summarise, the literature on medical decision-making is varied and often confusing with a plethora of synonyms describing decision-making within medicine. The examination of the different systems between analytical and intuition demonstrates the challenge within general practice for GPs to get to the right diagnostic decision. The literature highlights experience as a factor that may influence GPs to adopt a more intuitive approach to decision-making due to the cognitive biases that occur over time. Inferences that could be drawn from this suggest there is a potential increase in error or misdiagnosis due to the availability and anchoring heuristics that draw GPs to a premature closure of the patient consultation. These potential cognitive biases alongside unusual and masked presentations of lung cancer can only compound the difficulty in detecting lung cancer in general practice. However, what is noticeable when searching for literature is there is a dearth of literature which focuses on decision-making within general practice in a lung cancer context which suggests this area is under-researched. This creates an opportunity to add to new knowledge and to existing literature and explore an understanding of GP behaviour and unearth factors that may influence their decision-making within a lung cancer context.

Chapter 4

Theoretical underpinnings of qualitative research

4.1 Introduction to chapter

The chapter will discuss the underlying philosophical positions of epistemology and ontology and discuss the tenets of both positions. The chapter will then discuss the theoretical aspects of qualitative research as this applies to the research study.

4.2 Introduction to theoretical underpinnings

Ontology and epistemology are the names accorded to the philosophical investigation of the nature of being and knowledge respectively. While ontology is concerned with the nature of reality itself, epistemology explores the nature of knowledge, how we can attain it and particularly the differentiation between opinion and what can legitimately be described as knowledge. Epistemology is often, if technically erroneously, used to describe both (Gomm, 2008). Grix (2002) argues that an ontological position is the starting point of all research, after which the epistemological and methodological positions logically follow. Williams (1996, p. 69), states "all philosophical positions and their attendant methodologies, explicitly or implicitly, hold a view about social reality. This view, in turn, will determine what can be regarded as legitimate knowledge. Thus, the ontological shapes the epistemological".

4.2.1 Ontological position

Ontology concerns theories of reality, what exists and what there is to know about the world. This has immediate importance to this research as the ontological position adopted influences all aspects of social research from conceptual hypothesis to conclusion. For Denzin and Lincoln (2005, p. 22), "ontology raises basic questions about the nature of reality and the nature of the human in the world", while according to Scwandt (2007, p. 190), it "comprises of worldviews and assumptions in which researchers operate in their search for new knowledge". Blaikie (2000, p. 8), describes ontology as "claims and assumptions that are made about the nature of social reality, claims about what exists, what it looks like, what units make it up and how these units interact with each other. In short, ontological assumptions are concerned with what we believe constitutes social reality". Bryman (2001) and Grix (2002) elaborate on this and state that these assumptions can be aligned within the perspectives of 'objectivism' and 'constructionism' (also referred to in the literature as 'constructivism' - both 'constructionism' and 'constructivist' will be used interchangeably within this thesis, dependant on the author discussed). Broadly speaking 'objectivism' is "an ontological position that asserts that the social phenomena and their meanings have an existence that is independent of social actors" (Bryman, 2001, pp. 16-18). The latter (constructionism), is an alternative ontological position that “asserts that social phenomena and their meanings are continually being accomplished by social actors, this implies that social phenomena and categories are not only produced through social interaction but that they are in a constant state of revision” (Bryman, 2001, pp. 16-18). Constructivism is one of the many labels used to denote the current state of qualitative research and it flags a basic tenet of the qualitative tradition in that reality is socially constructed (Robson, 2002); however, it is also commonly called interpretive (Scwandt, 1994) or naturalistic (Lincoln and Guba, 1985). Constructivists are aligned to the relativist tradition and as researchers they aim to consider and understand the multiple social constructions of meaning and knowledge. According to Robson (2002, p. 27), “their methods such as interviews and observation enable them to acquire multiple perspectives to help construct reality”. Bryman posits the opposing difference to the ontological position of contructivism as objectivisim. This is an ontological position that implies that social phenomena confront us as external facts that are beyond our reach or influence and that social phenomena and their meanings have an existence that is independent of social actors (Bryman, 2001 p. 16).

4.2.2 Epistemological position

Epistemology examines and addresses theories of knowledge. Barbour (2013, p. 35), states that “epistemology refers to theories of knowledge, how we can come to know the world, and our ideas about the nature of evidence and knowledge”. According to Mason (1996, p. 13), it is concerned with “the principles or rules by which one decides whether or how social phenomena can be known, and how knowledge can be demonstrated”, while for Maynard (1994, p. 10), epistemology is “concerned with providing a philosophical grounding for deciding what kinds of knowledge are possible and how we can ensure they are both adequate and legitimate”. Bryman (2001, p. 11), states that “an epistemological issue concerns the question of what is (or should be) regarded as acceptable knowledge in a discipline. A particularly central issue in this context is the question of whether the social world can and should be studied according to the same principles, procedures, and ethos as the natural sciences”.

Much is written about epistemological positions. There is some variation on epistemological positions within the literature with some authors placing positivism and naturalism in opposition, while others describe positivism and interpretivism in the same manner. Hammersley and Atkinson (2007) subscribe to the former viewpoint, arguing that the main competing philosophical positions lie between ‘positivism’ and ‘naturalism’, with positivism privileging quantitative methods and naturalism promoting ethnography as the central research method. Grix (2002, p. 178), however, describes competing epistemological positions as contained within the perspectives of ‘positivism’ and ‘interpretivism’. Bryman, (2001, pp. 12-13), defines positivism as “an epistemological position that advocates the application of the methods of the natural sciences to the study of social reality and beyond”. This suggests that the positivist stance is typically associated with quantitative work in the natural sciences and rarely with the social sciences. Interpretivism, however, can be seen as an epistemological position that “is predicated upon the view that a strategy is required that respects the differences between people and the objects of the natural sciences and therefore requires the social scientist to grasp the subjective meaning of social action”. Crotty (1998, pp. 8-9), discusses different epistemologies and the need to identify, explain and justify the epistemological positions adopted in a research process. He cites three positions, which are outlined in table 5.2.

Table 4.1: Epistemological perspective

Epistemology	Espoused philosophical principles of ‘what it means to know’
Objectivism	Understandings and values are considered to be objectified in the people we are studying, and if we go about it in the right way, we can discover the objective truth.
Constructionism	There is no objective truth waiting for us to discover it. Truth, or meaning, comes into existence in and out of our engagement with the realities in our world…Meaning is not discovered but constructed…In this view of things, subject and object emerge as partners in the generation of meaning.
Subjectivism	Meaning does not come out of an interplay between subject and object but is imposed on the object by the subject…The meaning we ascribe to the object may come from our dreams, or from primordial archetypes we locate within our collective unconscious, or from the conjunction and aspects of the planets, or from religious beliefs…That is to say meaning comes from anything but an interaction between the subject and the object to which it is ascribed.

(Adapted from Crotty, 1998, pp. 8-9)

A point for discussion in relation to this table is the variation of labels and contradictions within the literature. For example, Crotty describes these three perspectives as epistemological positions but Bryman (2001, p. 16), uses these same terms in relation to ontology stating that “Questions of social ontology are concerned with the nature of social entities. The central point of orientation here is the question of whether social entities can and should be considered objective entities that have a reality external to social actors, or whether they can and should be considered social constructions built up from the perceptions and actions of social actors". These positions are frequently referred to respectively as objectivism and constructionism.

Examining a naturalistic stance, Hammersley and Atkinson (2007, p. 7) assert that "naturalism proposes that, as far as possible, the social world should be studied in its 'natural' state, undisturbed by the researcher". The primary source of data should therefore be 'natural' rather than 'artificial' settings such as experiments or formal interviews. Hammersley and Atkinson cite Matza (1969, p. 5), defining naturalism as "the philosophical view that remains true to the nature of the phenomenon under study". Naturalism draws from a wide range of philosophical and sociological ideas, most notably symbolic interactionism, phenomenology and hermeneutics (these sometimes being collectively labelled 'interpretivisim'). This is because "human actions are based upon or infused by social or cultural meanings: that is by intentions motives beliefs, rules, discourses and values" (Hammersley and Atkinson, 2007 p. 7). However, the term naturalism is not without its shortcomings and this is highlighted by Bryman (2001), who argues that as a term it not only has different meanings but that these meanings may actually be contradictory.

According to Bryman (2001, p. 13), "interpretivism is a term given to a contrasting epistemology to positivism". Bryman's view is that a strategy that respects the differences between people and the objects of the natural sciences is required, compelling the social scientist to grasp a subjective meaning of social action which takes into account the actions or reactions of the individual or people. According to Mason (2002, p. 56), "what is distinctive about interpretive approaches is that they see people and their interpretations, perceptions and meaning and understandings as their primary data sources, with the aim of exploring people's individual and collective understandings, reasoning processes and social norms". Mason cites Blaikie (2000, p. 115): "Interpretivists are concerned with understanding the social world people have produced and which they reproduce through their continuing activities. This everyday reality consists of the meanings and interpretations given by the social actors to their actions, other people's actions, social situations and natural and humanly created objects." An interpretive approach therefore not only sees people as a primary data source, but seeks their perceptions or what Blaikie calls the 'insider view', rather than imposing an 'outsider view' (Mason, 2002, p. 56).

4.3 Application of theory to practice

One result of having navigated this academic journey and experiencing the fluctuations of a systematic process is that the tensions between theory and practice became more evident. It is important to highlight that before embarking on this study the researcher's worldview was pragmatic and focused on efficiency, delivery, and output: very much a practitioner's viewpoint. This meant the relationship between theory and practice was hard to negotiate, given the factors that oscillate the 'real world' of every day practitioners. Naturally, these factors vary and reflect the unique context and the problem being addressed. By way of contrast to the practitioner, the theorist is sometimes viewed by practitioners as one whose focus is on verbalisation rather than delivery: explanation not efficiency. This tension has led me to reflect how theory has influenced my practice within this research inquiry. To deconstruct the theoretical process to a simplistic form, the student argues it is about building things underpinned by a set of models, methods and rules that we implicitly follow. Theory provides rules but it does not tell us how to apply them, a decision is often left to individual's practical judgement. Theory also helps us consider how we shape and create social meaning, meaning with which we may construct a social reality. It is then the researcher's role to interpret this social reality and present it in a form that is applicable and understandable. It is this exposure to application, utility and theoretical abstract gained by the researcher that bridges these two spheres to pose questions and address the research questions being explored and developed.

Having examined the merits of theories from an epistemological and ontological perspective it is suggested that the approach of taking parts from these theories and models and adapting them to fit within a working situation is both pragmatic and theoretical. It is the researcher's role to adapt to the context of their study and to develop an applied approach that addresses the research inquiry.

To summarise, it is the ontological and epistemological position of the researcher that helps shape the question they seek to ask and it is these positions that influence how questions are posed and the methods used to answer them. Within the ontological orientation this research study follows a constructivist paradigm with the aim of understanding the multiple social constructions of meaning and knowledge and from that construct the reality (Robson, 2002) whilst also recognising the 'social phenomena and categories are not only produced through social interaction but that they are in a constant state of revision' (Bryman, 2001, p 16-18). From an epistemological orientation the nature of the research aligns itself within an interpretivist and also naturalistic perspective to the world. This meaning of naturalism is taken to recognise that people attribute meaning to behaviour and are authors of their social world rather than passive objects (Bryman, 2001). The theoretical orientations adopted will address the research aims and objectives which are to identify factors influencing GPs in the referral and recognition of suspected lung cancer. The overall purpose is to identify potential modifiable factors in order to develop interventions in the future to enable GPs to recognise and refer patients with lung cancer with greater efficiency.

4.4 Application of theory to this thesis

Because of the nature of this research study the student's philosophical position is firstly from an interpretivist perspective which is the interpretation of human action or hermeneutics (Bryman, 2001). From an ontological orientation the students approach follows a constructivist paradigm, and as Walliman, (2006, p. 37) states it is about "viewing the perception of social reality as a constantly shifting product of perception". Thus, the research study was approached within an interpretive constructivist perspective which is viewed as more appropriate for this research inquiry and enables the student to answer the research questions and gain a deeper understanding of the phenomenon under study. The relevance of the study's philosophical position enables the student to gain an understanding about human beings which are often complex and can be unpredictable and irrational. The interpretative approach purports to be an examination and study of people and their perceptions with the aim of exploring people's individual and collective understandings (Mason 2002) Therefore, in order to answer the research questions it was concluded that the most effective method would be the use of in-depth interviews. This will form the major focus of the research inquiry, namely to explore and obtain depth and richness of insight into GPs attitudes and views regarding the referral, recognition and diagnosis of lung cancer, and to understand what influenced their decision-making processes and why. It is a method that is pragmatic and lends itself well to capturing and understanding GP behaviour as the inquiry aims were to understand what they did and thought in their consultations. Given the nature of the topic area of lung cancer and the potential sensitivities this method enables participants to respond to these themes openly. The student aims to unearth what GPs do in a consultation, an aim which goes to the heart of their professional activity, and so in-depth interviews and the think aloud method are considered to be best suited to answering the research question. There was also the need for pragmatism in the recruitment and engagement process within general practice. It is often difficult to recruit, organise and co-ordinate focus groups within this professional group due to work commitments and the nature of general practice business. In addition to the interviews, the application of the think aloud method was also intended to capture participants' cognitive processes using clinical case scenarios which allow detailed examination and understanding of participants' clinical decisions. The results will be synthesised with the view to examining patterns, relationships and contrast in order to establish credibility of the key findings. Both methods will form part of the triangulation of the research findings and help uphold its credibility and trustworthiness. As Mays & Pope (2000, p. 51) state, "triangulation compares the results from either two or more different methods of data collection/the researcher looks for patterns of convergence to develop or corroborate an overall interpretation".

Barbour (2003, p. 113), describes interviewing as the 'gold standard' of qualitative research and how it is viewed both an art and a science. Further clarification of why the student has adopted this methodology is provided by Hammersley and Atkinson (2007, p. 8): "In order to understand people's behaviour we must use an approach that gives us access to the meaning that guides their behaviour. Fortunately, the capacities we have developed as social actors can give us such access."

Positioning the research within naturalistic and interpretivist epistemology and constructionist ontology was viewed as the most appropriate. This position will enable access to GPs and their types of pragmatic thinking, as well as interpret their perceptions and reported experiences which will help the construction and comprehension of their social realities. This philosophical stance is also influenced by the student's own position within the research subject, as determined by such factors as personal or familial history, previous experience, career or training. Or, as Denzin and Lincoln (2013, p. 23) point out: "behind these terms stands the personal biography of the researcher who speaks from a particular class, gender, racial, cultural and ethnic community perspective". In addition, Denzin and Lincoln (2013, p. 26) also state that "all research is interpretive; it is guided by a set of beliefs and feelings about the world and how it should be understood and studied. Some beliefs may be taken for granted, invisible, only assumed, whereas others are highly problematic and controversial. Each interpretive paradigm makes particular demands on the researcher, including the questions that are asked and the interpretations that are brought to them". So, in order to answer the research questions the student has adopted a interpretive constructivist position and utilised qualitative research.

4.5 Overview of qualitative research

Qualitative research is a “research strategy that usually emphasizes words rather than quantification in the collection and analysis of data” (Bryman, 2013, p. 380). Qualitative research aims to generate in-depth accounts from individuals and groups by “talking with them, watching their behaviour, and analysing their artefacts (such as diaries, meeting minutes, and photographs) and taking into account the different contexts in which they are based” (Kuper et al., 2008, p. 405). Researchers who use qualitative methods seek a deeper understanding of the social world. As Mason (2002, p. 1) points out, “qualitative research can explore a wide array of dimensions of the social world, including the texture and weave of everyday life, the understandings, experiences and imaginings of research participants”. She also describes a loose, working definition of qualitative research in which she advocates the following features:

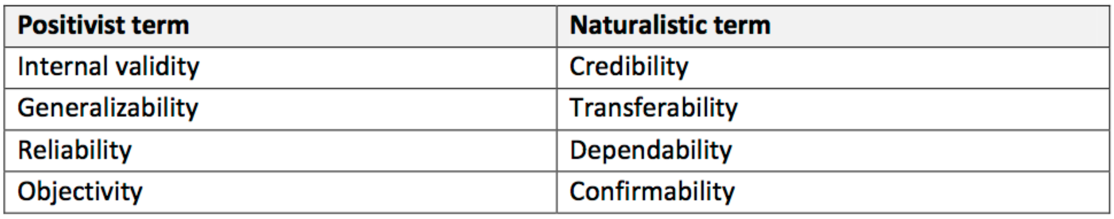
- Grounded in a philosophical position which is broadly interpretivist, in the sense that it is concerned with how the social world is interpreted, understood, experienced, and produced
- Based on methods of data generation which are both flexible and sensitive to the social context in which the data are produced (rather than rigidly standardised or structured, or entirely abstracted from real-life contexts)
- Based on methods of analysis, explanation and argument-building which involve understandings of complexity, detail and context? Qualitative research aims to produce rounded and contextual understandings on the basis of rich, nuanced and detailed data.

(Mason, 2002, p. 3)

4.5.1 Credibility, trustworthiness and rigour in qualitative research

The earliest formulation of a list for criteria for assessing qualitative research is that formulated by Guba and Lincoln (1989), in recognition that positivist criteria (internal/external validity) were inappropriate for the assessment of a ‘naturalistic inquiry’. Table 4.2 illustrates Guba and Lincoln’s criteria.

Table 4.2: Parallel Quality Inquiry



Positivist term	**Naturalistic term**
Internal validity	Credibility
Generalizability	Transferability
Reliability	Dependability
Objectivity	Confirmability

(Adapted from Guba and Lincoln, 1989)

Hammersley (2002, p. 75), describes the basis of credibility as establishing transparency, and “ways in which we monitor our assumptions and the inferences we make on the basis of them, and investigate those that we judge not to be beyond reasonable doubt”. There is a plethora of paradigms that interact with the concept of credibility within a qualitative inquiry. These paradigms are still frequently criticised due to the “unscientific” nature of addressing a particular phenomenon. Mays and Pope (1995, p. 105) explain that within the “health field and its strong tradition of biomedical research using conventional quantitative methods, qualitative research is often criticised for lacking scientific rigour”.

4.5.2 Credibility

Winter (2000, p. 1) considers that “the concept of credibility is not a single, fixed or universal concept, but in highlighting the variation in dialogue and relevant perspectives this establishes credibility”. The definitions that underpin credibility consider the importance of transparency and incorporate truth, value, consistency, and neutrality (Lincoln and Guba, 1985). This acts as validation between the researcher’s interpretations of the findings and if these findings answer the research question in a credible, reliable and transparent manner. It is also important to consider truth. Charmaz (2004, p. 983) posits truth as being about “gaining multiple views of the phenomenon which strengthens the power of our claims to understand it, and the truth from one standpoint becomes rhetoric when viewed from compelling evidence flowing from another standpoint”.

Credibility, transparency and trustworthiness are terms used to describe the extent to which findings generated from qualitative research are legitimate; quantitative researchers often refer to this as internal validity (Kuper et al., 2008, p. 405). Validity is concerned with the integrity of the conclusion that is generated from a piece of research (Bryman, 2001, p. 29). Golafshani (2003, p. 602), highlights that some qualitative researchers have argued that the term validity is not readily applicable to qualitative research while simultaneously accepting the need for some kind of qualifying check or measure for their research. As a result, many researchers have developed their own concepts of validity and have often generated or adopted what they consider to be more appropriate terms, such as, quality, rigour and trustworthiness (Lincoln & Guba, 1985; Seale, 1999; Stenbacka, 2001).

In qualitative research, Anderson (2010, p. 2), posits “the need for assessing credibility and reliability by the extent of the interpretation of the data being supported by convincing evidence”. According to the Critical Appraisal Skills Programme, (2006) terms such as rigour (thoroughness and appropriateness of the use of research methods), credibility (meaningful, well presented findings) and relevance (utility of findings) are used to judge the quality or “trustworthiness” of a study. Trustworthiness, as described by Lincoln and Guba (1985), looks to clarify how an enquirer can persuade his or her audiences (including self) that the findings of an inquiry are worth paying attention to, worth taking account of and what arguments can be mounted. Within the remit of trustworthiness Lincoln and Guba (1985), pose four questions:

- Truth value: how one can establish confidence in the truth of the findings
- Applicability: how can one determine the extent of the findings are applicable in other contexts
- Consistency: how the findings of an inquiry would be repeated and similar findings replicated in the same contexts
- Neutrality: how can the findings of the inquiry not be influenced by bias, ideologies and motivations of the inquirer or researcher?

(Lincoln and Guba, 1985, p. 290)

The concept of trustworthiness, as described by Lincoln and Guba (1985), plays an important role in qualitative inquiry if individuals support the idea that high quality qualitative research must have retained reflexivity. The trustworthiness paradigm contributes to the rigour and introduces an ‘emic’ context and the researcher’s ability to capture an insider perspective and to represent that perspective accurately. Emic can be defined as relating to or involving analysis of cultural phenomena from the perspective of one who participates in the culture being studied, or as Pike (1954) describes, the emic approach focuses on cultural distinctions meaningful to the members of a given society and only the native members of a culture can judge its validity.

4.5.3 Reflexivity

Reflexivity requires a demonstration by the researcher that they are aware of the socio-cultural position they inhabit and how their value systems or ideologies might influence the collection and analysis of data (Grbich, 1999). According to Kuper et al., (2008, p. 405) to consider a reflexive approach is to “enhance the researchers’ recognition of

> their own influence on their research, for example how their gender, ethnic background, and social status influence the choices they make about methods, data collection, and analysis" and since the researcher will be the primary "instrument" for data collection and analysis, reflexivity is deemed essential (Glesne, 1999; Merriam, 1998; Stake, 1995). Carter and Little, (2007) suggest that to be a reflexive researcher involves engaging a theory of knowledge and illustrating the way in which this theory permits the creation of new knowledge though the analysis and interpretation of research data.

4.6 Chapter summary

This chapter has discussed the epistemological and ontological positions taken by the study, which is defined as being broadly 'interpretive constructivist' in nature. To clarify, the subject and object emerge as partners in the generation of meaning from social settings or events that are guided by a set of beliefs and behaviours. The study's methodology is described as using qualitative inquiry and the most appropriate methods for data collection. The research strategy used in-depth qualitative interviews to gain a deep and rich understanding of GP attitudes, beliefs and knowledge regarding lung cancer. An interview approach captures and enables the examination of GP views, experiences and attitudes and how they respond to the research questions within the context of the GP's own individuality and practice. The think aloud method allows for the examination of the cognitive processes of GPs, why they make certain clinical decisions and what influences those clinical decisions. So, in seeking to answer the research questions the student has utilised qualitative research and specifically in-depth interviews and think aloud methods. These approaches and the specific rationale for their use are discussed in more detail in chapter 5.

Chapter 5

Research methods

5.1 Introduction to the chapter

The research methods section will provide a detailed account of the thesis methodology, the methods employed in data collection, analysis and an explanation of the research process. This research seeks to answer the following question: What factors influence GPs in the recognition and referral of suspected lung cancer? The aim is to examine the clinical decision-making of GPs, and to seek to understand their individual attitudes, knowledge and cognitive processes with regards lung cancer and the factors that influence its diagnosis. The chapter will describe the research methods used in this study, most notably open ended in-depth interviews and think aloud clinical case scenarios.

5.2 Justification of method selection

The discussion relating to the methodological implications and decisions starts with the need or relevance of the question or problem being addressed. This 'question led' research points to the most appropriate method in seeking to answer the question posed. Much of the extant literature distinguishes between two primary types of research when discussing methodological issues: quantitative and qualitative.

Table 5.1: The philosophical differences between quantitative and qualitative positions and their orientations.

	Quantitative	**Qualitative**
Principal orientation to the role of theory in relation to research	Deductive; testing of theory	Inductive; generation of theory
Epistemological orientation	Natural science model in particular positivism	Interpretivism
Ontological orientation.	Objectivism	Constructionism

(Bryman, 2001, p. 20)

Whilst the table above describes the fundamental differences, Mantzoukas, (2004, p 1004) states "quantitative inquiry adhering to the positivist paradigmatic rules signifies that there will be a minimization of individual involvement and representation to the point that it would appear as if the research has created itself and can exist independently, without the input of either the researcher or the reader. On the other hand, qualitative inquiry adhering to the non-positivist paradigmatic rules signifies that the research is a creative product of a specific individual, the researcher, and that he or she, admittedly, has had a catalytic influence throughout the whole endeavour".

Within chapter 4, section 4.3, the student clarifies his ontological and epistemological positions to influence how questions are posed and methods used to answer them. The research study follows an interpretive constructivist paradigm that enables the constructions of social reality and the interpretive attributes meaning to perceptions, behaviour and understanding of social norms. Thus, the most appropriate approach is often dictated and directed by the nature of the research question and the phenomenon under study, as noted above. In this case the nature of the research question and the phenomenon under study, being the individual attitudes, knowledge and cognitive processes of GPs during the diagnostic process, pointed squarely to the need for a qualitative inquiry. Two different methods have been used in this thesis in order to answer the research questions: open ended interviews; and think aloud clinical case scenarios. A qualitative approach will enable the capture of GPs attitudes and beliefs and an exploration of the themes, patterns and relationships that interact across the organisation and culture. The methods are particularly suited to exploring the participant's understanding and views on a particular topic more openly and gaining depth of perception into sensitive topics through probing. Choosing the think aloud method allows the insight into the cognitive processes and decision-making of participants to be gained that would not have been possible with a quantitative paradigm.

This study takes place within a complex research arena. A number of decisions were made in relation to the selecting of the most appropriate methods to best answer the research questions. Consideration was given to other methods involving an ethnographic approach and participant observation but they were considered to be overly problematic within a health care setting. As Bryman (2001, p. 294) states "one of the key and yet most difficult steps in ethnography is gaining access to a social setting that is relevant to the research problem in which you are interested".

Other alternative approaches in addressing the research questions were also explored. Whilst Bryman (2001) points out that interviews are the most widely employed method for qualitative research, other methods involving focus groups were also considered as an approach to answering the research questions. A brief examination of the strengths and weaknesses of in-depth interviews and focus groups may clarify the methodological position and further justify the decision to use in-depth interviews.

The respective advantages and disadvantages of the interview and focus group approaches as described by Stokes and Bergin (2006) are presented below:

Table 5.2: The advantages and disadvantages of interviews

Advantages	**Disadvantages**
Flexible and adaptable of finding things out	Interviewing is time consuming
It offers the possibility of modifying one's line of enquiry and following up interesting responses and investigating underlying motives	Interviewing is more expensive than other methods of research due to logistics and processes involved in each interview
It has the potential of providing rich and highly illuminating material	

Table 5.3: The advantages and disadvantages of focus groups

Advantages	**Disadvantages**
A highly efficient technique for qualitative data collection and the amount and range of data are increased from several people at the same time	The number of questions covered is limited.
Natural quality controls of data collection operate: participants tend to provide checks and balances on each other	Facilitating the group process requires considerable expertise
Group dynamics help focusing on the most important topics and it is fairly easy to access the extent to which there is consistency.	The interview process need to be well managed or the less articulate may not share their views, extreme views may predominate and bias may be caused by one or two members
Participants tend to enjoy the experience	Conflicts arise between personalities and power struggles may detract from the interview
The method is relatively inexpensive and flexible and can be set up quickly	Confidentiality can be a probe between participants
Participants are empowered and able to make comments in their own words while being stimulated by other in the group	The results cannot be generalizable as they cannot be regarded representative.
Contributions can be encouraged from people who are reluctant to be interviewed on their own	The live and immediate nature of the interaction may lead a researcher or decision maker to place greater faith in findings
People who cannot read and write or who have other specific difficulties are not discriminated against	
Facilitation can help in the discussion of taboo subjects since less inhibited members may provide mutual support	

(Tables 5.2-5.3 Cited by Robson, 2002, p. 285, adapted and abridged from Robinson, 1999, pp. 909-10)

In short, focus groups have extrinsic advantages such as speed and cost, while in-depth interviews have intrinsic advantages relating to the quality and depth of the research outcome. Both methods bring differing qualities within the qualitative paradigm.

To summarise, the methods chosen for the research are inextricably linked to the research questions posed and to the sources of data collected. Thus, the research question and the phenomenon understudy which is exploring GPs knowledge, attitudes and cognitive processes clearly points to a qualitative inquiry. A number of methods were explored to answer the research questions, including focus groups, in-depth interviews and observational approaches. The merits of the different methods have been highlighted and advantages and disadvantages described. A pragmatic view was taken given the resource constraints to enable the student to gain an in-depth understanding of GP views, knowledge and decision-making regarding lung cancer.

5.3 Overview of in-depth qualitative interviews

The term ‘qualitative interviewing’ is usually intended to refer to in-depth, semi-structured or loosely structured forms of interviewing (Mason, 2002, p. 62). The interview is probably the most widely employed method in qualitative research (Bryman, 2001, p. 319). An individual in-depth interview can be defined as “an unstructured personal interview which uses extensive probing to get a single respondent to talk freely and to express detailed beliefs and feelings on a topic” (Webb, 1995, p. 121), or as “conversations with a purpose” (Burgess, 1984, p. 102). According to Stokes and Bergin (2006, p. 6), “the advantages of individual in-depth interviews relate to the quality and depth of the research outcome”. The strength of in-depth interviews is well documented in the literature and Stokes and Bergin (2006) describe the advantages of this method as falling into three broad categories:

- Circumstances of unique applicability, especially those involving sensitive or personal topics (Robson and Foster, 1989)
- Sampling advantages including greater control over respondent selection and hence more depth, context and flexibility in the process of inquiry (Cassell and Symon, 2004)
- Preferential outcome, in terms of the depth and comprehensiveness of information that they can yield (Hedges, 1985).

Webb, (1995) listed specific preferential outcomes:

- It is possible to ascribe the views to individual respondents, allowing for more precise interpretation

- It affords the opportunity to build a close rapport and a high degree of trust, thus improving the quality of the data
- It allows for easier expression of non-conformity.

(Stokes and Bergin, 2006, p. 6)

Unique applicability resonates strongly within health research, and particularly within this inquiry, as participants would view their own response to recognition of potential lung cancer symptoms as a sensitive and a personal topic to examine and explore. Reasons for this sensitivity include the GP ‘missing’ a diagnosis which can lead to personal angst and introspection, and also frustration from the patient. However, some criticism of individual in-depth interviews highlights how they miss out on the advantages and benefits of interaction with other consumers or participants (Robson, 1990). In qualitative interviewing skilful probing is often encouraged as this enables deeper insight into what the interviewee views as relevant and important. The skill is to remain within the interview topic but probe into the reasons why people say the things they do, to get at the underlying meaning. As a result qualitative interviewing tends to be “flexible responding to the direction in which the interviewees take the interview and adjusting the emphasis in the research process as it is important in qualitative interviewing, the researcher gets rich detailed answers” (Bryman, 2001, p. 320). Mason (2002) highlights that qualitative or semi-structured interviewing share the following core features:

- The interactional exchange of dialogue. Qualitative interviews may involve one-to-one interactions, larger group interviews or focus groups and may take place face-to-face or via the telephone or the internet
- A relatively informal style, with the appearance in face-to-face interviewing of a conversation or discussion rather than a formal question and answer format
- A thematic, topic centred, biographical or narrative approach, where the researcher has a number of topics or themes or issues which they want to cover, a set of starting points for discussion or specific stories which they wish the interviewee to tell. Most qualitative interviews are designed to have a fluid and flexible structure to allow for the researcher and interviewee to encompass themes that may develop in unexpected directions
- Most qualitative research operates from the perspective that knowledge is situated and contextual and the job of the interview, therefore, is to ensure that the relevant contexts are brought into focus so that situated knowledge can be produced. Most would agree that knowledge is at the very least reconstructed, rather than facts simply

> being reported in interview settings. According to this perspective, meanings and understandings are created in an interaction which is effectively a co-production involving researcher and interviewees.
>
> (Mason, 2002, p. 62)

5.4 Development of in-depth interview topic guide

The development of the topic guide was informed by the objectives of the research study and through examining the literature and guidance from supervisors. The topic guide was used as a framework for discussion within the in-depth interviews. As Bryman (2012, p. 472) explains, "the idea of an interview guide is much less specific and the term can be employed to refer to a brief list of memory prompts of areas to be covered that is often employed in unstructured interviewing or to a more structured list of areas to be addressed". In the student's case the latter resonates with the aim to capture all the areas that are to be addressed via the various questions which were posed to the participants. The topic areas that were covered included questions involving the consultation, patient related factors, practice and GP factors, as well as external factors involving policy or screening programmes. As with the clinical scenarios, the topic guide was piloted within early interviews to allow for refinement and amendments. There were a number of refinements within the early part of the fieldwork, primarily within the starting questions regarding 'thinking about lung cancer', and midway through the fieldwork changes to questions involving attitudes towards lung cancer were made. These later changes were made in response to a better understanding of GP attitudes regarding lung cancer and breast cancer and views on the often depressing statistics of lung cancer. (See Appendix 3 for the full topic guide). The use of the topic guide also ensured that participants were asked similar questions which enabled comparisons and thematic analysis of the data to be carried out across all participants. However, the nature of semi-structured in-depth interviews allows for the unexpected to be explored and this flexibility gave the student freedom to probe further when new themes of discussion occurred naturally within the interview. It also allows for modification of the topic guide and its prompts.

The structure of the topic guide was developed with four broad headings which were; consultation factors, patient factors, practice factors and external factors. At the start of the interview the opening questions discussed were within the context of a patient consultation which enabled participants to establish an understanding of the discussion. The questions ranged from the general, "How often do you think about or consider lung cancer" to the specific, "Tell me about the last patient you can remember diagnosed with lung cancer – how she/she presented, and the role of primary care". More sensitive questions regarding personal attitudes towards lung cancer and how individual viewpoints can impact on lung cancer were asked further on in the interview, by which time it was hoped that participants felt comfortable and a rapport had been established.

5.5 Overview of think aloud

There are several reasons why the think aloud approach was chosen over other methods. Firstly, it is argued that although in-depth interviews would address some of the research questions posed, the student felt that the in-depth interviews alone would not give the necessary insight into GP decision-making. Secondly, ethnographic methods which are often associated with illuminating the social context and sit within an interpretivist paradigm alongside focus groups and interviewing were viewed as too challenging due to the practicalities of access, while obtaining of relevant consents may have created further issues and potential delays to the progress of the research. Think aloud methodology was chosen from the qualitative techniques available as it was considered the best way to approximate the ethnographical approach while understanding GP decision-making as deeply as possible.

In this study the student addresses the questions of how GPs are involved in the initial recognition and referral of lung cancer, and what decisions they make within the context of a consultation. As decision-making is a key component within the consultation, the think aloud method enables the student to gain a deeper understanding of that process. The research aims to unpack the decision-making process by examining factors relating to patients, medical knowledge and guidelines and rules..

The think aloud method has its roots in psychological research and is used to capture cognitive processes and is used to understand an individual's decision-making process. Skånér (2005, Methods), describes think aloud as one of a number of "process-tracing techniques that are used to study the cognitive processes involved in decision-making, such as, for example, how judgements change over time as new information is presented, and which decision rules are used". According to van Someren et al. (1994, p. 29), think aloud was developed from "the older introspection method which is based on the idea that one can observe events that take place in consciousness, more or less as one can observe events in the outside world". The think aloud method consists of asking people to articulate their thoughts while solving a problem and analysing the results. This method has applications in psychological and educational research on cognitive processes. The value of data obtained from the think aloud method is based on the assumption that what is verbalised represents the thought processes of individuals. Fonteyn, Kuiper et al. (1993, p. 431), state that "(a) the cognitive processes that generate verbalisations are a subset of cognitive processes that generate any type of recordable response or behaviour, (b) human cognition is information processing, a sequence of internal states successively transformed by a series of information processes". From a methodological perspective Fonteyn, Kuiper et al. puts forward the argument for the use of think aloud as a method that contributes to understanding reasoning, cognitive processes and problem solving. They suggest that the use of a systematic way to code specific verbalisations as a process to analyse verbal data using protocol analysis adds credibility and accuracy to findings and is validated by step by step verbalisations that are coded, explained and are traceable. Skaner et al. (2005) also argue that the traceable process within think aloud gives accuracy to verbalisations and transparency to findings. Their study investigated general practitioners from Sweden in relation to their diagnostic reasoning for patients with potential suspected chronic heart failure (CHF). The study findings are of particular interest to the student as it describes "Information about other relevant diseases was frequently used in the GPs' diagnostic reasoning, indicating that they often relied on illness scripts", (Skaner et al. 2005, p. 9). The latter part of the finding which highlights the reliance of an 'illness script' is of particular interest. Firstly, if GPs place high emphasis on the illness script then there may be implications to knowledge verbalised and may skew participants level of awareness of symptoms. Secondly, the prescriptive delivery of the clinical case scenarios may not reflect a true patient encounter where symptoms are not articulated clearly by the patient. It is these challenging patient encounters that rely on the skill of the GP to navigate the patient's presenting symptoms and attempt to extract details that may be of more concern or that require action.

As described in chapter 3, section 3.2, clinical reasoning plays an important role within the context of a patient encounter which often requires the generation of a clinical hypotheses, and drawing upon existing knowledge, associations and experience is part of the consultation process. It also informs other kinds of medical decisions including those concerning interpretation of the presentation and management of treatment as well as referral decisions.

The think loud method is used to capture a sequence of thoughts and information that participants verbalise from their working memory, assuming the working memory has the capacity to process and operate quickly giving an immediate response. This may have disadvantages as the verbalised content may be drawn only from the working memory and not from participants longer term memory and general knowledge. It could be argued this may reduce the participant's ability to dual process and traverse between intuitive and analytical processes when medical decision-making. As think aloud requires concurrent verbalisations the lack of introspection and retrospection may not be captured from participants. However, according to Lundgren-Laine (2010) the working memory operates as a processing unit between short-term and long term memory. Moreover, this research has been coupled with data from the in-depth interviews that commenced immediately after the case scenarios so it is argued that this additional qualitative lens complements the description of participant's diagnostic reasoning and problem solving on a range of complex clinical case scenarios.

The think aloud method is a unique source of insight into cognitive processes which is collected by instructing people to problem-solve while saying 'what goes through their head', stating directly what they think. Problem-solving is the progressive exploration of a question for which one does not have a direct answer available. The answer cannot be directly retrieved from memory but must be constructed from information that is available in memory or that can be obtained from the environment (van Someren et al., 1994). Charters (2003, p. 70), states that "researchers need to be aware that even thinking aloud, which makes inner speech external, cannot reveal deeper thought processes in their true complexity because they have to be simplified into words before anyone, even the thinkers themselves, can really know them. This 'bottleneck' between the breadth of abstract thought and the narrower, temporal emergence of verbal thought necessarily slows down thought processes". However, this method has also many disadvantages. Some academics have criticised the fact that thinking aloud and the limited capacity of memory may impact on cognitive processes of the participant, thus affecting performance if the scenarios involve highly complex information requiring a lot of cognition (Lundgren-Laine, 2010). The student also argues that if the verbalisations are drawn from participants' working memory and not from their longer term memory this does not allow for participants to apply duel processing when medical decision-making, thus reducing levels of verbalised clinical hypothesis. There is also the question of what impact 'illness scripts' have within the context of clinical case scenarios. It is argued by the student that this superficial context may not reflect a true patient encounter which often requires the skill of the GP to extract symptomatic and relevant information to make a more informed medical decision.

To summarise, the think aloud method is a way to analyse cognitive processes and can be applied to medical decision-making. The process involves traceable techniques such as step-by-step coding, explanation and analysis supports the credibility of findings. The method promises to be fruitful for understanding how and why GPs reach their decisions in response to the varying complexity of patients presenting with potential lung cancer symptoms. The think loud technique allows the researcher insight into how GPs solve problems when they are presented with clinical case scenarios.

However, there are disadvantages to think aloud, firstly verbalisations are drawn from the working memory and not from the deeper longer term memory which limits dual processing and also can influence verbalisations if complex information requires high cognition and secondly, the very nature of clinical case scenarios, a technique used to capture participant verbalisations, means they could be viewed as a superficial 'illness script' and not truly reflect a patient encounter, thus creating a caveat of participants' knowledge and awareness of symptoms.

5.6 Development of the think aloud clinical case scenarios

The first step within the think aloud process was to develop clinical scenarios that would reflect realistic patient presentations that participants could work through while verbalising their clinical decisions. Four different scenarios were considered appropriate. The reasons for developing four clinical scenarios were varied. They were based on levels of complexity and the potential of a differential diagnosis. It was also anticipated there may be a large amount of data generated from the think aloud scenarios. There were also pragmatic reasons, as the analytical process may be very time consuming, and financial constraints, as resources were limited allowing only enough to compensate their practices for one hour of an individual GP's time using the National Institute of Health Research rates. In developing the four clinical scenarios the student sought first to define the content that would obtain a deeper understanding of what participants think about, and processes by which they come to a decision, when met with clinical situations involving symptoms associated with lung cancer.

Each scenario aimed to establish a clinical situation and include relevant symptoms in line with current NICE guidelines, evidence from the literature and the student's own experiences working in public health to give it context and believability. Each scenario included patient factors involving gender, age, and occupation as well as a social context. Smoking status and the patient's presenting complaint were also included in the scenarios. Each scenario was positioned to reflect a level of risk involving symptom recognition and then designed to create an appropriate response or clinical decision. The positioning of each of the scenarios was developed with guidance from the student's two supervisors. This level of risk started at what would be seen as 'barn door' or 'classic' lung cancer presentations through to more complex clinical situations where there was a potential for the making of different diagnoses or pursuing other clinical directions. The clinical scenarios were lent further realism through observations made by the student in previous qualitative research activity within a lung cancer context in Hull; this included adding a patient background and social history. Additional information was provided to give the clinical scenarios some context by using past medical history and appointment history. Similar to the interview topic guide the four clinical scenarios were piloted on the first few participants in order to consider their utility and to make revisions following participant feedback after the interview. There were minor revisions with some participants commenting on their familiarity and their ability to relate to the patients in the scenarios through previous experience. However, one observation made within the pilot phase was the reorganisation of the interview schedule and recognition of when to implement the clinical scenarios either pre or post open-ended interview. The first two interviews were delivered with the open-ended interviews at the start followed by the application of the think aloud clinical case scenarios. There was a concern the initial discussion about lung cancer might have influenced the GP's thinking when it came to responding to the clinical case scenarios. Other factors involved fatigue and having been interviewed which was seen as an intensive process created low energy levels over a period of time. A decision was made to alter the interview schedule and to implement the clinical scenarios' pre-interview questions enabling the student to capture GP's cognitive processes 'cold'.

5.7 Setting

The majority of the in-depth interviews were conducted within GP's own practice environment, often their own consultation room. However, due to logistical and access issues five participants were interviewed in third party environments; in hospital, educational or sub-regional NHS organisational settings that were organised and pre-booked. The in-depth interviews were completed across four geographic areas in the North of England: Hull, East Riding of Yorkshire, North Lincolnshire and North Yorkshire. Each interview varied in time with the majority lasting between fifty and eighty minutes.

5.8 Recruitment and sampling

The recruitment process began with a number of participants being identified via the Northern and Yorkshire Primary Care Research Network (PCRN) within Hull and the surrounding East Riding of Yorkshire areas. Using the PCRN facilitators the research study was able to reach and engage practice managers and sometimes directly with GPs dependant on practice relationship to mention or highlight the research. These proved useful contacts resulting in four GPs being recruited. However, a number of limitations were also observed when utilising the PCRN facilitators, these included:

- The student's research funding for the project was not a portfolio project so did not have the same gravitas or receive the same importance compared to other research projects which were included in funding portfolios. As there was no formal contract in place with the PRCN facilitators to actively promote the research project, it was deemed less of a priority compared to other projects and more of an internal favour to promote it
- PCRN facilitators seemed to have aligned their relationships and engagement priority with the majority of practice managers. This enabled the practice managers to act in a gate keeper role and potentially create barriers for engagement and recruitment
- PCRN facilitators had access to only research active practices which increases a potential bias in recruiting a diverse range of participants.

The gatekeeper role and the negotiation to access closed settings is similar to that described by van Maanen and Kolb (1985, p. 11), who state that "Gaining access to most organisations is not a matter taken lightly but one that involves some combination of strategic planning, hard work and dumb luck".

Obtaining a copy of the GP practice details from Primary Care Trusts for all localities proved the most useful when it came to recruitment of GPs. Initially, north locality GP practices in Hull and in East Riding of Yorkshire were selected for recruitment. The criteria for recruitment involved gender, practice size, location, local socio-demographics and lung cancer incidence. The decision to focus on these two localities initially was also influenced by other research studies in the area which were also recruiting GPs. A decision to target different localities was mutually agreed with another researcher to prevent potential confusion amongst the general practice community of the differing pieces of research. The initial engagement strategy took the form of an email to the practice manager and, if that and a number of follow-up mails proved fruitless then a direct letter with reply slip and separate participant information sheet explaining the background of the research was sent to each and every GP in the practice. The rationale for not doing the latter initially was etiquette, and to try and involve the practice manager in the research programme and to utilise their potential influence within the practice to recruit participants.

5.9 Sampling strategy

Sampling is an important component of qualitative research which can have implications for generalisations. Mason (2002, p. 120), states "the broadest definition of sampling and selection are 'principles and procedures used to identify, choose, and gain access to relevant data sources from which you will generate data using your chosen methods'". The goal of qualitative sampling is not to produce a representative sample, but rather to reflect diversity (Mays and Pope, 1995) and to provide as much potential for comparison as possible. According to Bryman (2008, p. 415), "The goal of purposive sampling is to sample cases / participants in a strategic way, so that those sampled are relevant to research questions that are being posed". One form of purposive sampling is theoretical sampling as advocated by Strauss and Corbin (1998). Mason (2002, p. 124), states that "In its more general form theoretical sampling means selecting groups or categories to study on the basis of their relevance to your research questions, your theoretical position and analytical framework, your analytical practice, and most importantly the argument or explanation that you are developing".

In order to achieve the research objectives a purposive sampling strategy was conducted as part of the planning phase and research design. This was to provide evidence relevant to the aims and objectives of the study and gain the viewpoints from a range of participants from practices with differing characteristics. It was initially proposed that approximately thirty to forty in-depth interviews would be conducted, as it is unusual for in-depth qualitative studies to be larger than this, although recruitment would continue until data saturation was reached and there was nothing new being communicated and there were no more new themes emerging.

GPs were selected initially on the basis of practice characteristics which included size and geography (urban or semi-rural/rural). Other characteristics included Social Economic Status (SES) of the local population which is served by the practice. These data were obtained from local public health teams of the localities and also derived from the student's prior experience of working in the Hull and East Riding locality. These data became less significant as the research moved beyond its two original localities in search of more participants. The study gained additional approval to recruit participants from North Lincolnshire and North Yorkshire. Following on from the initial interviews, the GPs selected were to include both genders and experience was to be established at the end of the interview process. The experience of a GP was assessed relative to their date of qualification, falling into one of two categories: up to 10 years since qualification; and more than 10 years since qualification. The rationale for applying the selection criteria was to examine and compare any potential differences in decision-making and explore any potential differences in knowledge, views and attitudes towards the referral and diagnosis of lung cancer that may relate to gender and/or experience.

The recruitment of sufficient numbers using the initial sampling strategy of GPs and their practice characteristics proved difficult to achieve. It is unclear why the recruitment drive met with a limited response, but the response may have been related to lack of capacity or interest in the topic area or other competing studies. A pragmatic view was then taken to recruit willing participants who responded to invitations. Whilst this has limitations it still enabled the student to recruit a diverse sample which reflected different practice localities, practice population and participants' individual characteristics. While there was often only one reply from each GP practice in the first instance, 'word of mouth' sometimes led to the recruitment of additional GPs from the same practice following the initial respondent having had a positive interview experience. This process used 'snowball sampling' as described by Bryman (2001, pp. 98-99). (See Appendix 1 which describes participants' practice geography and their individual characteristics). One observation made half way through the recruitment process which occurred organically and emerged covertly from the sampling strategy was the increasing amount of teaching (undergraduate medical students) and training (GP trainees) practices that were willing to participate in the research study compared to non-teaching and non-training practices. Prior to this observation no consideration had been given to educational and non-educational practices as characteristics that may have influenced recruitment. This proved a concern and so efforts were made to recruit more non educational practices in order to help make the data representative of the totality of general practice.

As the focus moved from the initial sampling strategy into a more emergent sample due to limited responses, a GP's gender and experience became less important as the main focus shifted to obtaining sufficient participant numbers. However, it is important to highlight that the sample achieved totalled thirty six participants of whom 23 were men and 13 women. There were nineteen men who had over 10 years' experience and four had less than 10 years' experience. Within the women seven participants had less than 10 years' experience whilst six had over 10 years' experience. In comparison the General Medical Council (2016) indicate there are at total 66,351 registered GPs, 32,658 or 49.2% being male and 33693 or 50.8% female. The sample recruited for this study does not reflect national gender distribution and it was difficult to determine whether the gender differences of the study were representative of the local geographical areas.

The realities of sampling proved difficult and complex, most notably due to time constraints, and so a pragmatic approach was adopted. A decision was made to interview receptive participants who responded to the invitations with the attempt to recruit a diverse sample by filling in the gaps as the sample emerged which reflected the different practice populations and participants' individual differences.

5.10 Data collection and interview process

Interviews were recorded using a digital voice recorder. Each interview was transcribed verbatim relatively soon after recording, but this was an on-going process due to the time taken to recruit and the interview participants. After a number of interviews the topic guide was refined. All interviews were conducted by the student. The interviews were conducted according to individual participant responses and the most convenient date was arranged between the interviewer and the recruited participant.

Before commencement of each interview the participant was briefed again about the scope of the study and given a copy of the participant information sheet and the consent form. Participants were reminded that the interview would be digitally recorded and nothing would be published that could be used to identify them. Participants were told that the data they provided would be reported anonymously. In addition to this participants were offered a copy of a summary of findings taken from the thesis at the end of the research process. Participants were also sent a letter thanking them for their participation in the research and a copy of the four clinical case scenarios that were used within the interview process. This enabled them to provide evidence with regard to their contribution to the study as part of their appraisal and revalidation process.

Written consent for the interview was obtained and the form confirmed that data would be recorded anonymously, and would be available to the student, the student's supervisor and thesis advisory panel members and stored on a password protected HYMS laptop computer and that data would be held in storage for 10 years on a secure server in Hull York Medical School but removed from the laptop once the research was complete. See appendix ? for consent form.

The topic guide was used as initial framework to guide the discussion between the participant and the interviewer, and as such the questions were not implemented in a systematic way but used in a flexible approach to allow for participants verbalising issues from outside the initial scope of the question. The topic guide ensured participants were asked similar questions to potentially allow for comparison and thematic analysis (See appendix 3 for interview topic guide).

5.11 Ethical considerations

Ethical principles of social research tend to revolve around certain issues involving harm, consent and privacy (Diener and Crandall, 1978). The main ethical issues in this study were consent and confidentiality. Both of these were appropriately addressed. Consent was addressed with the use of consent forms and participant information given direct to the participant prior to the interview commencing thus guaranteeing informed consent and an understanding of the nature of the research and process on the part of the participant. Consideration was given to the appropriateness of questions and a conscious effort on behalf of the student with direction from the supervisor to consider the potential implications to sensitive topic areas within the interview process and individuals' possible responses. Confidentiality was addressed through data being anonymised and being stored on a password protected Hull York Medical School laptop. Data from the completed research project would be held on a secure server for ten years in Hull York Medical School. Procedures to be put in place should any data obtained through a qualitative interview be deemed serious enough to have an impact on patient or staff safety, including diagnostic ability or inappropriate/unusual behaviour, were discussed in accordance with Hull York Medical School Ethics processes. For any such instances with the first response involved discussion with the student's supervisors, both experienced academic GPs.

Ethical approval for the GP interviews was sought from Hull York Medical School Ethics Committee and approval to proceed with the research study was granted on the 7th October 2011. The study also gained the necessary approval from the local NHS R&D department for access to all study sites. Additional permission was sought and approval was granted from City Health Care Partnerships CIC which is a local health care provider, originally part of NHS Hull provider services. As of September 2011, NHS Research Ethics Committees were no longer required to approve projects involving staff.

5.12 Data analysis

This section describes the facets of qualitative analysis relating to the open ended interviews. Miles (1979) describes qualitative data sets as an ‘attractive nuisance’, inferring there are many difficulties in navigating through the richness of data and the creation of analytical direction.

According to Bryman (2012), the data analysis stage is about data reduction — reducing the large amounts of collected information so that the researcher can make sense of it. Robson, (2002, p. 459) cites Miles and Huberman (1994, p. 9), who produced a ‘fairly classic set of analytic moves’:

- Giving codes to the initial set of materials obtained from interviews, observations, documentary analysis
- Adding comments, reflections (commonly referred to as ‘memos’)
- Going through the materials trying to identify similar phrases, patterns, themes, relationships, sequences, differences between sub-groups
- Taking these patterns, themes, out of the field to help focus the next wave of data collection
- Gradually elaborating a small set of generalisations that cover the consistencies you discern in the data
- Linking these generalisations to a formalised body of knowledge in the form of constructs or theories.

(Robson, 2002, p. 459)

The data generated in this study were subjected to thematic analysis. Daly, Kellehear & Gliksman (1997) describe thematic analysis as a search for themes that emerge as being important to the description of the phenomenon. The process involves the identification of themes through “careful reading and re-reading of the data” (Rice & Ezzy, 1999, p. 258). It is a form of pattern recognition within the data, where emerging themes become the categories for analysis (Fereday & Muir-Cochrane, 2006). As Bryman (2012, p. 578) notes, “the search for themes is an activity that can be discerned in many if not most approaches to qualitative analysis, such as grounded theory, critical discourse analysis, qualitative content analysis and narrative analysis", he also points out that for some writers a theme is more or less the same as a code, whereas for others it transcends any one code and is built up out of groups of codes.

5.12.1 Coding for qualitative interviews

A code is a symbol applied to a section of text to classify or categorise it and they are typically related to research questions, concepts and themes (Robson, 2002, p. 476). Coding is the starting point for most forms of qualitative data analysis (Bryman, 2012, p. 575). The principals involved in developing codes have been developed by writers on grounded theory. Bryman (2012) highlights Loftland and Loftland (1995) and describes some considerations when developing codes:

- Of what general category is this item of data an instance?
- What does the item of data represent?
- What is the item of data about?
- Of what topic is this item of an instance?
- What question about a topic does this item of data suggest?
- What sort of answer to a question about a topic does the item of data imply?
- What is happening here?
- What do people say they are doing?
- What kind of event is going on?

(Bryman, 2012, p. 575)

Coding frame development commenced after the first initial interviews had been conducted. This began by focusing on each transcript and a 'line by line' interrogation of the data. However, as this was an iterative process with codes being refined as more data were analysed, the quantity of codes created quickly became difficult to manage. Charmaz (2004), argues that this often 'line by line' approach in which many codes are generated means that the researcher does not lose contact with his or her data and the perspectives and interpretations of those being studied. This process unavoidably creates a proliferation of codes.

Robson, (2002) highlights Miles and Huberman, (1994) who distinguish between first and second level coding. First level coding is concerned with attaching labels to groups of words. The second level involves pattern coding groups from the initial codes into a smaller number of themes or patterns. This first and second level process developed organically and systematically as more interviews were conducted and analysed. This was due to the large amount of codes created at the first level and a natural consolidation and management of codes to themes / patterns in the second level.

Applying the initial coding frame manually to a further seven transcripts was undertaken by the student and double-coded by the student's supervisor to establish reliability. This approach is advocated by Barbour (2003, pp. 1025-6) who states "the most experienced qualitative researchers already employ a pragmatic version of double coding through supervision and team meetings. Such a session reproduces in microcosm the process of qualitative research itself, maximizing the analytic potential of exceptions or potential alternative explanations".

The coding framework was then applied manually across the remaining interview transcripts which involved further refining of some codes and creating additional sub-codes. (See appendix 2 for coding frameworks). The coding frame was then re-applied to all transcripts after inputting the data into a qualitative analysis software package (QSR Nvivo 10). This process allowed the student to gain additional familiarity with the data and thus identify any more emergent themes while simultaneously establishing the validation and reliability of the manually coded versions.

Nvivo 10 is a computer-aided software package that supports qualitative and mixed methods of research, and which allows the student to collect, organise and analyse content from interviews, focus groups and other types of research material. The software also enables the student to analyse and aggregate specific codes or 'child' codes of data and then compare the different data sets by applying different attributes and characteristics for example: analysing and comparing gender, experiential and organisational factors.

5.12.2 Thematic analysis for qualitative interviews

Thematic analysis is a term used in connection with the analysis of qualitative data to refer to the extraction of key themes from it. It is a rather diffuse approach with few generally agreed principles for defining core themes in the data (Bryman, 2012, p. 716). However, whilst what can constitute as a theme is not clear cut, it can be described as:

- A category identified by the analyst through his / her data
- That relates to his / her research focus

- Builds on codes identified in transcripts or field notes
- Provides the researcher with the basis for a theoretical understanding of his or her data that can make a theoretical contribution to the literature relating to research focus.

(Bryman, 2012, p. 580)

Bryman (2012), cites Ryan and Bernard (2003), who describe a number of suggestions when searching for themes. Table 5.4 highlights these suggestions.

Table 5.4: A list of suggestions when searching for themes

Repetitions	Topics that recur again and again
Indigenous typologies or categories	Local expressions that are either unfamiliar or are used in a unfamiliar way
Metaphors and analogies:	The ways in which participants represents their thoughts in terms of metaphors or analogies
Transitions	The ways in which topics shift in transcripts and other materials
Similarities and differences	Exploring how interviewees might discuss a topic in different ways or differ from each other in certain ways or exploring whole texts like transcripts and asking how they differ
Linguistic connectors	Examining the use of the words like ‘ because’ or ‘since’, because such terms point to a causal connections in the minds of participants
Missing data	Reflecting on what is not in the data by asking questions about what interviewees, for example, omit in their answers to questions
Theory-related material	Using a social scientific concepts as a springboard for themes

(Cited by Bryman, 2012, p. 580; adapted from Ryan and Bernard, 2003)

While thematic analysis lacks a clearly specified series of procedures, Ryan and Bernard’s suggestions provide some direction with regards beginning to organise data. A similar approach is also advocated by Miles and Huberman (1994), who describe a list of thirteen tactics for generating meaning:

- Noting patterns, themes and trends
- Seeing plausibility - Do the trends, patterns and conclusion make sense?
- Clustering - Grouping events, places, people and processes if they appear to have similar patterns or characteristics
- Making metaphors – Metaphors are rich, data reducing and pattern making devices which help to connect data with theory

- Counting – Helps to enable you to see what's there by counting frequency of occurrence of recurrent events
- Making contrasts and comparisons – Establishing similarities and differences between and within data sets
- Partitioning variables – Splitting variables may help in finding more coherent descriptions and explanations
- Subsuming particulars into the general – Linking specific data to general concepts and categories
- Factoring – Attempting to discover the factors underlying the process under investigation
- Noting relations between variables – Using matrix displays and other methods to study interrelationships between observed variables
- Finding intervening variables – Trying to establish the presence and effects of variables intervening between observed variables
- Building a logical chain of evidence – Trying to understand trends and patterns through developing logical relationships
- Making conceptual / theoretical coherence – Moving from data to constructs of theories through analysis and categorisation.

(Miles and Huberman, 1994, pp. 245-6)

Reading data and generating meaning is an important process within qualitative inquiry and it is vital researchers constantly revisit the research question in order to unearth the themes, illuminate the data and answer the question originally posed. Mason (2002) describes the importance of how far researchers wish to 'read' their data either, literally, interpretively or reflexively. She describes three facets of reading data; these are described in table 5.5.

Table 5.5: Three facets of reading data

Literal readings	Reading your data 'literally' you will be interested in their literal form, content structure, style, layout. For example using interview transcripts you might be interested in the words and language used the sequence of interaction, the form and structure of the dialogue and the literal content. However, most qualitative researchers will not stop there as purely an objective descriptive reading is not possible because the social world is always already interpreted and because what we see is shaped by how we see it.

Interpretive reading	An interpretive reading will involve you constructing or documenting a version of what you think the data means or represents or what you can infer from the data. For example using interview transcripts to make sense of interviewee interpretations and understanding or their versions of accounts of how they make sense of social phenomena or emphasising your own interpretations. There is usually a need to do both to some extent. The form of interpretive reading you adopt will involve 'reading through or beyond the data' in some way.
Reflexive reading	A reflexive reading will locate you as part of the data you have generated and will seek to explore your role and perspective in the process of generation and interpretation of data. You will probably see yourself as inevitably and inextricably implicated in the data generation and interpretation process, and therefore will seek a reading of data which captures or expresses those relationships.

(Mason, 2002, p. 149)

5.12.3 Protocol data analysis for think aloud

According to Austin and Delaney (1998, p. 42), "protocol analysis is a set of methods for obtaining reliable information about what people are thinking while they work on a task". Think aloud studies provide rich data about reasoning during a problem solving task. In this study we address the question of how GPs, who are involved in initial recognition and referral of lung cancer, make such decisions when guidelines are not physically available to them. Past criticism due to inconsistencies in data collection and the laborious process of protocol data analysis has questioned the validity of data findings. However, according to Lundgren-Laine (2010, p. 566) "the main objective in using the think-aloud technique and protocol analysis together is not to judge the outcomes of a participant's cognitive process as either successful or unsuccessful decisions, but rather to explore the process of the performance". The process often involves two phases which are a qualitative phase to develop a coding framework and code and interpreting the data verbalised, followed by a quantitative phase to add weighting to the codes verbalised. Thus, inferring the levels of verbalisation is important. Researchers have sought to generalise participants' verbalisations by identifying numerical patterns. Pressley and Afflerbach (1995, p. 17), in their comprehensive study of think aloud research into reading found that "various types of quantitative analyses were employed in the majority of studies".

Despite the numerous advantages of capturing participant verbalisations, there are also some disadvantages within analysis techniques in this field. The quantitative approach used in this study is not without criticism. The approach which involves counting up verbalised codes to establish a weighting may not reflect participants' deeper, longer term knowledge when developing a medical hypothesis. As Charters (2003) highlights, verbalisations are often drawn from the working memory and not from the deeper memory and may not reflect deeper medical knowledge known by participants. Thus, suggesting verbalisations may not be representative of individual's deeper working memory and knowledge which highlights limitations when applying numerical weighting to participant's utterances. Although, this is difficult to associate as there are other factors to consider with quantification. It is argued that differing styles of verbalisation may affect levels of coding and/or numerical weighting as each participant's thinking processes when expressed out loud may differ in length. However, this effect may be reduced when the verbalisations are aggregated into codes.

This method is not conversational as it is important to reduce social verbal interaction so not to detract from the thinking out-loud and the participant's cognitive utterances. The student's only role is to prompt the participant to keep talking if he or she becomes silent.

Once the verbalisations were transcribed the think aloud transcripts were analysed, a process which involves coding specific segmented verbalisations which represent elements of the participant's cognitive processes. The segmented verbalisations are then broken down to develop a coding framework. The coding framework for this research was adapted from Lamond et al. (1996) and Johnson et al. (2012), and was further developed by the student in agreement with the supervisor. The codes were then applied to each sentence with many sentences having multiple codes attributed to them. The coded sentences were then organised in order and interpreted, and the codes counted to establish numerical weighting of each: the findings are discussed in detail in chapter 7. Charters (2003, p. 74), points out "researchers must be prepared to make their own inferences as they interpret think-aloud data. Many participants' utterances are ambiguous; they may repeat a phrase using various intonations as they search for its meaning, but they do not articulate this speculation".

5.13 Challenges encountered

Recruiting GPs is often seen as challenge due their limited availability and capacity to contribute to research studies and the often overwhelming number of requests they get from the plethora of studies ‘doing the rounds’. What was observed within this recruitment process was the variation involving the gatekeeper role of practice managers who either helped facilitate the research process and actively promoted it internally or potentially delayed the dissemination of the study information to GPs due to other competing factors. This gatekeeper dynamic was overcome by bypassing the practice manager and engaging the GPs directly via a personal letter. This, however, is not the usual course of actions as external organisations often use practice managers as an entry site into the practice as it is seen as a courtesy to approach them first given that their role is often within the business of the practice and research studies usually have financial incentives attached. The other challenges surrounding recruitment were the response rates from teaching or training practices compared to non-teaching and training practices. These are practices that have placements for undergraduate medical students which are often referred to as teaching practices and practices who train post graduate GPs in training are often referred to as training practices. This was noticed midway through recruitment and procedures were put in place to target more non-teaching and training practices in order to obtain a more balanced perspective as teaching and training practices are often seen as higher quality practices.

Interruptions, noise issues and having to change room’s mid-interview were not uncommon problems within the interview process. The noise issue related to the location of the interview taking place which was sometimes due to the consultation rooms being close to a busy corridor in the practice and doors constantly banging. Interruptions from other practice colleagues and urgent phone calls to make to patients were not uncommon midway through the interview and making the interview conditions more similar to that of consultations. In one particular situation the student and participant were asked to change rooms due to the start of an internal meeting. Within fieldwork these situations are often unavoidable and are the nature of research.

5.14 Chapter summary

This chapter has described the rationale for qualitative methods, the processes involved in the topic guide and clinical scenario development, and the importance of piloting and refining questions through the fieldwork process. It has elucidated the sampling and recruitment strategies used involved the Primary Care Research Network facilitators and snowballing through to direct engagement via a personal letter to access and recruit participants. The sampling and recruitment strategy was not without its challenges due to

GPs limited capacity and the student’s time constraints. The methods of data collection used were in-depth qualitative interviews to capture deep and rich insight into participants understanding of the recognition and referral of lung cancer, and applying think aloud strategies to gain a closer understanding of GP decision-making and cognitive processes. The use of thematic analysis for the interviews and protocol analysis for the think aloud process were discussed.

Chapter 6

Findings from the open-ended in-depth interviews

6.1 Introduction to chapter

As described in chapter 5, this study consisted of interviews with GPs in two distinct parts: open in-depth interviews and think aloud interviews using clinical case scenarios. This chapter reports on findings from the in-depth interviews and the following chapter will report on the think aloud analysis. In chapter 8 the research questions are re-visited using both sets of data and the findings are merged.

The student's decision to present the in-depth findings first was to enable the reader to see the think aloud findings in the context of the in-depth interview results which represent a larger body of work. It is important to highlight that the decision to conduct the think aloud portion of the interview first was to try to prevent the in-depth interviews impacting on the think aloud results.The decision to conduct think aloud portion first is discussed in chapter 5 section 5.6 as it was recognised early on in the pilot phase there was the need for reorganisation of the interview schedule. The first two interviews were delivered with the open-ended interviews at the start followed by the application of the think aloud clinical case scenarios. There was a concern the initial discussion about lung cancer might have influenced the GP's thinking when it came to responding to the clinical case scenarios. However, it is argued that the think aloud results are more logically reviewed in the context of the in-depth interview results.

6.2 Participants

Thirty six interviews were conducted in total, with thirty six participants recruited and interviewed between January 2012 and November 2012. It is difficult to state the exact number of general practitioners approached, as the recruitment strategy used many channels, both direct and indirect, involving primary care research network facilitators who liaised with research practices across Hull and the East Riding of Yorkshire, direct email to practice managers across Hull and East Riding, North Yorkshire and North Lincolnshire, personal letters sent to each GP. The sample consisted of GPs working in Hull, East Riding of Yorkshire, North Yorkshire and North Lincolnshire. The other geographical factor that was applied within the sample was whether the practice was positioned within an urban or semi-rural/rural location. The Oxford English Dictionary (2014) definition of urban "is a characteristic relating to a town or city". The definition of rural is "characterised by the countryside rather than the town". The definition of semi-rural "is having both rural and urban characteristics". The rationale behind the use of these variations is supported by previous studies that show differences in lung cancer incidence between urban and rural areas. According to Pearce and Boyle (2005), differences in lung cancer incidence were due to the distribution of socio-economic deprivation and a higher smoking prevalence which is often found in more urban areas. Of the thirty six participants twenty three were male and thirteen were female, twenty one were White British, eleven were Asian, two Black and two European. The participants were then asked about their experience, and were further divided between those fewer than ten years of practice post qualification, as a GP and those with more than ten years of practice post qualification. Of the thirty six participants interviewed, twenty six GPs had over 10 years' experience while ten had less than ten years' experience post qualification.

The geography, location and gender and experience of each participant along with the practice factors is summarised in Table 6.1.

6.3 Development of key themes and sub-themes

The process of analysis has been described in chapter four. Several key themes emerged as a result of this process and within each of these themes a number of sub-themes became evident. These are summarised in table 6.2 and the remainder of this chapter will describe in detail the findings under these headings.

Table 6.2 - A model of key themes and sub-themes from the thematic analysis.

Key themes	Sub-themes
How GPs make decisions	• Awareness of at risk groups • Salient versus challenging features • Analytical versus intuition
The practice culture and structure	• Educational and training agenda • Communication and social structure • Quality and improvement agenda • Internal organisational processes • GPs individual differences
Pressure on general practitioners	• Missing a diagnosis • Complaints • Litigation • System referrals
GP-patient consultations	• Doctor-patient relationships • GP attitudes • Access
Complexity in general practice	• Diversity of patients • Burden of disease

Table 6.1: Participant and practice characteristics

GP EXPERIENCE <10 YEARS >10 YEARS	GP GENDER	SOCIO-ECONOMIC STATUS OF PRACTICE POPULATION	RURAL/ URBAN	TRAINING * TEACHING * PRACTICE	LOCATION
>10	M	AFFLUENT -POCKETS OF DEPRIVATION	SEMI RURAL	TRAINING	EAST RIDING
>10	M	DEPRIVED	URBAN	TEACHING	HULL
>10	M	MODERATELY AFFLUENT - POCKETS OF DEPRIVATION	URBAN	TRAINING	HULL
<10	M	DEPRIVED	URBAN	NO	HULL
<10	F	AFFLUENT - POCKETS OF DEPRIVATION	SEMI RURAL	TRAINING	EAST RIDING
>10	M	DEPRIVED	URBAN	NO	HULL
>10	F	AFFLUENT -POCKETS OF DEPRIVATION	SEMI RURAL	TEACHING	EAST RIDING
>10	M	DEPRIVED	URBAN	TEACHING	HULL
<10	F	DEPRIVED	URBAN	TEACHING	HULL
>10	M	DEPRIVED	URBAN	NO	HULL
<10	F	DEPRIVED	URBAN	NO	HULL
>10	M	AFFLUENT - POCKETS OF DEPRIVATION	SEMI RURAL	TEACHING	EAST RIDING
<10	M	AFFLUENT - POCKETS OF DEPRIVATION	SEMI RURAL	TEACHING	EAST RIDING
>10	M	AFFLUENT - POCKETS OF DEPRIVATION	SEMI RURAL	TEACHING	EAST RIDING
<10	F	AFFLUENT - POCKETS OF DEPRIVATION	SEMI RURAL	TEACHING	EAST RIDING
>10	F	AFFLUENT - POCKETS OF DEPRIVATION	SEMI RURAL	TEACHING	EAST RIDING
<10	M	DEPRIVED	URBAN	NO	HULL
>10	M	DEPRIVED	URBAN	NO	HULL
>10	M	DEPRIVED	URBAN	NO	HULL
>10	F	DEPRIVED	URBAN	TEACHING	HULL
>10	M	DEPRIVED	URBAN	TEACHING	NORTH YORKS
>10	M	DEPRIVED - POCKETS OF AFFLUENCE	URBAN	TRAINING	HULL
>10	F	DEPRIVED	URBAN	TEACHING	HULL
>10	F	DEPRIVED –POCKETS OF AFFLUENCE	URBAN	TRAINING	HULL
>10	F	DEPRIVED	URBAN	TEACHING	NORTH YORKS
>10	M	AFFLUENT	RURAL	TRAINING	NORTH LINCS
>10	M	AFFLUENT	SEMI RURAL	TEACHING	NORTH YORKS
>10	M	MIXED SES	URBAN	TRAINING	NORTH YORKS
>10	M	MIXED SES	URBAN	TRAINING	NORTH YORKS
>10	M	AFFLUENT – POCKETS OF DEPRIVATION	SEMI RURAL	TRAINING	NORTH YORKS
<10	F	AFFLUENT – POCKETS OF DEPRIVATION	SEMI RURAL	TRAINING	NORTH YORKS
>10	F	MIXED SES	SEMI RURAL	TEACHING	NORTH YORKS
>10	M	MIXED SES	URBAN	TRAINING	NORTH YORKS
<10	F	MIXED SES	SEMI RURAL	TRAINING	NORTH LINCS
<10	M	DEPRIVED	URBAN	NO	NORTH LINCS
>10	M	MIXED SES	URBAN	NO	NORTH LINCS
*Teaching = Medical students * Training = Training doctors					

6.4 How GPs make decisions

One of the strongest themes to emerge from the data analysis related to GP decision-making. This theme is perhaps unsurprising given the nature of the main research question and the line of questioning within the topic guide (see Appendix 3). There were several aspects of this theme which emerged from the data which can be considered as sub-themes and will be considered in this section. These were:

- awareness of the at risk groups
- differences between patients presenting with salient features versus challenging features
- variation in analytical versus intuitive approach in the decision making process.

6.4.1 Awareness of at risk group

The majority of participants describe certain patient characteristics which can increase their suspicion of lung cancer and influence their clinical decision making. These include smoking, age, and gender and socio-economic status. A number of participants suggest that lower social economic groups tend to lead unhealthier lifestyles and have a higher smoking prevalence.

> *You tend to think more of your sort of working class, stoical type who's generally got a unhealthy lifestyle or a less than ideal lifestyle as well, and unfortunately it does tend to be that the lower economic group who do tend to smoke more that, also they tend to have other medical problems as well, often depression and anxiety, chronic pain, things like that not, it's just a social thing, so that's my typical, typical lung cancer patient who I'd expect to see walk through the door. ER13M.*

> *Low socio-economic group, I think it's, has, it's, there exists quite high in those associated, I think it's mostly because of the smoking habits, the lifestyle, I think that plays an important part I think.HU17M.*

The above participants ER13M, HU17M highlight the relationship between lower socio-demographics and a view of increased incidence of lung cancer. Other participants describe their awareness of higher smoking prevalence within their practice populations and within their wider community environment which also increases suspicion.

> *It's a quite prevalent area, so we have been surprised on a number of occasions with the diagnosis of lung cancer and in a, in quite unusual, presentations, so I think as the doctors, as the group of GPs we have quite a low threshold for investigating. HU18M.*

> *The population from which lung cancer patients is derived are smokers, they are going to be older patients and they are going to have an array of symptoms. ER01M.*

So, in the minds of these participants the development of lung cancer has been attributed to several environmental and lifestyle factors of which smoking is the most important. There are other factors that were cited increasing the risk of developing the disease and these include age, genetics, diet and being exposed to asbestos, radiation, nickel and environmental tobacco smoke. As one participant describes:

> *So first of all you've got background risk factors and like I said before the big one that would be hanging over me all the time would be a big smoking history but also would think about occupational, you know, dust exposure and asbestos and stuff like that, that's more rare but important industrial causes, but basically the big one is smoking. NY21M.*

Smoking was described by the majority of participants as the most important patient characteristic that they considered relevant in raising suspicion about lung cancer. This concurs with established data on the relationship between lung cancer and smoking as evidenced by the case-control studies undertaken in 1950 linking smoking and lung carcinoma by Doll and Hill. It is estimated that close to 90% of lung cancers are caused by smoking (National Institute of Clinical Excellence, 2011) with factors such as duration and intensity playing a role in its development.

> *I would think about lung cancer any time a smoker comes with a chest related problems, problem. In fact I would think about lung cancer any time a smoker comes with anything probably. NY32F.*

> *Smoking is the biggest thing, the people that smoke, so and there's been so many warnings on cigarette packets and, and I tell people but they continue to smoke and*

> *I say it's poisoning you and it's killing you and they don't, don't want to continue, it's their lifestyle choice. HU20F.*

Conversely, one participant found the difficulty in considering lung cancer with patients who had given up smoking for a very long period time, maybe quitting in their forties, fifties or sixties but had still built up a large number of pack years.

> *I think it's very easy when people have given up in their sixties and you're looking after them in their eighties to forget, you know, you've been to their house and you, I've never seen them smoking, you know, I've never been in a house that's smelt of smoke to, a lot of those are all things which are immediate in your face. So I find those ex-smokers, you, you can forget I think, whereas the people who are actively smoking it's just in there as a constant reminder that you're thinking of cancers of all sorts with them. ER15F.*

The participants interviewed also described age as an important factor. They verbalised an age range between 35-80 years of age with the additional fore-mentioned characteristics who were most at risk. Again this is in keeping with published data. Statistically, lung cancer is more common in older people. Approximately 80% of lung cancers are diagnosed in people over 60 years of age (Cancer Research UK, 2014).

> *We've got a very elderly population, so obviously the older you get the more likely you are to have lung cancer. So with the elderly I would always consider that but with the elderly you're more likely to get secondaries because they're more likely to get other cancers but I would always have that in mind. ER07F.*

> *Long history of smoking, presently smoking, certain age group, I mean any age group can have lung cancer but if they are over fifties, first time presentation with a cough that didn't go away, usually they, they are suspicious themselves isn't it? ER16F.*

Not only is lung cancer more common in people over 40 but it also has a higher prevalence amongst males (Hospital Episodes Statistics, 2011). Many participants considered men more at risk of lung cancer than women. The reason for this may be historical as evidence from the 1960s often demonstrates a much higher smoking prevalence with males compared to females. However, those smoking patterns have changed significantly over the past 40 years.

> *People who've been exposed to smoke over a long period of time, suppose I think about it more, more with men but, but I wouldn't say that's very, very strong, men, think about it in women as much, although, I've seen it more in men. HU23F.*

> *I mean there will be a gender variation in terms of how, prevalence and stuff like that, but I wouldn't use that diagnostically, the main one I'd use diagnostically would be smoker, so it would simply be smoker and particularly long term smoker with a high number of pack years. NY21M.*

The statement by NY21M recognises there is gender variation in the prevalence of lung cancer which is an important factor however, smoking history and number of pack years is used diagnostically. This increased suspicion with regards male patients may also be related to the participant's individual experiences and dealing with stoical men, which may sit high up in their diagnostic memory.

> *Similar to a couple of your cases was a, or, or is, a stoical chap who, again doesn't present to the doctor unless it's turning black and falling off, and he presented with a, what he thought was an infection and a haempotysis.ER13M.*

> *He was reasonably stoical, we've got quite a stoical farming kind of community here, so he'd had three or four months before he came to me, to say, you know, it's getting worse doc, you know, kind of thing.NL26M.*

Whilst the majority of participants highlight stoical males, some participants do recognise that women adopt stoical characteristics.

> *I think you do get stoical women, definitely, but I think that (...) they tend to be stoical in a different way, they tend to be people who've got illnesses who are very stoical about them, rather than that real (.) salt of the earth man that doesn't present very often, you do get women who don't come very often and you take them seriously but I think it's more men.NY25F.*

The statement by NY25F raises the viewpoint on stoic differences between men and women. The participants' statement may be inferred as illness delay (Andersen, Cacioppo et al. 1995) or illness behaviour (Mechanic and Volkart, 1961) from the literature. These concepts are discussed in detail in Chapter two, section 2.5.1.

> *Probably sort of between forties and sixty five, (.) yeah, although you do get some stoical older gentlemen as well who are a bit older who don't want to bother their GP.NY31F.*

> *I think old men don't pres, don't present much, women never think they're going to have lung cancer because it's a man's disease even though now it isn't, so they don't tend to present with chest stuff.NY30M.*

The quote from participant NY30M highlights a perception that men's stoical attitudes create a delayed or late presentation to general practice but it also demonstrates that lung cancer is often perceived as a man's disease. As gender roles and smoking patterns have changed, the number of women being diagnosed with lung diseases-asthma, chronic obstructive pulmonary disease (COPD) and lung cancer is on the rise. Litwin (2013) posits in the 1960s women who smoked, were only 2.7 times more likely to die from lung cancer when compared with women who didn't smoke. Today, this number has jumped to 25.7.

One viewpoint from a participant describes a hypothesis for this warranted focus on males which suggest participants have had more experiences of late stage presentation of lung cancer amongst men and those experiences have remained in the individual's clinical memory.

> *I suppose it's the men who are probably the ones that you remember because they tend to present later and tend to, tend to present worse, the women will present earlier with their, with their symptoms but certainly the, my memory seems to want to think there's a male predominance to it.ER13M.*

In summary the majority of participants seem alert to the risks associated with different socio-demographics. They associate lower working class or manual groups with higher risk of lung cancer. Participants have a higher index of suspicion with patients who smoke and who are elderly but their suspicion is further increased with male patients. Many participants describe a myriad of risk factors together which suggest they are interrelated and alerts their antennae to consider lung cancer.

6.4.2 Salient features versus challenging features

Participants highlight a range of salient features or red flag symptoms for lung cancer describing situations in which they would consider the possibility of lung cancer or the challenging aspects of reaching a lung cancer diagnosis. The phrase ‘red flag’ was used to denote the key important features of lung cancer by many of the participants.

> *I mean obviously if people come with a very good history of weight loss, breathlessness, coughing up blood and have clinical signs that makes it very easy, but I think by that stage you’ve sort of missed the boat a bit really, but, so people, so people presenting you know, with, with a clear history of red flag signs obviously makes it easier.ER15F.*

> *It entirely depends on the presentation of the patient, specially the age is, you know, age is an important criteria, it doesn’t mean that young patients won’t get it but my way of thinking is anybody above thirty five, forty, chronic smoker, persistent cough, or for somebody coming in with real red flags.HU17M.*

The phrase ‘red flag’ was a common expression used by the participants which is suggestive of an immediate warning and adds seriousness to the particular situation. The red flag features which the participants described were:

- haemoptysis
- breathlessness/shortness of breath
- persistent/progressive cough
- weight loss
- chest infection
- hoarse voice
- sore throat
- loss of appetite
- shoulder pain
- chest pain

> *So from a symptom presentation point of view, any patient presenting with (.) prolonged unexplained cough, (.)unexplained breathlessness, unexplained chest pain, (.) the more systemic features of loss of appetite, loss of weight, general malaise and so on, particularly in conjunction with a exposure risk, where, a lifestyle risk to lung cancer, smoking being the most obvious but chemical exposure being another potential hazard. NY27M.*

> *Anyone's got a new onset cough, obviously anyone who coughs up blood, anyone who's breathless, associated with cough or if they've got a persistent type of chest pain for example, or, or interesting enough shoulder pain, which was, in the, in the bumph from the Government recently about shoulder pain. ER14M.*

The data suggest that the symptoms which are described by the majority of participants correlate with most of the national guidelines for lung cancer which has been developed by National Institute of Clinical Excellence (NICE). The NICE guidelines (2011) states that an urgent referral for a chest x-ray (CXR) should be offered when a patient presents with:

- haemoptysis, or any of the following unexplained or persistent (that is, lasting more than 3 weeks) symptoms or signs:
- cough
- chest/shoulder pain
- dyspnoea
- weight loss
- chest signs
- hoarseness
- finger clubbing
- features suggestive of metastasis from a lung cancer (for example, in brain, bone, liver or skin)
- cervical / supraclavicular lymphadenopathy

(Lung cancer NICE clinical guidelines 121, p. 9)

Within the open ended interview data participants did not mention all NICE guideline symptoms, these included finger clubbing and cervical / supraclavicular lymphadenopathy, however, within the think aloud data both of these symptoms were verbalised. The majority of participants were aware of the key salient features to do with lung cancer recognition and referral, and were often focused on what were described by a number of participants as 'barn door' symptoms.

> *I think with the barn door presentation and if someone has a persistent cough and being for chest x-ray; someone who has coughed up some blood and has been for a chest x-ray.ER01M.*

Participants seemed attuned to red flag features and are actively looking for salient features as part of their clinical decision making. Additionally, within the discussion about red flags, many participants also described how they had experienced challenging or atypical presentations.

> *I think the thing I've found over the years is to expect the unexpected, not to expect things to conform to textbook kind of descriptions or presentations and to have a high index of suspicion but that you kind of, you carry with you throughout your working day really.ER12M.*

> *Well it's likely that it's the, those atypical presentations, those are the ones that are hardest to, try and hit early, and sometimes it's a feeling in your water, sometimes it's a need to have the time to reconsider, you know, what affect that this person's presented for the third time and, you know, you haven't got to the bottom of what's wrong with them.HU22M.*

The atypical presentations are described by many participants within various patient situations and presenting through differing symptomatic guises. A table capturing all the challenging or atypical presentations compared against the salient or red flags that were verbalised by participants are presented in table 6.3.

Table 6.3: A list of challenging and atypical presentations compared with salient features experienced by participants.

Challenging or atypical presentations	Salient or red flag presentations
• Afferent ataxia • Lump in axilla • ADH secretion • Polyarthritis • Paraneoplastic symptoms • Stand-alone fatigue • Stand-alone weight loss • Shoulder pain • Horner’s syndrome • Non-respiratory • Coronary Obstructive Pulmonary Disease (COPD) pattern changes • Generally unwell • Abddominal pain • Hyponatraemia • Sore throat • Hoarse voice • Non smoker • Abscess on upper thigh • Young age • Unexplained neck pain • Unexplained back pain	• Persistent/progressive/chronic cough • Haemoptysis • Weight loss • Loss of appetite • Breathlessness/shortness of breath • Unexplained chest pain • Hoarse voice • Shoulder pain • Chest infection/respiratory symptoms • Smoker • Night sweats • Coronary Obstructive Pulmonary Disease (COPD) + smoker • Cachexia

A number of symptom presentations appear in both columns in Table 6.3. These include COPD, shoulder pain, hoarse voice and weight loss. The data suggest that some participants seem unclear in what they view as challenging or atypical and what is stated in the NICE guidelines. Participants highlighted the challenge of what is considered to be an atypical presentation and identified training needs related to those presentations. These are viewed as unusual and don’t fit within the NICE guidance and create additional complexity for recognising lung cancer and also a grey area for referral pathways, as one participant states:

> *Well if you give me a set of concrete guidelines but then people don't, this is the problem, we've got concrete guidelines for all sorts but you have trouble fitting in patients into the guidelines and deciding, you know, what's right. HU23F.*

Within the context of COPD many participants suggest a level of complexity in identifying the changes in worsening of COPD and the recognition of early signs of lung cancer. The majority had experienced diagnostic challenges with patients who have COPD.

> *I suppose the delays are likely, I think they are more likely to arise in say your COPD patient who is having a bad time and they are having a bad time over a period of months. So at what point do they deviate from the normal pattern of a run of exacerbations and at what point do you start to think this is not just exacerbations, some underlying theme on top, so it's superadded co-morbidity. ER01M.*

> *I suppose the biggest delay diagnosis that we're going to have would probably go to be your COPD people who are getting worse and we're thinking it's progression of COPD when it's in fact a lung cancer. The problem being that early lung cancer and progressive COPD, and exacerbations of COPD can present very, very similarly and if we investigated every exacerbation of COPD as a suspected lung cancer, that would be a hell of a lot of work.ER13M.*

To summarise the data suggest there is a high level of consistency amongst participants in their alertness of red flag or salient features associated with the recognition and referral of suspected lung cancer. The majority of participants viewed atypical presentations as difficult and as one of the biggest challenges in recognising suspected lung cancer. The majority of the participants also focused on respiratory symptoms and other patient factors to help make a clinical hypothesis, but unusual non-respiratory presentations or vague non-standard symptoms which involved complex patient characteristics were viewed as adding to the difficulties in making an appropriate decision.

6.4.3 Analytical versus intuition

Within clinical decision-making the literature highlights theoretical frameworks which support different approaches to clinical decision-making. As discussed in detail in chapter (3) Dual Process theory helps the understanding of decision-making by describing analytical and intuitive paradigms and their individual theoretical underpinnings. The data suggest several participants use either an intuitive or analytical process or sometimes both within a patient consultation to make a clinical decision. Some participants describe the complexity of patient presentations in which guidelines or algorithms don't necessarily fit which creates grey areas, making a reliance on both analytical and intuitive paradigms necessary.

> *Whilst not dismissing the standard analytical aspect to decision making, I think, I think the older I've got the more I've learned to listen to my intuition as well, primarily because more times than not it's right and it's very difficult to quantify why that is. NY27M.*

> *I think you should have both, both working together, I don't think you should dismiss the intuitive, I think the intuitive is always going to be an important part of general practice which is actually an art, but it's, but you need to, intuitively you are actually take, you are analysing, it's just in a different, a different type of way. You're, you, it's, your instinct is looking at, looking at the whole patient demeanour, you're picking up signs of a patient works and you're looking at the way they walk, the way they sit, it, it, you're, you're aware of their occupation, their background, lots of different factors, and you use your intuition to guide your analysis a little bit sometimes. NY29M.*

It would appear the comment by participant NY29M using intuition is considered to be more of an art rather than a science but recognising both are used in parallel and complement each other to achieve an appropriate clinical decision.

Within an analytical paradigm this may take form of history taking, visual cues, presenting symptoms and demographics of the patient in which to formulate a hypothesis.

> *Yes, what's making me clinical reason? So I'm thinking about the history aren't I and the Red Flags? I'm thinking about the examination, and even when the patient arrives I'm thinking about the demographics, so if they're a smoker, if they've had industrial exposure. I'm thinking about the things like do they present, do they not*

> *present?...... So I'm thinking about all different things but a lot is a lot of it I think in General Practice is to do with your experience of that patient and kind of how they present. NY25F.*

However, the data also suggest the majority of participants used intuitive paradigms in helping them with their decision-making especially when patient presentations are vague.

> *Obviously intuition wise, sometimes people have symptoms and they don't correlate at all but you just get this feeling that something isn't right with this person, and so you will decide to take it a bit more seriously.HU20F.*

> *I used my intuition to override, override my head sometimes but usually that's being more cautious rather than less cautious, I would, I would rarely use intuition to be less cautious I think in the face of symptoms because it would be very hard to justify why you haven't done something if you, in the fact of a list of symptoms. HU23F.*

Within the data participants used different metaphors to describe intuitive prompts when involved in a decisional situation. These are listed in Table 6.4.

Table 6.4: List of metaphors by participants describing intuitive prompts.

Metaphors describing intuitive prompts
• having a gut feeling
• sixth sense
• it is an art
• little voice in my head
• on my radar
• my antennae
• rules of thumb
• hairs on the back of your neck
• feeling in your water

> *An important step to consultation and sometimes you've got this gut feeling somewhere that this is, there something else really nasty going on here? They can have a certain appearance, but that is, and I expect not of his clinical side, nothing systemic, they may, where you think something has changed here and it's usually, an important general factor.HU06M.*

> *It's one of the it's one of the strengths and the weaknesses of, you know, I said pattern recognition but it's also, it's, if you rely on pattern recognition, you also miss presentations a lot don't you? So it's not good enough, I mean we, we probably should be using algorithms for a lot of things, you know, you, I know that I'm familiar with algorithms for, it's called Bayesian thinking.NY33M.*

The above statement by NY33M highlights the recognition of missing a diagnosis due to the over-reliance on intuitive paradigms involving pattern recognition or gestalt effect. According to Klein (1999), experienced decision-makers recognise overall patterns (gestalt effects) in the information presented and act accordingly inferring action is recognition primed. What this implies is suggested by Cook (2009, p. 6), namely "that clinicians have the ability to indirectly make clinical decisions in absence of complete information and can generate solutions that are characterised by generalisations that allow transfer from one problem to the next".

Additionally, the data suggest there is some polarity between participants and their use of intuitive and analytical paradigms. Whilst participants highlight the importance intuition plays in clinical-decision making and how this is gained over many years' experience, one opinion (NL34F) implies that being too confident clinically may lead to missing something relevant or important.

> *If somebody has got quite a lot of experience and is not using, sometimes to just, you know, just like driving, if somebody is very confident in driving, you tend to miss things as well but then you tend to take on-board the things which other people would not take on-board as well.NL34F.*

> *I think being a relatively experienced GP, I think it does make a difference actually, I think whatever your knowledge levels are, I think the more patients you've seen and the more experience you've had over the years, I think that's invaluable really,*

> *I, I know that over the years I've kind of, valued my own experience, you know, particularly and I guess there's no alternative, there's no, other way of gaining that other than spending lots of years in general practice.ER12M.*

In contrast the analytical paradigm involves deductive reasoning and Bayesian reasoning which is viewed as a conscious, rational, logical, contextual and a much slower process for hypothesis generation.

One participant describes experience as a two-edged sword and learning from cases they have seen versus the more experienced GP not keeping up to date:

> *I think, experience. Experience is a two-edged sword and that the more cases you've come across if you learnt from those that it's likely to be to your benefit. The one thing that may handicap older GPs is whether they are up to date.HU22M.*

Some participants relate to experience and how it influences their decision-making due to repetition and exposure to atypical presentations.

> *I think experience can work in two ways, I think you can, I think most experience is really helpful because you've seen things present in atypical patterns and you're alerted to those, so when things just don't quite feel right or you have seen it like this before, you will always, you know, you won't miss it twice.ER15F.*

> *Other opinions suggest less experienced individuals may be more cautious practitioners and have an over-reliance on analytical paradigms within clinical decision-making.*

> *I still think that experience helps and I would although as a, as a GP I think when you, initially starting out as a GP you probably would, can have a tendency to over investigate sometimes.HU24F.*

> *I think younger, younger doctors, less experienced doctors who have not seen so many things are more likely to follow the hypothetical deduction pathways. NY28M.*

Finally, some participants raised the issue of pattern recognition which raises the debate on participants understanding of the differences between pattern recognition and intuition.

> *I mean there's undoubtedly pattern recognition is, is helpful, and, you know, you should never ignore the little voice behind your back which says are you sure? or, you know, it's, it's, it looks like this, but, you should always revisit I think, and, and not, not, not assume that, you know, you're always, always right.NY28M.*

> *Yeah, I think so, that perhaps you've seen somebody with, seen somebody with, no it's not intuition, it's if you've seen somebody with something before and they were very like this, you look at somebody and think gosh they've got lung cancer, (...) so that's more the pattern recognition I think.NY25F.*

The statements from NY28M and NY25F highlight what is understood about intuition and pattern recognition by participants. Participant NY28M describes the helpful nature of pattern recognition however, contextualises this particular phenomena by using a metaphor of "never ignore the little voice behind your back" which may be best described as an intuitive prompt, whilst a contrasting perspective by participant NY25F highlights the repetition of seeing something before which is clearly defined as not intuition but is viewed as pattern recognition. Both viewpoints demonstrate the variation in participants' understanding of pattern recognition and intuition, as one participant concludes intuition is a combination of experience and the repetition of clinical scenarios.

> *I think intuition isn't quite the pseudo thing people think it is, I think it's actually, a combination of having seen lots and lots and lots of cases and you've seen lots of scenarios and, and it's all accumulated in, in your subconscious mind, as well as your conscious mind and, and you, you're actively drawing on this. NY29M.*

The inferences that can be made from the statement by participant NY29M suggest that intuition may be an accumulation of experience gained over many years which draw on the GPs diagnostic memory. The cause of this may be due to the uniqueness of a GPs role and their exposure to lots of different cases and patient presentations.

6.4.4 Summary

In summary the findings suggest participants have a good understanding of analytical and deductive paradigms involving red flag symptoms, history taking, and physical examination. There seems however, some variation amongst participants in the understanding of what constitutes intuition and what is viewed as pattern recognition and the potential differences between both. Some participants describe intuition as something that is gained with years of experience and that it is formed from pattern recognition. This may be due to repetition of consultations and a build-up of cases scenarios from clinical presentations which can be then pulled out from their diagnostic memory. One theory is the inter-relationship between years of experience and participants increased adoption and reliance of intuitive paradigms in clinical decision making. Furthermore, a reasonable inference to be drawn from the findings is that intuition is really pattern recognition based on years of experience. Confirmation of this theory may be considered as the unprompted participants were able to reflect or recount stories of patient experiences and the differing patient presentations and what they learned from those encounters which fundamentally influenced their clinical suspicion of lung cancer.

How this relates to the recognition and referral of suspected lung cancer is important as there may be an increased risk of missing a diagnosis because of the natural default to adopting intuitive behaviours. This may be due to experience clouding a more deductive approach when confronted with a vague non-standard set of symptoms.

6.5 Practice structure and culture

Underpinning this section are a number of facets which include the role of education and training, social structures, quality improvement, internal processes and individual differences between GPs. The different facets within the practice structure and culture help maintain standards and keep GPs up-to-date. It is suggested within the data that these different facets create the fabric of the organisation and may be a factor in increased quality patient care.

6.5.1 The educational and training agenda

The sub-theme presented in this section captures participants' views on the perceived variation in different organisational structures in a general practice and how this variation may impact on the recognition and referral of suspected lung cancer. A sub-theme that emerged from the data was the differences in educational practices and the subsequent communication structures supporting them. The sub-theme relates to factors associated with practices that have either teaching or training status, both of these or neither of these. It was viewed by one participant that teaching or training status is a characteristic associated with higher quality patient care.

> *I think education practices do tend to deliver a slightly higher quality standard of care, because, they, they constant, there's a constant process of education going on.NY29M.*

One could argue the benefits of educational practices do not directly relate to patient quality outcomes, as quality is complex and multidimensional and no single group of indicators is likely to capture all perspectives on, or all dimensions of, quality in general practice (Kings Fund, 2011).

Inferences that can be drawn from the data suggest there may be cultural differences between practices that are educational and those that are not. Many participants highlight learning and sharing opportunities within an educational practice in which a structured time for clinical updates or interesting case studies are shared and discussed amongst medical students, trainee GPs and practicing GPs. This is not to say that non-educational practices don't allow time for discussion and communication but the data suggest educational practices have a mandatory process and structure in place. This raises an important point for the discussion chapter and the implication of this research and the exploration of strategies that may replicate organisational characteristics of educational practices and be applied across all general practice.

> *It happens on a more kind of structured basis with, registrar doctors and medical students that we have with us. I find I have medical students one day a week and we have longer appointments and, I quite enjoy the time for reflection, that that allows, and then we, we've tried to have a more structured kind of, venue for discussing difficult clinical cases by having, a clinical, a clinical portion attached to our practice meetings, so that there's usually just one case a week but one doctor will bring one particularly difficult and challenging case to that and then, there's a discussion amongst all GPs at the practice about that case.ER12M.*

> *You see we are a training practice and we have got some trainees and we talk about the two week rules and they all seem pretty hot on when they would request a chest x-ray and when they would refer, so the training is a little more consistent so the educational bit and the knowledge bit, and the threshold for thinking about it is getting lower and more consistent.HU02M.*

> *Yeah, you're more likely to talk about NICE guidance, you're more likely to, you're more likely to be up to date on, and that's more likely to be a weekly event in an educational practice.NY29M.*

The data implies that communication structures are central components within educational practices. The structures seem embedded within the fabric of the practice organisation and are a mandatory requisite in delivering education to medical students and trainee GPs.

However, in contrast one participant stressed that whilst having a teaching ethos because of being a teaching practice there are differences in learning opportunities between practice colleagues.

> *I think there is, there is an ethos of the teaching because again we're a teaching practice and we have medical students and we have Foundation Two Year doctors here, as well so they are very keen on teaching. I think the general teaching and education between us as the doctors doesn't happen as much, certainly as much as I would like it to happen. It's more sort of ad hoc than, than on a regular sort of fixed basis or something like that, so occasional teaching happens for us or discussions around things, every now and again but there's no fixed time for it or something like that, if that makes sense.NY31F.*

The statement by NY31F highlights the lack of peer-to-peer education between colleagues even though the participants are actively engaged in teaching medical students or trainee GPs within a teaching practice. This is further supported by participant NL35M who works in a non-educational practice.

> *I mean we have weekly meetings, practice meetings, but they're quite, they're quite kind of business like, and I don't think anyone really gets enough time here*

> *to, to kind of have an informal chat about patients who they've seen, …………… we've got email communication and internal messages which probably is more communication done through that then there would be face to face, which, can be quite hard to work like that sometimes, because I don't know, you sometimes want to see, other people around and just kind of, get ideas from them, I don't think we've got that culture very, very well unfortunately.NL35M.*

Additionally, a divergent opinion offered from another participant challenges the potentially enhanced characteristics of educational practices and the differences in diagnosis rates of lung cancer and suggests that these educational characteristics wouldn't make a great difference.

> *If you live in an area like this you will see a lot of elderly people, so it increased and that tells some characteristics about what type of population you are dealing with, [.......] but apart from that you know whether it's rural or urban, whether they are training practice or not or teaching practice or not or research practice or not I don't think necessarily if you took ten practices with different characteristics all have the same prevalence of lung cancer in the area I don't think you are going to find great difference between the number of pick up rates of lung cancer by practice I don't think it will be significant.HU02M.*

A reasonable inference that could be drawn from the data is that educational practices have a consistency within their organisational structure that is a facilitator for the dissemination of knowledge and information amongst practice colleagues. These structures enable GP exposure to the most up-to-date evidence that may be a factor in decision-making for the recognition and referral of suspected lung cancer and increase further understanding of atypical presentations and differing clinical cases. Participants describe a range of mechanisms that are in place for sharing and learning between medical students, trainees GPs and practice GPs. The data identifies GPs from educational and non-educational practices speaking about the differences of their organisational structures. These structures may be viewed as an enabler for GPs in the recognition and referral of suspected lung cancer.

6.5.2 Communication and social structure

The data suggest there is some variation in participants' communication which is worthy of exploration. These involve formal and informal interactions which may be an important factor in participants' clinical decision making. The data suggest a range of social communications and interactions that occur amongst participants either through formal structured meetings or via informal gatherings or situations. These processes form part of the cultural fabric of an organisation. It also demonstrates how different participants can receive and communicate information. The data suggest the processes may be a factor in creating a cultural setting for general practice which contributes to the dissemination of knowledge and learning about patients and the symptoms and guidelines within a safe and transparent environment. These were described as an ethos of the practice that was often underpinned by participants and practice partners' values and beliefs. The focus begins with the informal strategies and these often consist of discussions that can occur in communal workroom settings or over a morning coffee, lunch time or at a time when colleagues and peers informally come together.

> *I mean at this practice we have a doctor's workroom which means that we, we tend to do a lot of our paperwork in a communal kind of setting and discussions, most of which happen there is mostly around, probably around patients that we've seen or interesting or unusual or challenging cases, so it kind of happens every day at an informal level.ER12M.*

> *We're a bunch of mates and, (.)they're kind of my best friends, we don't socialise, well we do socialise actually, but not in each other's pockets but they're good friends of mine and we like each other and we talk to each other, we, so we will meet, meetings are planned to, to happen, we have some nodal points in our day when we meet, so we meet for coffee in a morning, we'll meet for tea in the afternoon and you're expected to go, and even if you're running behind you try and just put your head round the door to say hello and then we'll meet at the end of the day usually before we leave, so we'll, we'll actually have numerous contacts during the day and that's quite unusual actually, a lot of practice, a lot of practices get on by not meeting each other, we get on by meeting.NY33M.*

> *Reflecting upon it in a non-threatening way is, is part of, you know, it's just interesting, you know, talk to a colleague, how would you have done this? I've done this, what do you think of these results? NL26M.*

In contrast some participants describe a formal mechanism to knowledge transfer and dissemination of new learning amongst peers and colleagues. The data suggest formal mechanisms occur within practice meetings.

> *For us we do have a regular educational meeting and we do interact with each other in terms of, patient presentations and if we see any, any atypical cases we go and discuss, we do, and we have a level of the scenarios and things like that, so we work like a team and we all have the same way of thinking.HU17M.*

> *We have weekly meetings, all doctors, nurse practice and the managers sit together and discuss not only how the practice is running but anything interesting happening or anything we should develop further HU08M.*

> *We have a cancer gold standards meeting once a month where we discuss any new diagnosis of cancer and we follow up terminally ill patients or recent deaths and discuss all of that, and I think it depends on what, what you learn from those, those experiences.HU23F.*

The statements by HU17M, HU08M, and HU23F all imply formal educational meetings have an important role to play in the recognition and referral of suspected lung cancer. The inferences from the data suggest that the sharing of interesting patient presentations and atypical presentations or new cancer diagnosis are important interactions that increase individuals' knowledge and awareness of cancer symptoms. These organisational interactions create an improvement platform which becomes the cultural fabric of an organisation which may improve patient care.

Some participants describe how differences in communication styles within general practice can influence the culture of the practice and thus influence the formal and informal knowledge transfer of information and learning.

> *I can only say that it's, in the practice that I am now that we, we encourage that kind of culture, because where I was before, even though it was a big practice in Leeds, ten or so GPs, it was quite dysfunctional really, you just kind of got your head down and did what you had to do, but there was not much communication between the GPs, apart from the practice meetings, where they were mainly business*

> *orientated, but where I am now I mean we had sort of, we meet for coffee every day so if there's ever anything new that crops up we'll say, you know, Mr So and So came last week, you know, and when we get a new diagnosis, cancer diagnosis from the hospital, everybody knows about it because we circulate it through for, for every, for everybody, so that they're aware and where it's a new diagnosis the person that referred that particular person.ER05F.*

An additional opinion describes their practice meeting being business orientated and recognises the disadvantages of this.

> *I mean we have weekly meetings, practice meetings, but they're quite, they're quite kind of business like, and I don't think anyone really gets enough time here to, to kind of have an informal chat about patients who they've seen, I mean, you might get the kind of chance over coffee, just randomly but there isn't, because it, everyone's kind of coming and going all the time and this is like a single building, you, you kind of might meet them passing in the corridor or you might see them in the reception room for five minutes and have a brief chat at, and you, we've got email communication and internal messages which probably is more communication done through that then there would be face to face, which can be quite hard to work like that sometimes because I don't know, you sometimes want to see, other people around and just kind of, get ideas from them, I don't think we've got that culture very, very well unfortunately.NL35M.*

The data also highlights individuals' values and beliefs that contribute to the cultural fabric of an organisation which often involves descriptions of an ethos or philosophy for the practice.

> *I think an ethos of a practice and a practice that, that talks to each other, in particular in terms of the nurses and the doctors, disseminating, for example, when there's been a, an unusual diagnosis for example, so that that's shared within the team so that people become aware and they think oh, I'll make sure that I remember to do that if that happens to me, or learning from significant events or a missed or delayed diagnosis of cancer.HU24F.*

> *When you take on a partner making sure they've got the same philosophy you have, so that the practice over time regenerates with the same main characteristics, that*

> *it doesn't drift and so we've had a reasonable turnover of partners I suppose over time, and, keeping that enthusiasm alive, you know, how does one do that? I mean it's the main reason I do this, this job is for the, the joy, I was going to say the joy of diagnosis, I mean there is a joy of diagnosis in getting it right first time, and effectively, managing your patients.ER14M.*

> *We've got a printed philosophy, I mean I think we, we are a practice that's always been very driven by servicing patients, so we value, offering high quality of care above most other things really. We are a practice that's very keen on, you know, be, being a team, and I think again in a rural area, you, it's, I don't know, at any rate we seem to have good relationships with lots of other agencies, district nurses, specialist nurses, so on and so forth. [...] yeah, so I mean this is quite a stable population, so I think that GPs, we've actually just taken on a new partner but the rest of us have all been here for many, many years, so we kind of, it is a, our ethos if you like a bit kind of like an old-fashioned family doctor thing, you know. NY32F.*

Some participants are more aware of the differences of culture compared to others. This becomes more apparent when practices merge for business reasons and partners and staff can observe the differences of internal processes and cultural variation.

> *So we've got a culture of meetings and they haven't got a culture of meeting, they don't meet for coffee, which I'm horrified about and we've tried to change their timetable, they've influenced our plan but we've tried to influence theirs to get more of a shared, you know, you really should meet your mates for coffee if you're in, if you're in a surgery you should meet for coffee. NY33M.*

To summarise, the data suggest there are a number of different channels which participants use to communicate with each other, share learning and disseminate information or knowledge. The channels are implemented using informal or formal processes within the general practice environment. The informal strategies are implemented in communal work spaces, over morning coffee or lunch usually within a more relaxed and informal setting. The formal strategies are often anchored around business practice meetings which some participants viewed as disadvantageous, as time and business-focused agenda items may outweigh medical discussion between clinical peers about patients, recent literature and guidance.

6.5.3 The quality improvement agenda

A sub-theme that emerged from the data explored quality improvement which involved clinical audits and Significant Event Audit (SEA).

Whilst clinical outcomes are the ultimate measure of quality, relevant organisational structures and processes need to be in place to facilitate this. The student believes the creation of a quality improvement environment involving the cultural and organisational characteristics of teaching and training practices that are highlighted in this data can facilitate the process for quality which may ultimately impact on patient care.

A viewpoint from one participant describes an audit on referrals which are then discussed at a meeting in order to learn from the findings.

> *We have started to look at our referrals as well, we've decided to look, because we are high referrers and say what are we going to do about this? Right, well we'll discuss our referrals every so often, I don't know, we haven't done it recently but we have looked at our last, you know, our own last ten referrals and then brought it to the doctor's meeting together with the five of us and gone right, would you have done this differently? You know, this is the patient I saw, this is the symptoms they had, this is what investigations I did and then I decided to refer, what would you have done? And so hopefully we'll try and learn from each other a bit, if there are other pathways we could have used or other treatments that we could have done.HU20F.*

> *Everything we do now, everything we do is getting looked at in terms of how much resource we're using, so there is an impact, there is potential to impact on diagnoses that adversely affects referrals, you probably know that there's referral management going on at practice level, so in our practice we take a couple of disease areas, a couple of specialties and any referral going into that specialty has to be scrutinised by another person in the practice, so there's, so effectively there's a meeting which gives a second opinion on it.NY21M.*

From the account by NY21M and the recognition of the impact referral audits can have on the referral for lung cancer, one can infer that whilst clinical audits are often viewed as a mechanism for improving quality internally, the focus is on the reduction of cost and cost efficiencies in primary care and not improvements in quality. This may also be viewed as adding additional pressure to participants' referral practices thus having the opposite effect and potentially delaying the diagnosis of lung cancer. However, it may be argued that audits generated by GPs themselves are viewed as quality improvements whilst externally driven audits may be more concerned with resources.

Other formal knowledge transfer strategies are prompted by significant event audits (SEA). According to the National Patient Safety Agency an SEA is:

> A qualitative method of clinical audit. In this respect it differs from the traditional process of audit which most primary care teams will be familiar with: for example, when reviewing and improving care in the management of diabetes, asthma, IHD, or hypertension. These audits tend to deal with larger-scale 'quantifiable' patient data sets and involve defining criteria and setting standards which can be measured and compared against. However, SEA should involve a systematic attempt to investigate, review and learn from a single event that is deemed to be 'significant' by the healthcare team.
>
> (Significant Event Audit Guidance for Primary Care Teams, 2013, p. 8)

Pringle's SEA definition: "A process in which individual episodes (when there has been a significant occurrence either beneficial or deleterious) are analysed in a systematic and detailed way to ascertain what can be learnt about the overall quality of care, and to indicate any changes that might lead to future improvements" (Pringle, M., Bradley, C.P., et al., 1995).

> *So I mean formally there'll be a significant event analysis which can be well or not so well facilitated and that can be hard for people. So I've sat in them where somebody had a delayed diagnosis and comments were made about a nurse who saw the patient but done in a negative way.NY25F.*

> *We also have critical incident meetings, and we have those about every six weeks and there's a culture of people generally saying, what, what they've done wrong, they're mainly what we've done wrong, occasionally what we've done right but*

> *you learn better from what you did wrong. What you did well makes you feel good about yourself but you don't really learn the lessons but you do learn lessons from what you did wrong. NY33M.*

These previous comments raise some important viewpoints and experiences by participants. One can assume whilst SEAs (sometimes referred to as 'critical incidents' by the participants) are seen as a part of maintaining patient safety it is clear there is variation on how SEAs can be viewed. These accounts give some insight into participant perspectives surrounding this process, given that the focus of SEAs is to illuminate all aspects of 'significant' events.

To summarise quality and improvement were described by participants often within the context of clinical audits or significant events audits (SEA). Participants view SEAs as a form of internal quality improvement. These were strategies often discussed in business practice meetings but were often viewed within a negative or challenging context. The rationale for this view was in the way these discussions were sometimes facilitated poorly and the approach ended up being viewed as a performance measure rather than seen as a learning and development opportunity. The inferences from the data suggests improvements and new developments amongst participants were viewed through formal strategies in which to create a platform for improving quality across the practice which can be viewed as a facilitator that can influence upstream and impact on the recognition and referral of suspected lung cancer.

6.5.4 Internal organisational processes

For the purposes of this thesis 'internal processes' are defined as the internal business and domestic functions relating to the delivery and running of a general practice within primary care. A number of participants highlighted the importance of their organisation's internal processes which can involve secretarial systems, access to diagnostic results and referral processes can reduce delays in the system. The inferences from the statements suggest participants seem alert to the implications for patients if delays are created within their practice. The internal organisational processes are viewed as important mechanisms that contribute to the flow of patient activity.

> *....the culture of the practice, yes definitely, it does affect, when the chest x-ray report comes, I think if there is anything suspicious and they fax it that we should have a very good reception system, reception, but being, so that they can just bring*

> *it to the note of the GP and then so that it can be seen the same thing to decide whether they need an urgent management or not, so it's very vital that it's there, checking of, everybody needs to have an eye.HU11F.*

> *Testing wise, blood tests etcetera, we can do everything that we, that we need to here in the surgery and get them all done the same day, so that's not, not a huge delay or, or issue.ER13M.*

These processes are discussed in the literature and in detail in chapter two (2). The findings suggest the importance of the whole system and the impact of appraisal, referral and appointments, which are contextualised within the diagnostic interval (Walter et al., 2012), and scheduling delay (Andersen et al., 1995), and are considered to contribute delays in diagnosis and cancer outcomes. The importance of efficient and effective internal systems is mentioned by participants and is perceived by one participant to contribute to a high quality general practice.

> *I think most general practice is much more organised than secondary care, so most of the practices that I worked, I would say the internal investigations are dealt with very well by the reception team, the moment they get the fax, they get it to the oncology people, they get it sorted out, so it's very, very rarely they don't do that and again the same thing goes with secondary care, if there's something, we, very urgent, we fax it, some of them are quite good, they do send it to the MDT. HU11F.*

> *I think it's extremely well run for a lot of things, a very good Practice Manager who keeps a really strong arm on the staff, but really good secretarial system and reception, so if I do a request for x-rays it gets done, they will sort it out, if they're responsible and they work really well together, I think it helps when everyone knows everyone, you get on very well. So if I call my secretary say could you please trace this lady's x-rays, I'm a bit worried, haven't got it, I put it down, she went for an x-ray, how come it's not here?. ER16F.*

> *If you don't have a, a protocol of, doing things in a certain way, it's not just for your protection, you don't want to miss things anyway, so the, it's a, it's a double, a double benefit if you like, you want to, you know, as I said I, most GPs would want*

> *to think that if somebody threw a cancer at them, then they won't miss it, and, (.) that, that doesn't just apply to the doctor, it applies to the team, the nurses have picked up cancers, one of the locums have picked up cancers, it's a team thing, my, you know, stuff comes in through the letterbox and the reception staff think she's got cancer, so the cancer is first, it, it becomes whole, issue for everyone in the practice really.HU19M.*

The above statement by HU19M highlights a heightened alertness and not wanting to miss a cancer on a practice level rather than from an individual GP perspective. The participant describes the value of internal processes and the whole practice team being alert to cancer information which may influence the recognition and referral of suspected lung cancer.

> *I mean it's, it's what kind of stall you set out in your practice, (.) for instance, you know, well every practice has, well let's get it right, many practices built on their specialisms but the doctor has a certain specialty that tends to attract a certain type of, patients, if somebody's interested in geriatrics then you probably get a bigger, you know, the nursing homes type clients etcetera. There's certain disease and certain types of illnesses, if you haven't got a good stall set at all, it will destroy your practice. If you look after drug addicts, which I do, if you haven't got a good tight ship about register, all from knowing who's who, you know, your, your procedures, your protocols. Who does what, how do they collect this, that, they could run rings round you and you would not survive two days so you need to have a solid stall with them, in the same way for certain things that are, you know, that are potentially, how can I put it? Potentially problematic to the practice in, in, in, in terms of complaints and other things, you need to have your stall set out very, very tightly and very well, so you know, so if, if the results comes in, have you got someone looking at it? Who's the first person looking at it? Has it been scanned? What's been done about it, if anything? HU19M.*

The above statement by HU19M describes the inter-relationship between having robust, efficient systems which the participant describes as a 'tight ship' or 'your stall set out very tightly' and the application of a mechanism for counteracting potential complaints, robust safety netting or dealing with certain challenging patients such as drug users. A recent study by Mitchell, Rubin et al., (2013) involving a qualitative synthesis of significant event audit accounts related to lung cancer highlights the importance of GPs using appropriate safety netting and the agreement of follow up plans with patients.

To summarise, the majority of participants recognise the importance of having efficient and effective internal organisational systems and processes. Effective internal systems act as a 'safety net', ensuring that results are reviewed in a quick and efficient manner and enable a patient's referral to appropriate pathways or treatment. Participants describe their secretaries being a key component within the practice and as having an important role in keeping the practice systems running efficiently and smoothly, for example knowing how to obtain results and information quickly. A robust internal system is recognised as having a whole practice approach from receptionists, secretaries through to practice nurses that contribute to a GP obtaining results quickly. The data suggest that having good internal systems and processes may be an influential factor in the recognition and referral of suspected lung cancer.

6.5.5 Individual Differences

For this thesis individual differences are described within the context of psychology considering the variations or similarities among people including aspects such as intelligence, personality and aptitude. There is a multitude of individual differences that involve the work setting and the role they play within the work environments. For the purposes of this thesis the focus will be on personality traits. Personality traits are defined as:

> Enduring dispositions and tendencies of individuals to behave in certain ways. Personality is not a single thing. Instead, personality refers to a spectrum of individual attributes that consistently distinguish people from one another in terms of their basic tendencies to think feel and act in certain ways. The enduring nature and consistency of personality characteristics are manifested in predictable tendencies of individuals to behave in similar ways across situations and settings.
>
> (Ones, Viswesvaran & Dilchert, 2005b, p. 390)

The analysis proceeds to explore the role of personality amongst participants and its potential relationship with the recognition and referral of suspected lung cancer.

Several participants recognise the differences in personality between clinical colleagues and some describe how personality, within the context of being a conscientious or cautious practitioner, for example, may be aligned to the individual's clinical performance involving referral rates. Some participants align personality to certain traits for example; being nosy, a good or bad listener and communication style and how that impacts on their practice organisation as well as within the context of a patient consultation. Participants recognise that personality is important and they are aware of its affects amongst themselves. The data suggest that there is a relationship between the participant as an individual and how they might influence the practice organisation and also within patient consultations.

> *I think being a big practice and lots of different personalities and doctors I'd have thought that for most people they'll be somebody that they can connect with, and so those people who feel chastised by one may feel supported by another, so hopefully that aids it. ER15F.*

Many participants describe personality through the lens of performance and decision-making and specifically within the context of being viewed as high referrer or a cautious practitioner.

> *I think there are different personalities, I think, I know myself and two of my colleagues do more two week referrals than anybody else and that's part of, and that isn't that we're better doctors or worse doctors, that's just part of, I think some people practice more cautiously than others.ER15F.*

> *Yes, I think that it goes with the personality type, so the person who is a completer finisher, conscientious, doesn't like living with uncertainty, is perhaps more like, more cautious, than those who are more prepared to temporise for longer.NY25F.*

> *I do actually do more investigations, do find more things but whether you find more relevant things is debatable, and I think personality inevitably plays a part but it would be hard, however strict your protocol, it would be very hard to remove personality from consultation and in a way that's one of the things that actually makes General Practice consultation, I was going to say successful but, enduring, in that this, this form of practice and medicine has continued because some of it is definitely personality based. HU23F.*

In contrast to the above argument suggesting personality is an important factor another participant thinks personality doesn't have an impact on decision making, professionalism or within the context of a patient consultation.

> *I don't think my personality comes into my decision making, if I'm seeing the patient then my cultural background, my religious background, my own type of personality, I usually don't let my personality come in my professional, in my prof, in my, with my patients, or when I'm dealing with the, with my, with other people, and so as far as I am concerned I do not think that my personality hinders me doing, I mean anything in my consultation.NL34F.*

The comment made by participant HU23F is in relation to the patient consultation and the inter-relation between the personality of a GP and the patient consultation. The comment is suggestive of the importance an individual's personality can have within general practice.

> *Patients shop for doctors who they think they get a good service from and part of that service is personality but part of that service is how they're managed and how they're treated, so just like you shop around for the cheapest petrol, patients shop around for a doctor who serves them best, and within a practice and between practices. NY27M.*

Conversely, the data suggest that part of personality is also related to communication skills. These differences in communication skills may also have a potential impact on a patient consultation or patient outcomes.

> *I mean that doctor doesn't listen to me, doesn't even look at my face or my eyes, so I assume that, you know, the personality counts, but how they see we are counts as well. You, probably you're not the best listener every time with the patient every day.HU18M.*

> *There are things about GPs personalities [...] GPs are basically okay about making clinical diagnosis, most of the time but the big, the differentiator might be their communication skills, so sometimes you might have a doctor who are not good listeners and, and sometimes they can miss things through not listening I think.NY21M.*

> *...doctors have different personalities and that's why different patients enjoy seeing different types of doctors because, you know, that one tells it like, like it is and, you know, gets, you know, or this one's a bit gentler and, and, you know, just, you get a bit of a chat with this doctor. So it, patients are also aware of the different personalities within the practice and they will definitely have an impact on your consultation with your patients.ER05F.*

6.5.6 Summary

In summary personality is recognised and highlighted in a number of ways within general practice. Participants describe the differences of personality through clinical performance and often within the context of referrals or been a cautious practitioner. Additionally some view being labelled a high referrer as being a conscientious general practitioner and having little relevance to being cautious or an unconfident doctor. Some participants suggest personality has some influence on diagnosis and patient care and these are verbalised via descriptions in differing communication styles and often in a negative light due to poor listening skills which may lead to missing important things and creating further delay. Participants also describe personality as; being 'nosy' or having a genuine interest in people or being a completer finisher; whilst others describe personality as being a good listener and good communicator within the patient consultation.

6.6 The pressure on general practitioners

The third theme to emerge from the data analysis related to pressure on GPs. A range of sub-themes emerged from the analysis exploring participant's views on missing a lung cancer diagnosis, complaints and litigation and system referrals.

6.6.1 Missing a diagnosis

It may be deemed useful that within this thesis we define both a missed diagnosis and a delayed diagnosis to help illuminate the findings obtained from the thirty six participants. The participants describe their experiences of missing a diagnosis and the significance of establishing the correct diagnosis at first consultation, they also describe patients who present late and view these as patients delaying. It may be viewed that a delayed diagnosis is partially the responsibility of the patient whereas a missed diagnosis is the responsibility of the general practitioner. According to the NPSA (2010) delayed diagnosis in cancer is when someone who has cancer:

- is not investigated or referred for investigation; or
- having been investigated, is not diagnosed at the time of the investigation; or
- is diagnosed incorrectly; or
- where a positive test result or diagnosis is not communicated effectively to a clinician with the ability to act on the information; or
- Where a positive test result or diagnosis is not acted upon and treatment commenced as appropriate.

(National Patient Safety Agency, Delayed diagnosis of cancer: Thematic review, 2010, p. 7)

Many participants' experiences of missing a diagnosis of lung cancer were described within an emotive context, often being viewed with a sense of failure and as anchored within characteristics of anguish and regret. There was also a sense of diminished pride with regards a participant's clinical performance if an individual missed a diagnosis.

> *Most doctors if they've made a mistake, or at least, if I make a mistake I beat myself up right, left and centre. [laughs] You know, thinking oh God, and then we go through, once you get over the shock you go through, you know, you talk to your staff and say how, why did we miss it?HU19M.*

> *I mean I know at the end of the day patients need to take responsibility for their illnesses but your professional pride makes you want to think that if somebody threw a cancer at you, you won't miss it and that's, that's how it works, you know, that's how it works for me.HU19M.*

> *I think that there is, in, initially, obviously there is a lot of soul searching and sometimes, you know regrets and thinking what should I have done differently? Should I have done anything differently, could I have? What if I'd done a chest x-ray at that time? What, why did I wait? What were the factors and looking back with, with hindsight which is marvellous to look back at things? So that's, and looking back, sometimes there can be tiny things that you can see which you, you know, that if you did the same again with every patient if you then did a chest x-ray at one point, for that person yes, you would have picked up the cancer earlier. HU24F.*

Within the literature the evidence points to the majority of diagnostic failures as being attributable to a failure in a doctor's thought processes (Graber, 2005). In medicine, as in many other spheres of decision making, there is an 'irreducible uncertainty' that will inevitably result in failure (Hammond, 2000), and of all the failures in medicine, those associated with diagnosis are probably the most consequential (Croskerry, 2009ab) and liable to have negative consequences.

> *I can, you know, remember cases where, you know, patients have presented with shoulder pain and it's not been picked up by us and it's not been picked up the specialist we referred them to until eventually their lung cancer has shown itself and we've all missed it. Yeah, doesn't make you very happy.HU22M.*

> *August was the first time the blood test showed abnormal results and the alarm bells started ringing, admitted him for the sepsis of unknown cause, his diagnoses was established October, so one, I would say one and a half months' delay, which could have been easily avoided, I think it was just missed diagnoses and both the primary and the secondary care, in between he had gone into hospital four times. HU11F.*

The majority of participant experiences of missing a lung cancer diagnosis or delaying a referral are contextualised within challenging or atypical presentations. This has been previously discussed in section 6.4.2. The majority of participants highlight challenging or atypical presentations some of which may be unrelated to respiratory disease and others having very mild and ambiguous symptoms.

> *This was a diagnosis in essence I missed, because I referred them to a rheumatologist for an acute inflammatory poly-arthritis and of course the underlying cause of that was lung cancer. That was 20 years ago, and it's not something I have seen since as a presentation, but I'm ready for it next time.ER01M.*

> *The most memorable is the failure, although it wasn't the last one, it's years ago but it definitely changed my practice, had a farming guy in his late fifties who presented with, wheeze, and, he got reversibility on the spirometry and to all intents and purposes he looked back at straightforward late onset asthma, so I treated him accordingly and he got better. But he then had a bit of a cough and*

> *the cough wasn't the predominant symptom and somebody saw him again with an antibiotic and somebody saw him and said oh it'll take another week or so, and, then, you know, four months later he was, not coughing, not still coughing and someone x-rayed him and he'd got a malignancy and it stuck with me that I did the spirometry and ticked all the QOF boxes for confirming, he'd got reversibility and he wasn't a smoker, and he wasn't, you know, he wasn't the highest risk and I, (.) I do chest x-rays now, pretty much as a blanket investigation because he's the one guy that sticks in my mind that I missed.NL26M.*

> *A memorable one I missed, the patient had COPD and becoming progressively more unwell with it, in that they were increasing breathlessness and more frequent chest infections, so the, they didn't have a chest x-ray and sort of became quite ill I think at some late stage, you know, when the diagnosis was made, and so that, that's a challenge.ER14M.*

The accounts from NL26M and ER14M describe participants' diagnostic memory and their experiences. The above statements suggest there may be modification of behaviour amongst some participants and it is intimated by one participant that this may become a permanent modification.

> *Well that dramatically changes your behaviour if you miss something that, and you're far more likely over the next, you know, two or three years to, you know, up your game in that particular field, you know, people learn from experience, the problem, going back to what we said earlier was you're talking about such small numbers that, you know, it might be whenever you get the next case.HU22M.*

It appears that a form of self-reflection and a reaction involving increased personal awareness through a process of gathering information or knowledge occurs. This is to alleviate any potential replication of missing a similar diagnosis. However, as one participant viewpoint highlights

> *I think that doctors don't get out of bed each day, you know, particularly wishing to miss a diagnosis of cancer, but the fact of the matter is that, you know, in a general practice that's working really hard and really fast and they will miss it because of that reason.HU22M.*

In contrast, one participant viewpoint has a more pragmatic approach with modifying their behaviour in which they become more cautious but then over time resort to normal clinical decisions and moves on from the diagnostic error.

> *I think I'm better at living with uncertainty, I'm definitely on the cautious end and I'm on the conscientious end, I don't know whether I'm more, am I more cautious? I'm, perhaps I'm more cautious with, not with lung cancer but with things where I've seen something go wrong but it's a bit like riding a bike isn't it? I'll be more cautious for a bit for something when I've diagnosed it or missed it and then I get back on my bike and then I forget so,(.) I don't know really with respect to lung cancer. NY25F.*

To summarise many participants viewed missing a diagnosis as a failure, and not just for the consequences for the patient but also the impact it has on their professional pride and aptitude to diagnose. The data highlight that missing a diagnosis can result in introspection on the part of the participants with some soul-searching and regret also experienced. A missed diagnosis is often viewed as a mechanism that can modify behaviour. The analysis was inconclusive regarding whether behaviour was permanently modified or whether this was a temporary outcome as participants' varying descriptions showed that it affected them in different ways. As discussed in section 6.5 individual differences were often verbalised through clinical performance, cautiousness and conscientiousness paradigms. One can argue that the conscientiousness characteristic highlighted by some participants may be the personality trait that influences individuals the most and modifies behaviours permanently.

6.6.2 Complaints

The issue of complaints emerged as a theme as did litigation. The decision for the two themes to remain separate was due to the variation in seriousness often applied by participants. It was viewed that a complaint is the first step in what could then progress into litigation proceedings. However, when discussing medical error, some participants did not differentiate between concepts, describing complaints and litigation in a similar fashion. According to NHS Choices (2013) each GP practice should have its own complaints procedure.

Several participants describe an increase in complaints in recent years and how this is in the back of their minds much of the time. Factors that may have increased complaints are changes in social context involving patient expectations, increased scrutiny of practice and policy changes that are linked to further transparency of organisational practice for or within the NHS family.

> *The complaints are getting more, definitely, but I mean, it's not something you think of consciously but I think you think ah well the, you think, if there is something that could be wrong.HU10M.*

> *On the other hand GPs get complaints a lot, I mean it's all relative but, let's not put numbers on it but it happens a lot and it's part of the job and, you know, almost know GPs saying I can't, and they start crying and just never come to work again, so they all deal with it in different ways, in their own ways.HU04M.*

There is some variation amongst participants on how they perceive complaints. These may involve relatively minor issues involving poor access to convenient appointments or a staff member being rude. Other participants describe complaints within the context of missing a diagnosis which can proceed further to the litigation stage. Whilst complaints and litigation seem to have differences in severity and impact on general practice some participants describe complaints and litigation within a similar context. For clarity, complaints can be the first step in a procedure which may or may not lead to litigation or legal cases brought against participants.

> *Obviously we know what complaints we've had amongst us, and we know what have gone to litigation, to legal cases, we've got two legal cases going on at the moment, and, that involves a number of us, that changes our behaviour, as soon as we get a, we get a, something like that, it changes our behaviour, we look very carefully in-depth at what happened, and we also, and we're doing that all the time because we do significant event analysis and we do that all the time on significant events that happen to change our behaviour or people with an unusual cancer diagnosis that we think well why did you pick, how did you pick that up?HU20F.*

The statement from the above participant HU20F raises an interesting viewpoint that complaints may lead to a change in practitioner or practice behaviour. The participant also describes the application of quality improvement strategies such as Significant Event Audits (SEA) to evaluate practice performance as a central process. Several participants describe how complaints can come through different channels, either direct from the patient or via other family members or relatives.

> *… it's always the bloody family who complains, you missed it or you haven't done everything, even though the hospital might have missed it, it's still, it's the GPs gets left out to fry, so you have to, just self-preservation makes you sort of want to, (.) be one step ahead, and that one step ahead, cancer is my bread and butter because if I don't get that right, I don't want my name in the newspapers for the wrong reason.HU19M.*

In summary a large number of participants seem alert to complaints and it is something that they were mindful of. It is a phenomenon that the majority of participants have had some experience of and it is often described within a negative context. The data suggest this may influence behaviour with an increase in the adoption of defensive practice. The drivers for the complaints seem multi-factorial and may be associated with the medico-legal system which can involve speculative claimants trying to gain financial compensation. However, within the data there is some variation in what is perceived as a complaint by participants. Some relate to complaints purely from a litigation perspective which can involve their defence union whilst others view complaints as a formal procedural process which is dealt with by the practice manager. These can relate to what may be perceived as minor issues involving access to appointments or poor communication from GPs or practice staff. It was suggested by participants that complaints often came via family members rather than patients themselves and sometimes it was not always financially motivated but a focus on establishing clarity and recognition of the complaint.

6.6.3 Litigation

Litigation was initially an unprompted and unexpected topic of conversation amongst participants when discussing the recognition and referral of suspected lung cancer. It was frequently suggested by participants that litigation is becoming an increasing occurrence within general practice with some participants linking litigation and lung cancer.

> *There's lots of litigation with lung cancer as well. Any one of us who's worked for even one or two years knows of somebody who's faced lung cancer, and so there is that as well.HU04M.*

Litigation is a phenomenon that has become an increasingly accepted part of general practice which has ramifications not just for the medical professional concerned but throughout the practice organisation. The increase in litigation within primary care has a far-reaching impact across the whole NHS system.

> *I think we've all moved into an increasingly litigious world where we do more and more tests and, you do wonder whether clinical discretion's part of it at times don't you.NL26M.*

However, one divergent opinion challenges the perceived increase in litigation and it is not having an impact on their practice.

> *I don't think it has had a great impact on us as a practice, I don't think we've kind of really had any like cases that have led to any litigation in, in the cancer area, I think people are more, more professional, you know, they're more worried about missing a cancer because it's one thing you don't really want to delay (……) just professional pride and, care in your work I think rather than litigation as such. NL35M.*

The statement by NL26M is a point for further discussion as the consequences of litigation creates conflict with what many participants believe as an important facet to their primary care role and as gatekeepers who co-ordinate and control access to specialists in secondary care and subsequently control the burden of cost to NHS resources.

> *I'm supposed to be a gatekeeper to not try and refer too many because it's costly to refer to the hospital, so that's why we're looked at because we're high referrers, therefore it's costing, the, the health service a lot of money because we're referring to secondary care.HU20F.*

Some participants describe the fear of litigation as a factor in the modification of their behaviour and driving up referrals which conflicts with some participants' beliefs about their gatekeeper role.

> *The fear of litigation is driving referrals, plus a general consumerism now that, that people, people will not infrequently come in and demand the referral and,*

> *and they will have a very strong feeling that it's not up to a primary care doctor to, to refuse that because they want it, there's quite a growing culture now that, you know, if I want a referral to specialist I can have one and that's completely conflicts with our gatekeeper role and our attempts to contain cost.NY21M.*

The majority of participants recall having some experience with litigation either directly or indirectly. These experiences were often related to a delay in diagnosis which involved the mismanagement of a patient's illness due to symptom misattribution or co-morbidities or a missed diagnosis. The causal impact may result in increased referrals due to adopting very cautious practitioner or defensive practitioner behaviours.

> *I think from my way of practising over these years has changed, it's partly defensive, which I don't like but I can't see myself doing anything else, it's a big mind set for me, I think the younger doctors who come in will do more referral and more investigations than the older ones who think maybe not. I don't know which the right way is but I really think defensive medicine is awful. ER16F.*

> *Litigation is a huge thing, and is it, it, it's a huge driver of referring people to hospital, it's a huge driver of admissions to hospital and it's not, it's not only fear of litigation, in fact I haven't got any direct experience of being personally involved in litigation but on a lesser level complaints, the possibility of adverse publicity, I don't know, probably just as big drivers as, for, you know, yeah, and I, I have some experience of someone threatening adverse publicity due to an allegation that we'd mismanaged someone's illness and it's a, highly unpleasant and a very big, you know, driver for the future.NY21M.*

In contrast some participants describe not having a fear of litigation but rather a more introspective viewpoint which impacts on individual's professionalism and self-pride with regards early diagnosis. If the core business of general practice lies within the patient consultation and the ability of GPs to effectively diagnose, it may be suggested that this burden as an influential factor and measures their personal performance as a generalist needs to be explored further.

> *I have had, one, litigation complaint, in my entire career, and that's actually at the moment, and I've had, I haven't had a written complaint other than particular*

> *litigation one, I haven't had a written complaint, from a patient, in twelve years, (.)and the one I got twelve years ago wasn't fair, so, I get hardly any complaints and I don't have a fear of litigation, at all, I have a fear of feeling stupid and I have a great fear of, of, letting people down but I don't really have, even now with this case hanging over me, I don't have a fear of litigation.NY33M.*

> *When I see the patient, the last thing in my mind is litigation, but, (.) though, I usually don't tailor my medicine, the way I'm seeing the patient with, for a fear of litigation (.) but I do try to explain to the patient, you know, that look I'm giving you these antibiotics, if you think they are not getting better come back, do you understand what I'm saying? So I think I'm preparing the ground for the litigation, but I will not, I don't usually alter my medicine………………Litigation usually doesn't affect my clinical decision making. Fear of litigation doesn't usually affect my decision making.NL34F.*

The statement by NL34F highlights a somewhat contradictory message. Whilst on one hand the participant verbalises how litigation does not influence how she practices medicine, however, on the other hand the participant does imply some form of safety netting and the suggestion of using safety netting as a mechanism if situations were to proceed to litigation.

The interview data suggest litigation is a major factor in modifying participant behaviour but it is unclear whether these modifications are a permanent and sustainable change or if they are short term change in reaction to the negative process associated with litigation. One hypothesis that could be considered is that it may relate to the seriousness of the complaint as discussed previously in section 6.5.5 or it may be related to the participants' individual differences and how litigation affects people in different ways.

> *Basically I try not to do anything in order, because of litigation, to avoid, to avoid getting, I try to do what I believe is in the patient's best interests and I do always have litigation in the back of my mind, but again that's a, it's part of the best interest thing really, if you do end up in a difficult situation where, in a litigation situation then that changes your practice absolutely hugely, and then you have to ask yourself whether you really are being over cautious and it's, it's really, really,*

> *really hard, [laughs] so I think, I think a lot of us do practice defensive medicine because we have to.HU23F.*

> *I think any GP who says it doesn't is a liar, I really, I mean all you can argue with it, is to what degree, but I think, I think it does, it's, I think it's human nature, I mean I think if you say it doesn't, it doesn't make sense, why wouldn't it and what's wrong with saying that it will? I mean I've not had a complaint but I quite confidently can say to you right now that it will change the way I behave, it's bound to, it might make me more likely to investigate one area in more detail where I've made a mistake, so I never make a mistake at least in that area again. It might make, I know from personal experience, other GPs who made a mistake in one area and after that have just lost confidence in that area to some degree and are referring everybody because they're so scared that they might make the same mistake again and again perfectly understandable, I think it affects you.HU04M.*

Whilst participants suggest an increase in litigation is driving referrals and defensive practice, some allude to certain socio-economic groups of the population exploiting this emerging phenomenon and see it as opportunity to generate income which is perpetuated by medical-legal solicitors wanting to make money.

> *I'm sure there's, I'm sure there's a culture which particularly amongst certain socio-economic groups which look upon a medico-legal claim as being a way of generating, easily generating an income. NY27M.*

What is important to highlight is that discussions about litigation, complaints and medical error were initially unprompted and at first unexpected. This became a dominant theme amongst participants when discussing the recognition and referral of suspected lung cancer. As highlighted earlier in this section the data suggest that GPs do think about missing a diagnosis when thinking about lung cancer and therefore the potential of litigation. One can assume from the data outlined in this sub-theme that the rise in medico-legal litigation within general practice is an unwelcome and often uncomfortable distraction and is a cause for concern regarding the future development of general practice.

To summarise, the majority of participants view litigation as becoming increasingly common. However, there is some variation amongst participants, as some are consciously aware of it and recognise that it influences their clinical decision-making, while others are pragmatic and attest that it does not affect any of their practice. What is evident within the data is the perception that litigation and complaints do modify participant behaviour, whether that is by increasing referrals or generally making them more cautious and defensive. What is not clear is whether these behaviours are permanently modified or whether they are just a temporary modification. It is suggested by some participants that the seriousness of the situation or significance of the error or delay may be an influencing factor as to whether it becomes a permanently modified behaviour or not. The severity of modification or seriousness of the situation is verbalised through participant accounts involving missing a diagnosis with children with cancer or rare diseases.

> *For example we don't want to miss (.) see the worst nightmare is misdiagnosing a child who has cancer of some form. Now does that make me a bad person that I'm more aware of that than an old lady? I don't think it does, it's just human nature, it's just how we, how we, how we are, so that's how, you know, how the area is as well we would do that, we all have our black spots and we all have our confident areas and general practice is a very varied thing.HU04M.*

> *Yeah, yeah, this was a child, so this is not sort of lung cancer but it was a child who got the diagnosis of a very rare disease, and, and in fact our involvement in it was simply to see a child, I think the child was initially treated as a, upper respiratory tract infection but, but didn't get better and then didn't get the child to hospital twice, so that's how, that's how we were involved in it, but then the child got a very rare diagnosis and a very serious diagnosis and the mother sort of, initially her reaction to it was right, I'm going to the papers and I'm going to say what this GP practice didn't, didn't do anything quick enough.NY21M.*

Finally, participant NY30M describes a view held by some colleagues of the relationship between appraisal processes and complaints. Whilst complaints are included in the appraisal documentation and within the appraisal discussion it is a small part of the accreditation process. There is suggestion within the accreditation process that having a complaint means someone is a poor doctor but as part of any re-accreditation process there should always be areas that result in reflection.

> *By stories of colleagues who have got sued or being sued, you know, the first thing you ask somebody on your appraisal at the moment is what complaints have you against you? What, what actions have been taken against you? To ascertain whether they're a good doctor or not? The inference being that if you're being sued you're a bad doctor and if you're not being sued you're a good doctor, well I personally think that's probably not true really but that's the, that's what's being done in terms of re-accreditation at the moment. NY30M.*

6.6.4 System referrals

It was frequently suggested by participants that the consequence of new government policy and the restructure of NHS organisations at a primary care level has the potential of impacting on recognition and referral of suspected lung cancer. Running in parallel with the restructure and the implementation of its new systems is the Government's drive to deliver cost savings and increase efficiency across the newly reorganised health system.

The majority of participants describe pressure coming from Clinical Commissioning Groups (CCGs) in order for them to reduce costs which have been placed upon them from new government efficiency initiatives. These cost reductions are via a number of channels varying from prescribing and a reduction in referrals potentially increasing delay and impacting on recognition and referral of suspected lung cancer. The data suggest the reductions in referrals and prescribing have been met with anger within the general practice community and from some participants and are viewed by others as a worrying direction.

> *I don't really know, mostly I find the whole new process, kind of quite scary and it makes me worried that people will be telling me that I can't do what I think is good medicine, and I don't think I can live with that, so I mostly just continue just to do my day to day job and we'll always just, just do that and if they, I'm told that I can only do ten referrals to respiratory in a year I'm not going to take any notice, you have to just do what's right by your patients but I think it's a very scary time because all resources are being squeezed and inevitably, I think everybody would like us just to have everybody here and never refer people and if, you're going to have a campaign that tells everybody that a cough for three weeks they should see a respiratory physician, you're going to swamp them, so it's really, it's really difficult I think but I kind of just feel I'm just going to practice my medicine in a way that I think is best.ER15M*

> *Everything we do now, everything we do is getting looked at in terms of how much resource we're using, so there is an impact, there is potential to impact on diagnoses that adversely affects referrals, you probably know that there's referral management going on at practice level, so in our practice we take a couple of disease areas, a couple of specialties and any referral going into that specialty has to be scrutinised by another person in the practice, so there's, so effectively there's a meeting which gives a second opinion on it. NY21M.*

The statement below by participant NY27M captures and contextualises the mood of participants rather well regarding the government departments giving mixed messages with its policy direction with the top down implementation of cost efficiency programmes within primary care contrasting with pressure from early diagnosis campaigns pushed out via Public Health England.

> *We live within an odd culture as a physician, because on the one hand politicians are telling us that we diagnose more, diagnose quicker, treat more effectively and increase in, in case of cancer survival rates. On the other hand they're also telling CCGs that you must refer less, investigate less, spend less money and make savings, and to me those things are incompatible, they're asking for the cake and to eat it, Unless we go down a culture and I'm not saying this is correct, in fact I think it isn't, unless we go down a more North American culture of giving everyone a total body scan every time they present with a cough, we will miss cases of lung cancer but the financial and social consequences of acting in that manner are, well dare I say it, irresponsible, if we're considering looking after the health and the finances of the population in general. It's a paradox and we're being squeezed really from two sides on that.NY27M.*

6.6.5 Summary

To summarise, the data suggest the restructuring of NHS organisations in primary care and the introduction of Clinical Commissioning Groups (CCGs) may have an un-intentional effect on early diagnosis and referral of lung cancer. The drive for efficiencies in the health system is recognised by many participants as important, however, the downward pressure from CCGs on participants to reduce referrals conflicts with many participants' beliefs regarding their operational autonomy and is viewed as a restrictive measure to limit their ability to make referrals for lung cancer.

6.7 GP and patient consultations

Howie (1996) states: "the core activity of general practice is the consultation and where a patient's problem may be assessed in biomedical terms; their hopes, fears, and expectations explored; and the effect of their social situation discussed" (RCGP, 1996).

Whilst the previous sections have focused on clinical decision making, differences in practice structures and practice culture and how these influence the recognition and referral of suspected lung cancer, this next section will examine the data regarding GP-patient consultations. A number of sub-themes that emerged from the data explore patient relationships and highlight differences within consultation style, views on access to general practice and the impact that has on consultations and relationships and participant's attitudes towards lung cancer.

6.7.1 GP and patient relationships

The importance of patient relationships was frequently mentioned by participants and in particular the value placed on developing rapport and establishing trust with patients to help facilitate obtaining important information to enable appropriate decision-making for the recognition and referral of suspected lung cancer.

> *I think the other first line, they would, first of all patients have, if they have a rapport with the GP, they're more, well definitely more likely to come in to just have a chat, even if they, they just wanted, some of them just want to come and say I just want to ask you, I've got this cough, do you think it's something of significance? ER16F.*

> *I mean it's, it's not just, you know, what do you want or what do you need? It's about, you know, how is your son by the way? You know, you've got, how is your injection you had two weeks ago, is it helping your knee?...................................*
> *...... so no it's just, you know, the sense of that you have something that is going to help you, he's not going to criticise you, he's just going to, it's going there to support you as well, right? I think that, that part of the relationship is absolutely vital, if you don't get that trust, you don't progress with many patients.HU18M.*

Additionally, whilst the participants value the importance of developing rapport with patients there are some views that patients may with-hold information if they don't trust or feel comfortable or confident in communicating symptoms, this can lead patients understating the severity of symptoms leading to system delays.

> *I think there's a sort of, there is, a sort of patient who, who, who doesn't feel comfortable talking about themselves and about their symptoms and difficulties and will try and spare you as the doctor from hearing a lot of what's going on, so they, they can't, they give an account of themselves which is much less severe than the reality.NY32F.*

> *Occasionally patients will withhold key pieces of information, you might say well that's, that's our fault for not teasing that out of them but someone who gives a good account of themselves I think often, makes diagnosis a lot easier.NY27M.*

However, not all participants have the same view that it is important to establish rapport and trust with some evidence of variation between participants and their emphasis on investment in relationships between themselves and their patients. One participant describes a rather bullish and doctor-centric approach within his patient consultation with regards to smoking, whilst another alludes to the analogy of a conveyor belt used in patient consultations and the challenges of patient's attitudes and the often complex nature of patient consultations.

> *I think we are quite good at bollocking people about smoking and part of that is, might be for, them being mindful why you want them to stop smoking and frankly we never discuss heart disease and we don't really talk about COPD, we talk about lung cancer because it's awful, and if you smoke you're going to get and if you don't smoke you won't get it and it's a very black and white subject, whereas just saying well you've got COPD and we can moderate your decline, it's a bit more touchy feeling for them to, whereas lung cancer's bang in your face and that's what it is. NY30M.*

> *If people are just thinking of the immediate and they just want to churn people through as if they're on a conveyor belt, as quickly as possible, then you're not going to think of lung cancer, you know, if somebody comes in and says oh I've got a chest infection doctor, I'm, I'm, you know, I've had a cough and I need some antibiotics, you just give them antibiotics. ……………………………………………*

> *So, and there are some GPs who do work like that who work, you know, they can work to five minute appointments and they just churn people through and you're going to miss people then, and also if you don't think, yeah, if you don't ask the questions and if you're not thinking latterly really because not everybody who's got lung cancer is going to cough up blood, you know.ER07F.*

Additionally, there can also be advantages of not knowing your patients and having a distant relationship as one participant states:

> *You will see someone who you don't know very well who will come and tell you everything because they don't like telling their usual doctor their symptoms because maybe they feel that they've hid it for so long they'll get into trouble, I've had that several times, and so they feel that seeing a fresh face is easy for them because they can just sort of blurt it all out. They, they're, they can be quite challenging because you're kind of thinking, you know, you always see so and so, is there a particular reason, you kind of trying to get to the bottom of why they've come to see you but you can't do it straightaway, you have to kind of use certain communication skills within the consultation to try and get that out of them but eventually it comes out, yeah.HU05M.*

To summarise, the majority of participants view the importance of good interpersonal communication between themselves and patients to reduce barriers and obtain important information within the consultation to enable effective decision making. Transparency and trust between both parties is also seen as an important factor by participants which may be a facilitator for the recognition and referral of suspected lung cancer.

6.7.2 Access to general practice

According to Bjerager (2006), GPs act as gatekeepers and distinguish patients who can be investigated and treated in primary care from patients who need specialist care. The majority of participants recognise the importance of good access for patients into general practice and most describe offering good access to appointments in their own practice.

> *Our patients receive a lot, we've got very good access and I think patients can always get seen the same day to be quite frank. NY29M.*

> *We're fairly easy to get appointments with, relatively speaking, we've deliberately made it so, and, so most people will, if it's something acute they might, they'll see any doctor but they would, that they would have one, or two doctors that they would want to see for their on-going stuff so I, yeah, I tend to know my patients fairly well, but you kid yourself you know them very well but you don't, but you know them fairly well. NY33M.*

Furthermore, there is one participant viewpoint who questions whether access poses the significant challenges patients sometimes face through contextualising these issues as a myth.

> *I suppose the problem is that there is a myth, we know that there are plenty of myths out there about how difficult it is to get, GP appointments, but if you ring up and say I need to be seen today, generally speaking you will be seen today.ER01M.*

One observation within the data which is frequently stated by many participants is their perception that their own individual organisation does not suffer with patient access issues and is not a problem for their practice population however; they do recognise some other practices having poor patient access.

> *I know some practices, not ours, have got poor access to GPs, and, I think practices increasingly are taking on more and more work from secondary care, and more, and also, more and more administrative work, so, so time's getting squeezed and squeezed and squeezed, so there's, you, you tend to find your days getting fuller and fuller and fuller with each progressive Government.NY29M.*

The inferences from the data suggest participants may view this as consciously or subconsciously projecting defensive behaviours in what may be perceived as an incursion on general practice. Furthermore, it was suggested by one participant there is an association between population groups with a higher incidence of lung cancer and those who are less likely to have good access to healthcare provision. The inferences being higher incidence of lung cancer are associated with a higher smoking prevalence population which is often attributed to lower socio-economic status and thus suggesting poorer localities and populations have poor access to general practice (Tudor Hart, 1971).

> *One would probably expect higher incident rates of lung cancer to occur in certain population groups, and those population groups, generally speaking, probably have less good access to healthcare advice and healthcare provision.NY27M.*

The caveat to the statement by NY27M is there is also recognition that patients from lower socio-economic groups have to take some responsibility for accessing general practice. As one participant who practices in a deprived ward in Hull points out, just creating accessible appointments does not guarantee successful access as other social factors are often more influential and contribute to high did not attend (DNA) rates.

> *Sometimes we have had, we have lost even ten appointments in the morning and say why people are not coming, why, we're offering them appointment and they're not coming, it's too early for them? So how is the pattern of life out there, is the, I don't know, is it related to drugs or consumption of alcohol? Watching TV too late, I don't know, it's, but it makes a challenging practice, you know, in terms of how you administer the appointments and, and clinics and things and the number of DNAs, it's supposed to done, done by poll, with a number of minutes.HU18M.*

> *Access is important then, and telephone and appointments, if you, if you ring for an appointment and it's in two weeks' time most likely you will DNA the appointment when the time comes, especially with the group that we handle in Hull, you know, so if you can book an appointment in a week, I mean when I, when I see an appointment done a week ago, I say he'll probably DNA, and it's right, so two, three appointments were done yesterday on my afternoon clinic a week before, two DNAs, because it's too late, so you, they want to come, you know, today, tomorrow. If you give three or four days they, probably they don't come, they don't, they go to A&E, they go somewhere else they are very impatient.HU18M.*

Additionally, the data suggested there is some variation on approach to appointment systems with each practice adopting their own appointment systems in response to their practice population. These differences involve the availability of same day appointment, pre-bookable appointments; extended practice hours, telephone triage and consultations and fixed list or a general practice list.

> *I think the speed of which people can get appointments or the ease of which people can get appointments is probably the main consideration, and we've moved here to*

> *a book on the day system predominantly, we have some pre-bookable appointments. So people who, who don't work or are retired generally find it fairly easy to get an appointment the same day, but it's, it's more of a challenge sometimes for people who work and that's the kind of feedback we've had from patients, that they want more pre-bookable appointments and we keep adjusting, our appointment system and trying to, accommodate that without losing the, ability for patients to book on the same day.ER12M.*

> *Well I think we're kind of evolving the appointment system there, and when the chap was here before he had about, I think it was between twelve and fifteen appointments twice a day and wasn't anything else apart from that, there was, there's a nurse here who's very good, who does a lot of phone triage and, she was probably being relied on a bit too heavily and now that we're kind of involved in things, we've now got a number of doctor triage slots, each morning and afternoon, so if appointments get filled up then they've got through to the doctor for a triage, so they, that works quite well.NL35M.*

By way of contrast, some participants highlight the benefit of not using the same GP. Seeing a different doctor allows for a different viewpoint which can help cut through any bias towards the patient and allow for an objective decision with the potential of reduced delay and earlier diagnosis.

> *They can choose to see one doctor for continuities but at the same time it's also helpful that they can see another doctor because sometimes it's, we get second, I mentioned about the patient who had come twice and had antibiotics, for that, cannot see them, of course as another doctor you look at it from a different angle, it could happen the other doctor, they saw them again they would, so we tend to get cross consultation among patients and patients can see any of the doctors.NL36M.*

> *I've told the partnership if they've seen me six times in a row maybe they should see someone to have different viewpoint, because if you're seeing one person all the time you get jaded or, I don't know, you get dulled into their constant way of saying things, maybe they see someone and they see a different thing into it, comes up with a, so we have mentioned that, haven't really work, for some patients just want to stick to one patient, one doctor.ER16F.*

In summary the data revealed that the majority of participants recognise the importance of having good access to general practice with many participants' perception being that their own practice does not experience poor access. Access to general practitioners has long been a contentious issue for both patients and general practice with evidence suggesting that poor access can increase delays and impact on patient's quality of care and outcomes. Delays in the recognition and referral of suspectedlung cancer can be attributed to poor access to appointments in general practice (Walter, Webster et al. 2012). The vast majority of participants are aware of the different groups in their practice population and describe responding accordingly by adopting differing access strategies and appointment systems. These involve extended working hours offering earlier and later appointments for working people to access services, same-day appointments, pre-bookable appointments, telephone triaging and consultations and general practice list and individual fixed lists. A number of participants also highlight the variation between deprived and affluent practice populations and how these differences can impact on practice activity and access potentially creating delays in the recognition and referral of suspected lung cancer.

6.7.3 GP attitudes

Within this sub-theme the participant responses relate to their own experience of lung cancer outcomes.

> *No I don't think it's less worthwhile. I think people will argue about the relevance of the rapidity of getting people into 2 week waits. I think there are some legitimate concerns about a chest x-ray which clearly shows that the patient is not going to have curative treatment, being rushed through the system.ER01M.*

> *Always a controversial one because one where there is a little bit of the attitude of well most of it's due to smoking so it's kind of been brought on by themselves and if you look at sort of funding for research and things like that breast cancer has masses and masses of funding whereas lung cancer, I guess it probably doesn't have anywhere near as, as much, as much funding. I wouldn't say it's not worth diagnosing, the problem with if we take breast cancer versus lung cancer is, whether it is treatable at the stage where you're picking up I suppose because breast cancer's had lots of investment in it and has screening and everything else that quite a lot of the time when you pick up breast cancer there is a decent*

> *chance of a cure with, with breast cancer. With respiratory cancer well there is but some types of respiratory cancer, the chance of a cure for that cancer is pretty low and your treatment options are mainly sort of palliative, you're getting, so I suppose that's half a reason while there's a bit more drive behind breast cancer than respiratory cancer (.) ………………………………………………. I wouldn't have said it's, it's a more or less important one to diagnose, it's just, you do have the awareness that if you are diagnosing lung cancer, the majority of the time you are diagnosing something that is going to be incurable.ER13M.*

> *I don't think so, no. I think (...) I think you'd want to prioritise all of the other, because cancer is cancer, it sounds awful but it is and, whereas breast cancer gets a lot of publicity because it is an important cancer, I think the perception, well I don't, I don't think, I can't imagine any GP would have the attitude that lung cancer is not as significant as, as any other. Yes okay, you could argue that it's perhaps one of those that you can prevent, it's preventable but by no means once it's diagnosed should that alter your attitude to the outcomes or management of the patient at all, because it's just as important as, as, in my, in my, you know, my belief system that, as any, as any other.ER05F.*

The accounts described by ER01M, ER13M, ER05F capture some important understanding regarding participants' attitude towards the recognition and referral of suspected lung cancer. The three accounts suggest whilst there is some recognition of lung cancer having a poor prognosis the majority of the time it is still viewed as an important cancer to diagnose and still worthy of investigations and referral no matter the stage of presentation. The data highlights an important perspective regarding the perceived differences in financial investment between the various cancers, with breast cancer being seen as the most favourable for investment compared to lung. The comments suggest some form of hierarchy of financial investment amongst the different cancers using survival outcomes as a measure.

> *I think it's not very good, depressing also, I think it's compared to, if I just, even breast cancer's pretty good, if I look at colon cancer's pretty good, but lung cancer stands somewhere close to pancreatic cancers, which is the worst I think, don't take me, but I'm just thinking any pancreatic cancer, however earlier found, even if it's just a nodule, good gracious me, so awful, but lung cancer not very good,*

> *because I think most of them already have a poor lung functions, you know, the, those who have cancer already have COPD or some aspect of it and then they go in with that and then they have a problem with the lung and, it's just not taking it all, so I don't think it's very, very, you know, I think it's fairly depressing.ER16F.*

The comments made by ER16F describe a hierarchy of different cancers and the survival outcomes for each one. The inferences that can be made from this are the participants' awareness of the different survival outcomes for each cancer and the thinking process that occurs regarding patients' survival chances.

> *Yeah, people don't get better from lung cancer, yeah. (.) Yeah, (.) experience is that people die from lung cancer and they don't have generally that long to live. Maybe, some people might have a year or two or a little bit longer, but not, like other cancers you can diagnose early or cure or get rid of, or they'll just lie there but lung cancer tends to be quite a nasty cancer in my experience, although I know that there are people that have lived with it for a number of years, that's the exception rather than the rule I would say.NY20M.*

> *Very depressing. We have very few patients who get diagnosed with lung cancer that do well, and I can think of some particularly nice people I've looked after who've died because the stage at which their disease has presented has been such that nothing the hospital's been able to do has made any difference.HU22M.*

> *My experience of outcomes is not good it's a small minority of patients who do well after a diagnosis of lung cancer, by doing well I'm meaning not just curative treatments but good, good prognosis in terms of life expectancy. The majority don't do well and by saying not do well I think I, I'm struggling to think of maybe one or two odd cases, that patients who've lived more than a few years after diagnosis. NY27M.*

For the majority of participants lung cancer statistics conjure up negative and depressing views with little optimism of a positive outcome for many patients once lung cancer is diagnosed. However, there is no intimation of participants not wanting to diagnose lung cancer quickly and as one participant emphasises the importance of retaining hope with patients.

> *Don't remove the hope support them as much as possible, in going through this treatment. They do come and ask doctor, should I go for the treatment and I will honestly say I will if I have even a little bit of a chance of clearing and what did your consultant say? He says well he could try with this and I said then I would go with it but if they come back saying secondaries everywhere and it's palliative, then it's different isn't it?.. I don't think you should remove hope from the patients.ER16F.*

6.7.4 Summary

In summary very few participants had experienced patients who had survived lung cancer longer than three years. The majority of participants describe a poor prognosis of lung cancer and the majority view lung cancer as depressing with some intimating the limitations in treatment options for lung cancer. However, a very small minority of participants did mention experiencing positive outcomes with some patients having a lobectomy and increasing the survival time through new chemotherapy and radiotherapy treatments.

6.8 Complexity in general practice

The definition of complexity for this thesis is within the context of patients presenting with multiple and complex symptoms nested within a plethora of wider social factors. According to Innes et al. (2005, p. 48), "all consultations may be analysed in terms of complexity. However, in the pragmatic world of day-to-day general practice, some consultations are straightforward and such an analysis is not needed to help our understanding of them, for example, consultations concerned with matters where actions and intended outcomes are easily agreed between patients and doctors".

Within the participant data a number of sub-themes emerged highlighting the often complex nature of general practice. The sub themes relate to patient factors and the myriad of clinical presentations which were vague and sometimes difficult to categorise coupled with wider social factors and patients' individual differences and characteristics.

6.8.1 The complexity and diversity of presentations

The data revealed a level of complexity in general practice when considering the recognition and referral of lung cancer. This complexity was often contextualised when patients present with a web of symptoms or non-specific symptoms. A web of symptoms can be defined as patient presenting with multiple symptoms and issues which they may have stored up over time and then present to the GP and it is then left to the GP to navigate the myriad of symptoms and work out which is the most serious. An additional layer involving a patient's social factors can obscure matters for GPs, and sometimes distracting them from the appropriate referral pathway or from recognisng symptoms.

> *I guess the problems lies in, in the patient who actually comes along with this huge, err, web of symptoms that are interrelated and you know, they come in complaining about a set of social circumstances, they will mention, err an arthritic knee, they'll mention, err maybe a bit of their indigestion playing up. And at some point they might just slip in something, but actually the important thing.ER01M.*

> *Some people may have like non-specific symptoms, you know, they do not present, chest, chest pain, shortness of breath or haemoptysis, they may just present with other things and you may, you know, like night sweats or, or just weight loss and there's lots of causes for those kinds of things, so it, you think ah there's something nasty going on but, how do you know it's lung cancer rather than stomach cancer or any other cancer.HU10M.*

> *Well I think, yeah, it's that seeing through, seeing through the sort of fog really because they often have chronic ill-health, chronic long term conditions, often several long term conditions and, (...) a deterioration of a functional state is, is often the main giveaway to the lung cancer but that's often part of the progression of their other conditions as well, so, it's trying to be alert for quite small clues sometimes.ER12M.*

Some participants highlight lots of causal factors and the potential of a differential diagnosis which can lead to distractions and the wrong diagnosis.

> *The problem sometimes arises, you got a long list of patients to see and somebody comes at the end of all that and right doctor, I've been waiting to see you for three years now, I've got a handful of problems and. God. So you, you know, and one of them might be something, you know, my toenail's gone green or whatever and then, oh by the way I've got this cough or whatever, and then that's, that's, that's*

> *the bugger that gets you and you know that they're going to struggle to get back in to you, either because you're chocker block or they don't see you and so the, it's, it's, it's, that's, that's the key sort of problem.HU19M.*

> *Well it's that losing the, the sight of the wood from the trees isn't it? You know, the people who present with lots of things, I can think of an old lady I've got at the moment and it's not respiratory, she's got bowel problems and she's as mad as a box of frogs, but not personality disorder, she's not really mad but she presents all the time and her history's all over the place, I could miss all sorts of things there, so it's not coming neatly, she's not coming in, telling me neat symptoms where I'm thinking ooh yes, definitely have, yeah.NY25F.*

A common theme amongst the above quotes is the multiple problems patients can present with which can often result in additional pressure and stress placed upon participants to identify what is the most important symptom to focus on.

A viewpoint from one participant suggests patients presenting with multiple factors can cloud decision-making and the symptom or presentation is just too vague to consider a diagnosis.

> *I was going to say patients presenting with multiple things but I'm not sure if that's true but it is, it is something which clouds the, the picture for you, they're coming with three or four things, even the lung cancer patient don't turn up with one thing. Erm, (...) I would say the biggest thing is not thinking, is that vague, is that too vague? I'm just not considering the diagnosis.NY33M.*

In addition, vague symptom presentation can be further compounded due to the diagnostic sensitivities of chest x-rays. It was described by some participants the limitations in the sensitivity or reliability of a chest x-ray and whether it was the most appropriate diagnostic tool for lung cancer.

> *I think in Radiology, we've got, I can think of three cases of normal chest x-rays, where, who've been reported as normal in lung cancer patients who'd actually got active lung cancer.*

> *Right, and it's just purely based on the sensitivity of the test?*
>
> *Yeah, and, and, and really, so that would then reassure a lot of GPs that the patient is okay, when they have, when they're in serious trouble.NY29M.*

> *If we're increasing the number of chest x-rays, whether we would be, have, it's how many false positives I guess that we were getting versus how many lung cancers which potentially you could do something about, you're picking up and I don't know that purely on a chest x-ray whether those numbers would, would work out particularly, particularly well for lung cancer. …………………………………………………….*
> *And like I say it's, it's, it's fraught, fraught with difficulties, if there was a, a better test with better, better specificity and sensitivity then yes.ER13M.*

Patient personality or individual differences can contribute to the complexity to diagnosis. These were described in various guises relating to stoical types which were sometimes perceived as a generational thing or fatalistic or nihilistic attitudes of patients.

> *Probably sort of between forties and sixty five, (.) yeah, although you do get some stoical older gentlemen as well who are a bit older who don't want to bother their GP.NY31F.*

> *Yes, some of it's down to their own personality traits and some people only come to you when they've been suffering for months don't they? And, you know, typically the stoical farmer types, you know, they only come to you when they've had symptoms for a long time, you know, they really don't whinge about things, and then you may have, the middle class, Guardian reading teachers who come as soon as they've got a symptom, because they're very aware of their health.ER07F.*

The participants suggested fatalistic and nihilistic attitudes amongst patients which create additional barriers for participants establishing rapport and trust.

> *I do think the patients almost have an attitude of this is something I brought on myself and, so they are either more accepting of it than, than others, (.) because I guess people, most people want to know why they've got a cancer and, and if you've got a lung cancer you, you kind of probably know.ER15F.*

> *Yeah, they're a sub, they're a less valuable subgroup in society and, so and they have an expectation that because they smoke they're going to get ill as a result of that. I don't think, you know, anybody now feels that smoking's not harmful, I think, you know, everybody knows that, and they feel that, you know, to some extent they get what they, they deserve and so then tend to seek less help for that, and some of that is society's attitudes towards smokers by pushing them out, and in the health service, you know, some doctors, you know, can be quite judgemental about smokers.NY28M.*

> *If you look at the lung cancer demographics they're frequently elderly and there, they either have it in their subconscious that they've got it and they don't care or they don't, too frightened to talk about it, or they just have such respect for the medical attendant that they don't want to bother them or whatever, whatever the reason is but they don't seek help very early, so they've usually got convincing symptoms.NY30M.*

> *Hull's smoking rates are phenomenal but we also have a lot of fatalistic attitude, which is just one of those things really, smoking, getting lung cancer, just one of those things, but we as, we as medics can't afford that complacency, you know, oh that's alright, oh I'll put you down as, I'll put you down as sort of, you know, somebody who's not going, not bothered, you've got to still work on these people and try and get them to stop smoking.HU03M.*

Furthermore, cultural differences and ethnicity are perceived by some participants to increase complexity of lung diagnosis and contribute to delay, as one participant's account states:

> *But yeah, there is, there is a, there is a perception that, er, and I mean maybe one of the precisions of the lung cancer thing is I only saw one or two of it but they were all blokes, maybe they should have all been younger people, maybe they should have all been women, and maybe they should have all been black people because they don't present early either.*
>
> *Right.*
>
> *It's a black thing that you don't, you don't believe that you've got a serious illness in, culturally and don't present, black men don't present, and the worst are Chinese*

> *men, they never present with anything until there, it's just growing out of their chest, you know, and they have a high incidence of lung cancer because they have a very high endemic smoking rate.NY30M.*

To summarise, the data suggest there is a level of complexity in the recognition and referral of suspected lung cancer in primary care. These involve patients presenting with multiple problems or symptoms which can lead to distractions and pursuing different directions and lead to delays in the recognition and referral of suspectedlung cancer. These multiple symptoms were also further compounded by participants' perceptions that patient's individual differences which involve stoical and fatalistic attitudes can create an additional layer of complexity through which participants had to navigate.

6.8.2 Burden of disease

GPs see many patients with respiratory problems and this has implications for the recognition and referral of suspected lung cancer. The inferences being whilst GPs may adopt a lower threshold due to the amount of respiratory patients they see, additional complexity is created due the large numbers of common viral infections.

> *So it's, yeah, so I mean most, most GPs will tell you that really, because it's the sheer, it's sheer volume of stuff you've got to guess really, you can't sort of, you can't, it's difficult to make it up really, because every, because as, you know, as you say, you know, people, they want the answers like that.HU03M.*

> *The sheer number of patients that come to us with shortness of breath, wheeziness, chesty coughs, even blood in their sputum or from their stomach, is a lot, I wouldn't want to guess but it's a significant percentage of patients I see.HU04M.*

Furthermore, some participants highlight the association between socio-demographics and deprivation with the volume of chronic disease and lung cancer. This has been discussed in some detail in section 6.4.1.

> *I think if you work in a deprived area, then you must get very used to the high levels of the sorts of diseases that you see in those groups of patients. Whether it's obesity, whether it's therefore type 2 diabetes, whether it's ischemic heart disease*

> *or whether its smoking related diseases such as lung cancer or COPD.ER01M.*

> *So that's because we have a high number of chronic smokers, chronic lung condition patients, like COPD and asthmatic patients, so then all this about, cancer, lung cancer, I think that Hull here has got the highest level of lung cancer, so we've got to be thinking about it.HU17M.*

> *We're in the north, we're in a working class area, there's a lot of COPD, this isn't a mining area but I used to work in Doncaster where there was a lot of other lung conditions as well, occupational ones, but there is a lot of asbestos related lung disease in Hull, so we have proportionally, nationally, we have a higher number of lung diseases than the average.HU04M.*

6.8.3 Summary

To conclude, the majority of participants indicate a high awareness of lung cancer with many alluding to experiencing large volumes of patients that present with respiratory symptoms on a weekly basis. The data also suggest many participants are thinking about lung cancer on a daily basis which reflects their practice population and the socio-demographics with participants making the association between deprivation, high smoking prevalence and high volume of respiratory disease. The data suggest there is some variation in participants thinking about lung cancer and the volumes of patients with respiratory disease. This may be an influential factor within the participant's threshold for the recognition and referral of suspected lung cancer.

6.9 Summary of the interviews

A total of 36 general practitioners were interviewed across four different geographic localities, Hull, East Riding of Yorkshire, North Yorkshire and North Lincolnshire to ascertain knowledge, views, attitudes, experiences and perceptions of the recognition and referral of suspected lung cancer. Five key themes emerged from the analysis with seventeen sub-themes being derived from those five main themes.

A key theme 'How GPs make decisions' described a consistency of risk factors which alerted them to patients who were more at risk of lung cancer. The risk factors included smokers, the elderly, and working class patients with an increased suspicion focusing on the male gender. Participants were also consistent in what they viewed as red flag symptoms for lung cancer. These included persistent cough, breathlessness, haemoptysis, weight loss, chest infection and hoarse voice. Additionally, many participants viewed atypical or challenging presentations as difficult to recognise with many recounting stories of the complex, vague and unusual nature of some presentations. Participants also described the difficulty in recognising and referring patients with comorbidities especially COPD.

There was a consistency in the description of analytical paradigms but there was some variation about what was considered intuition and what was defined as pattern recognition. One theory to be considered was intuition is really just pattern recognition and is based on participants' years of experience.

The data suggested educational practice characteristics may be a facilitator of an organisational culture that enables practice staff to share and spread knowledge and up-to-date research. Inferences from the data suggest educational practices may deliver a higher quality of care compared to non-educational practices. Furthermore, the findings highlighted social structures involving informal gatherings such as 'water cooler' conversations. These were viewed as a useful mechanism that facilitated the dissemination of knowledge and educational information. The informal mechanisms were anchored beyond normal organisational parameters and involved knowledge transfer at coffee breaks, lunch time and early evening to discuss patients, recent evidence and research. Some participants described it was expected within their own organisational culture to actively participate and engage in this process. In contrast, the data highlighted a formal process. This often revolved around business meetings or formal learning structures within educational practices. The data suggested there is an interface between quality improvement and the use of the audit tools such as Significant Event Audit (SEA).

The analysis revealed the importance of efficient and effective internal organisational processes which may influence the recognition and referral of suspected lung cancer. The efficiency of internal systems that are able to obtain results quickly is viewed as reducing system delay.

Questions which related to a participant's personality or individual differences were often described through the lens of clinical performance. This was often within the context of referrals and the differences between a cautious practitioner and a conscientious practitioner. There was some variation amongst participants with a cautious practitioner being viewed by some participants as a non-confident doctor due to the high referral rate and a conscientious practitioner being viewed as a safety netting procedure.

A key theme highlighted the different pressures facing general practitioners. The pressures were described in various guises which involved personal performance. Missing a diagnosis or the opportunity to refer into the appropriate pathway resulted in introspection and diminished pride at not getting a diagnosis first time.

The data revealed that the majority of participants perceived a shift in public attitudes towards complaints and litigation with many experiencing increases. There was some variation between litigation and a complaint. Some participants viewed complaints as the first step towards litigation, whilst others saw complaints as important but relatively minor, often being dealt with in- house by the practice manager or practice staff. Litigation has been categorised separately to complaints within this thesis. The majority of participants were alert to litigation with some variation amongst participants in its influence on their clinical decision-making. Some are consciously aware of it and actively safety netting while others attest that it does not affect their practice.

GP and patient consultations emerged as theme from the open ended interviews. The majority of participants recognised that good interpersonal and communication skills were important which established rapport. This was a facilitator for effective discussion and clinical decision-making. Participants also viewed the importance of having good access to general practice with some describing the adoption of differing access strategies to accommodate the variations in their practice population. However, many of the participants didn’t perceive access to be an issue within their own practice.

Finally, participants suggested there was a level of complexity in the recognition and referral of suspected lung cancer. The majority of participants described complex patients with multiple symptoms which can often lead to difficulties in clinical decision-making and potential delays due to the use of an inappropriate pathway. This complexity is further fuelled by the sheer volume of patients presenting with respiratory symptoms often reflecting the socio-demographics of the practice population. However, the inferences that can be made from the data suggest the complexity and the sheer volume of patients may influence a participant’s threshold which results in it being lowered when there is a suspicion of lung cancer. The study’s findings suggested certain risk factors involving age, gender, social class and smoking alerted GPs. In comparing this with the recent epidemiological research by Iyen-Omofoman, Hubbard et al., (2011), whose study examined the distribution of lung cancer incidence across sectors of society found the highest number of incidence of lung cancer amongst Mosaic Public Sector Types called ‘Cared for pensioners’, ‘Old people in flats’ and ‘Dignified dependency’. These sector type profiles produced by Experian are underpinned by factors involving levels of education, reliance on benefits and lifestyle factors including above average smoking rates.

Chapter 7

Findings from the think aloud case study involving clinical case scenarios

7.1 Introduction to chapter

As described in chapter 5, this study consisted of interviews with GPs in two distinct parts: open ended in-depth interviews and think aloud using clinical case scenarios. This chapter reports the findings from the think aloud analysis from the four clinical case scenarios that were presented to each participant.

The method used in this chapter is described in detail in chapter 5 section 5.5. The findings from the think aloud method will be presented via a range of tables with supporting verbatim transcriptions to give the data some context. The rationale for the quantitative aspect to the think aloud findings was not only to facilitate ease in understanding participants' main verbalised cognitions but also to establish a weighting of different verbalisations to aid comprehension of cognitive patterns. Each table comprises a range of terms which have been given a weighting and represents the number of times participants verbalised those terms evaluated using the coding framework. The terms reflect participants verbalising the same clinical decisions and voicing a similar sequence of thoughts and processes.

7.2 Clinical case scenarios

The four clinical case scenarios that were presented to each participant are shown in boxes 7.1 to 7.4. The scenarios vary in complexity and symptom presentation and were developed using a range of different sources which included: recent cancer literature and NICE guidance, guidance from supervisors and tacit knowledge gathered by the student's previous experience working within an early diagnosis of lung cancer environment.

Box 7.1 Clinical scenario number 1 - Male patient presents to your Monday morning surgery after requesting emergency appointment.

Social history

John is a 57-year-old married man with two grown up children in their 30s.
He works as a self-employed plumber and is the breadwinner in the home.
John works extremely long hours to make sure there is enough income to be able to pay for the mortgage, bills, and holidays.
He smokes about 20 cigarettes a day, and has tried almost every year to stop but due to stress from work he just can't seem to quit.
He often works both Saturday and Sunday to gain as much income as possible and has very little time with his family or for himself.
John has not been to the practice in six years and has presented to you first thing Monday morning.

History of presenting complaint

He presents with a noticeable cough that is a distracting factor when having a conversation and he alludes to the persistence of the cough and describes minor haemoptysis but has concealed this from the rest of his family as he didn't want to disturb his family holiday plans

Past Medical History

He is a long term smoker and has tried to quit on a number of occasions.

Box 7.2 Clinical scenario number 2 - Breathless patient attends surgery.

Social history
Margaret is a 61. She lives with her husband Bob and together they have three children in their 30s and 7 grand-children.
Margaret does very little exercise as she has always been overweight and found it difficult to do exercise because she becomes tired and breathless very quickly.
Margaret previously met her old friends every Thursday and Saturday at the social club but is unable to get there recently due to the progressive nature of her ill health.
Margaret has recently retired from her job as a dinner lady in a local primary school.

History of presenting complaint
She now presents with worsening breathlessness and now struggles to walk across her front room without becoming distressed.

Past Medical History
A long history of smoking and moderate COPD.

Box 7.3 Clinical scenario number 3 - A male presents to the surgery with unexplained weight loss.

Social history
Charlie is a 70-year-old widower who lives alone in his council house in North Hull; he has no children of his own.
He is a retired dock hand and spends most of his days either at home, or at the local social club.
He drinks quite a lot of alcohol at home and doesn't eat very well and tends to eat pasties and chips.
He's still quite mobile but doesn't own a car so tends to either walk to local venues or get the bus.

History of presenting complaint
Charlie has presented to the surgery concerned with chest pain and breathlessness and mentions weight loss in the last few months.

Past medical history
He is an ex-smoker for 15 years and as a dock hand he was exposed to asbestos. The previous consultation which was 12 months ago mentions his having shortness of breath. His last CXR was normal.

Box 7.4 Clinical scenario number 4 - Patient attends surgery. You are not her usual doctor.

Social history
Carol is a 47 year old mum with two children she is divorced from her husband twelve years ago. Her children are in their early 20s and have left home.
Carol is a business manager in a clothing factory where she has worked since her early twenties after leaving university.
Due to her long hours Carol usually ends up in the pub straight after work. Her daily diet will consist of pub food and a large number of drinks as she has no commitments back at home.

History of presenting complaint
Carol presents to you showing signs of breathlessness, having night sweats, looks cachectic and a hoarse voice.

Past medical history
Carol is a non-smoker, heavy drinker, high blood pressure, and has had past household contact with TB via the Grandmother. Previously diagnosed for depression.

7.3 Coding framework

The coding framework was adapted from Johnson, Sheard et al. (2012) and Lamond, Crow et al. (1996) which resulted in the following codes being developed: **Collect, Evaluate, Examination/Management, Diagnostic, Referral, Diagnosis, Reason** and **Safety-netting**. The different codes compartmentalise participants' verbalised thought processes. Each code represents a stage in the sequence of the participant's thought process and is designed to enable further understanding of their clinical decision-making. The eight codes are described in detail below to establish clarity and context of the coding framework.

The **collect** code represents questions asked or statements made by the participants in which they are seeking to find out more information about the scenario or the patient, for example information about symptom duration, intensity, consultation frequency etc. The information collected will help inform clinical decisions or help formulate a hypothesis. The statements may involve patient factors, social context and the gathering of patient history, their concerns, ideas and expectations. An example:

> *……the fact that he's taken time off his busy Monday morning schedule to come to the surgery again suggests that perhaps there's something more serious going on.ER12M.*

The **evaluate** code represents the clinical and social judgements verbalised by participants based on the data which is not a diagnosis. These verbalised judgements may relate to the symptoms described in the scenarios, patient characteristics and/or their social context which helps formulate clinical decisions. An example:

> *Weight loss, you know, this is a Red Flag really with any (.) symptoms so again that would give you sort of, quite a high index of suspicion.NY28M.*

The **examination/management** code captures participants voicing their thoughts on the examination process and what that might entail and also on the management or treatment plans and the relevant tests and processes that are dealt with within primary care. The examination/management code has a broad remit. It ranges from the examination and its findings which are important for deciding what course of action is needed, blood tests and other relevant tests to smoking advice or prescribing inhalers. It is NOT related to a specific request for a chest x-ray (CXR) or ultrasound as that is to be coded under diagnostic. An example:

> *So, you'd move on to, well basically whatever he tells you you're going to examine his chest anyway, so, you listen to the chest and you're looking for signs of, initially lung cancer, but there may be signs of COPD or, or some other condition.ER14M.*

The **diagnostics** code captures participants voicing an intention to arrange a diagnostic test that the GPs themselves could order or access. In practice this only related to CXRs and ultrasounds. The decision was taken to separate the CXR and create a separate code from the management code to allow for a detailed understanding to the extent of chest x-ray requests amongst participants. An example:

> *Ok right, so you are probably going to arrange a chest x-ray urgently and then consult your medical defence union for why you didn't do anything a year earlier. Yeah but that's a chap who's at very high risk of having lung cancer.ER01M.*

The **referral** code represents participants verbalising a referral to a hospital specialist, most commonly a chest/respiratory physician, ENT consultant or cardiologist. These are often described as two week waits or urgent referrals into secondary care. An example:

> *If there's a concern that he may have been exposed to asbestos, and then he's going to need referral to a respiratory physician for an assessment and better imaging than GPs can manage to organise.HU22M.*

The **diagnosis** code captures participant statements that either pinpoint a specific diagnosis they reached based on the scenario or their differential diagnosis. An example:

> *Although she hasn't smoked she will have passively smoked quite a lot because she goes to the pub, and she likes a drink, so she's got some risk factors, not only for lung cancer but oesophageal cancer as well.HU03M*

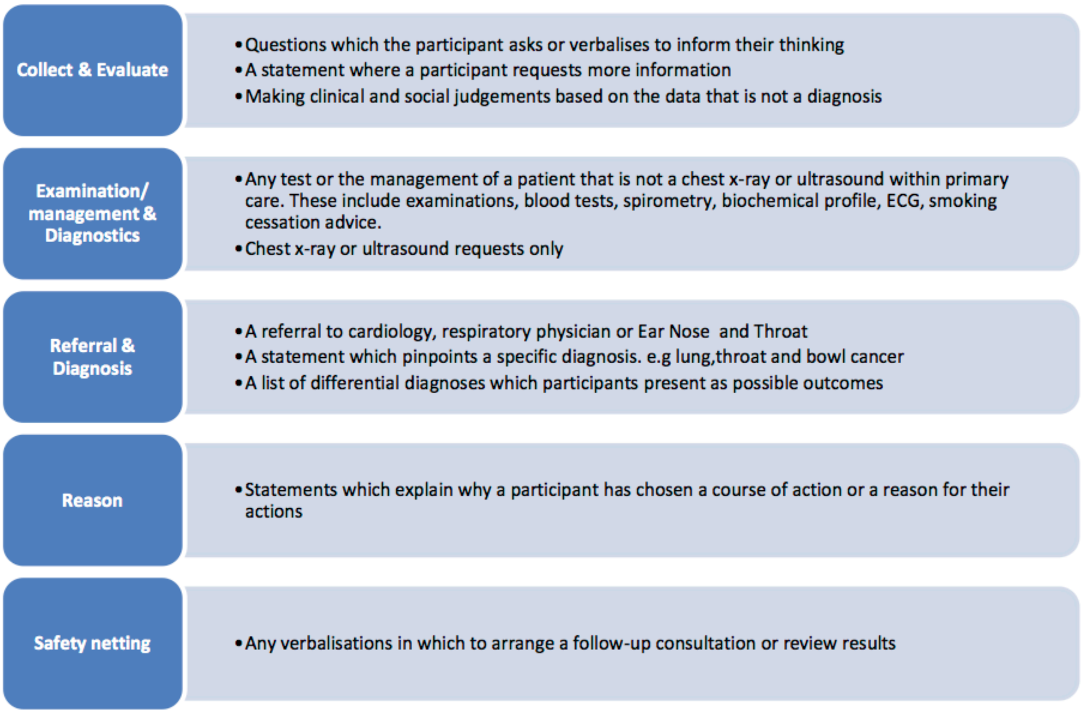
The code for **reason** considers why participants have chosen a particular course of action or reasons for their actions. The code aims to capture and understand the rationale of participant decision making. An example:

> *I might do some blood tests, full blood count, biochemical profile, because salts can be affected in lung cancer, that sort of thing.HU04M.*

Finally, the **safety-netting** code captures participant utterances that describe some form of follow-up consultation or call-back to the surgery to either discuss next steps or feedback from results. The literature describes safety-netting as a diagnostic strategy that deals with clinical situations where a diagnosis is uncertain or a differential diagnosis which includes serious illness or has an increased risk to the patient (Almond et al., 2009). The term ‘safety-netting’ was first introduced to general practice by Roger Neighbour (2004) who considered it a core component of a GP consultation. Within the context of this thesis it is important to clarify the term safety-netting and how it has been applied. It has been coded for verbalisations involving a follow-up appointment or a form recall or back up process. A decision was taken not to include verbalised referrals and diagnostic processes which may be viewed as diagnostic safety-netting as these have been coded under referral and diagnostics. An example:

> *I would probably end up doing bloods in the surgery either then or bring her back say, bring her back really quickly to do that and make some kind of follow-up appointment to make sure it was getting followed up.HU23F.*

Figure 7.1 Over-view of the coding framework



Collect & Evaluate	• Questions which the participant asks or verbalises to inform their thinking • A statement where a participant requests more information • Making clinical and social judgements based on the data that is not a diagnosis
Examination/ management & Diagnostics	• Any test or the management of a patient that is not a chest x-ray or ultrasound within primary care. These include examinations, blood tests, spirometry, biochemical profile, ECG, smoking cessation advice. • Chest x-ray or ultrasound requests only
Referral & Diagnosis	• A referral to cardiology, respiratory physician or Ear Nose and Throat • A statement which pinpoints a specific diagnosis. e.g lung,throat and bowl cancer • A list of differential diagnoses which participants present as possible outcomes
Reason	• Statements which explain why a participant has chosen a course of action or a reason for their actions
Safety netting	• Any verbalisations in which to arrange a follow-up consultation or review results

Figure 7.1 is a visualisation of the coding framework. The findings from the think aloud analyses are presented within a number of tables. Codes have been grouped together for some tables in recognition of how thoughts from the working memory are verbalised and how participants gathered and processed information within a patient consultation.

The aim of the analysis process was to establish a weighting against prominent terms that emerge from the coding framework. Whilst NVIVO software was used for the management of the think aloud data set it was also used for the detailed counting of the different terms verbalised by participants to establish a weighting which was implemented solely by the student. Because of this limitation the analysis process was at risk of human error and a level of caution should be taken in assessing the final numbers presented in the tables.

The tables are designed to represent certain characteristics of participants and their geographic location. It should be recognised that applying many layers of differing participant characteristics and practice characteristics creates immense complexity within the analysis phase which may reduce the credibility of some findings. The rationale for splitting some tables between experience and geographic locations was 1) to examine if experience was a factor in clinical decision-making and 2) if there were differences in clinical decision making between participants from urban and semi-rural/rural areas. This is due to urban areas often having higher lung cancer incidence due to smoking prevalence and the possible differences in access to diagnostics compared to rural GPs who may have less easy access to CXR. The aim is to compare and contrast findings from the urban location of Hull and semi-rural and rural locations within the East Riding of Yorkshire, North Lincolnshire and North Yorkshire. These have been classified as 'semi-rural' in the tables.

It is important to clarify some terms which highlight blood tests and are used in the tables across the four scenarios. The term 'request a blood test' was in response to participants not making it clear in their verbalisations. This term also combines a bio-chemical profile. The decision was taken to separate what was verbalised as a full blood count because it was clearly stated as a specific type of blood test by a number of participants. The other specific blood test verbalised which became a separated code was a Pro-BNP, again, this was clearly stated by some participants and is a very specific test for investigating heart failure and implies a very specific direction of thinking.

7.4 Findings from scenario one

The findings from table 7.1 indicate how terms that underpin the collect code are contextualised as statements in which participants ask or verbalise questions that will help inform their thinking and their decision processes. With regards to the evaluate code this represents statements that have been made that are clinical judgements based on the data which is not a diagnosis.

7.4.1 Collect and evaluate outcomes from scenario one

Table 7.1: Outcomes from analysis for the collect and evaluate code for scenario one.

Collect and evaluate	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Self-employed and lack of time	69%	57%	**61%**
Relevance of haemoptysis	62%	57%	**58%**
Patient history (includes smoking, duration of symptoms)	62%	48%	**53%**
Relevance of time of consultation (Monday morning)	62%	43%	**50%**
Relevance of cough	54%	48%	**50%**
Non-attender/infrequent attender	46%	43%	**44%**
Relevance of smoking	38%	43%	**42%**
Reference to gender	54%	30%	**39%**
Discuss patient concerns, ideas and expectations	23%	39%	**33%**
Reference to age	15%	39%	**31%**
Family history	8%	17%	**14%**

The different terms that emerged from the analysis process help us understand what participants viewed as important information. The findings show the majority of participants viewed patient factors such as being self-employed, timing of the presentation which increased their suspicion or what was verbalised as ‘red flags’. One hypothesis for increasing their suspicion was the unusual occurrence of having self-employed middle aged males present to their practice which was viewed by some participants as a rare occurrence.

> *He is self-employed and he is the breadwinner. So you’re immediately thinking, (...) when I see someone who is self-employed, for them to give up time to come into the surgery is significant, so alarm bells are ringing before we even get any further down on the list.ER01M.*

The second most commonly collected piece of information voiced by participants was the patient history with just over half (53%); this was closely followed by a Monday morning emergency appointment which was verbalised by half of all participants (50%).

> *……the fact that he's taken time off his busy Monday morning schedule to come to the surgery again suggests that perhaps there's, something more serious going on.ER12M.*

The other important factor that informed participant thinking was the infrequency or non-attendance to general practice (44%).

> *Okay, so somebody who's coming, wasn't attending for six years so, and such a busy man so there's something definitely wrong with him otherwise he wouldn't, he wouldn't have come, so something either troubling him or he's worried and he does have significant symptoms.HU11F.*

Other factors that informed the thinking by participants involved patient characteristics; these included age (31%) and gender (39%).

The main findings within evaluate are associated with symptoms which included haemoptysis (58%), cough (50%) and smoking (42%). Twenty one participants verbalised various clinical evaluations aligned to haemoptysis which was described as a red flag, high risk or worrying sign amongst a proportion of participants.

> *Well he hasn't actually come with the cough, directly, or whether he had lots of things that he was coming to do with, but obviously he's got that cough and haemoptysis which are what we call Red Flags, in general practice. NY31F.*

7.4.2 Diagnostics and examination/management outcomes of scenario one

Table 7.2: Diagnostics and examination/management outcomes of scenario one

Diagnostic and examination / management	Semi-Rural n=13	Urban n=23	Total n=36
Request a chest x-ray	85%	100%	**94%**
Examination	77%	65%	**69%**
Request blood test (includes bio-chemical profile)	8%	39%	**28%**
Discuss smoking cessation	8%	30%	**22%**
Prescribe antibiotics	15%	17%	**17%**
Blood pressure checked	0	22%	**14%**
Full blood count	0	13%	**8%**
Spirometry	0	13%	**8%**

The different diagnostics and examination/management decisions verbalised by participants are summarised in Table 7.2. The data show that the decision to request a CXR was verbalised by the majority of participants (94%). A range of factors prompted a CXR request including the patient describing minor haemoptysis, persistent cough and the patient being an infrequent attender and a long term smoker.

> *Basically I'm leaping straight to a chest x-ray here. [laughs] Even though he's only just come on a Monday morning because he's got haemoptysis and be, and because he's got a cough that's been persistent for a number of weeks maybe and because he's a smoker and because he doesn't take care of himself because he's fifty seven and he'll probably ignore his symptoms to get on with earning money for his family. So I'd want, I definitely would do a chest x-ray.HU20F.*

In addition, approximately two thirds of participants (69%) clearly stated that they would examine the patient and approximately a third (28%) would request a blood test.

> *Well, (.) for the persistent cough he could have a chest infection, so I would obviously take a detailed history, listen to his chest, examine him and then, and then decide what to do then.HU10M.*

> *There would be a timetable there so they could go and get it done and also ask him to organise some blood tests, I would like to see him back as soon as he gets the x-ray done. HU17M.*

> *Basically, agreeing a management plan with him which will include things like possibly because he has not been for six years, so, worth doing some kind of routine blood test in relation to his symptoms and checking off if he has got fever or anything by doing some tests you know checking his temperature and stuff examining him and obviously sending him for a chest x-ray.HU02M*

Table 7.2.1: Diagnostic and examination/management outcomes factoring in experience for scenario one

Diagnostic and examination / management	**Experience >10 years n=23**	**Experience <10 years n =13**	**Total n=36**
Request a chest x-ray	96%	92%	**94%**
Examination	70%	69%	**69%**
Request blood test (includes bio-chemical profile)	30%	23%	**28%**

The data shows twenty two (96%) participants with over 10 years' experience verbalising a request for a CXR compared to twelve (92%) with less than 10 years' experience.

7.4.3 Referral and diagnosis outcomes from scenario one

Table 7.3: Referral and diagnosis outcomes from scenario one

Referral / Diagnosis	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Lung cancer diagnosis	54%	43%	**47%**
Referral to respiratory physician	38%	35%	**36%**
COPD diagnosis	23%	13%	**17%**
Tuberculosis	0	13%	**8%**
Pulmonary embolism	0	9%	**6%**
Referral to stop smoking service	0	4%	**3%**
Sinus disease	0	4%	**3%**
Bowel cancer	8%	0	**3%**
Deep Vein Thrombosis (DVT)	0	4%	**3%**
Mallory Weiss Tear	0	4%	**3%**

Lung cancer was clearly stated as the most likely diagnosis by the majority of participants (47%) with other differential diagnoses also being verbalised. A small minority of participants suggested Chronic Obstructive Pulmonary Disease (COPD) (17%) with other diagnoses including Tuberculosis (8%), Pulmonary Emboli (3%) and bowel cancer (3%), sinus disease (3%) and Mallory Weiss Tear (3%).

> *Cough, (.) little bit of a blood but he's not wanting to upset people, he's sort of burying his head in the sand, typical male ostrich, fifty seven year old in that respect, and, I mean you, you know, clearly you're immediately thinking he's, he's in an at risk group but there's nothing immediate in, in there that says well this is, this is, you know, definitely bleak bad news but CA lung, is right up there with, with all the other differentials, COPD and smoking.NL26M.*

The findings for referral reveal approximately a third of participants (36%) voicing a referral to a chest or respiratory physician whilst only one voiced a referral to a stop smoking service.

> *Well, this chap I think, because he has a, because of that history I think what I would do is go straight for a two week wait referral, because I think getting a chest x-ray is not going to be enough, even if he, even if the chest x-ray doesn't show anything about history of haemoptysis he's still going to need two week wait referral [...]. I think, irrespective of any features of examination or any other consideration, I think that history for me is a straight two week wait referral to respiratory.ER12M.*

Table 7.3.1: Referral and diagnosis outcomes factoring in experience for scenario one

Diagnosis and referral	**Experience >10 years n=23**	**Experience <10 years n =13**	**Total n=36**
Lung cancer	52%	38%	**47%**
Respiratory physician	35%	38%	**36%**

The data show twelve (52%) participants with over 10 years' experience voicing a lung cancer diagnosis compared to five (38%) participants with less than 10 years' experience. Within referral eight participants with over 10 years' experience (35%) verbalise a referral to a respiratory physician compared to five (38%) participants with less than 10 years' experience.

7.4.4 Reason for a course of action from scenario one

Table 7.4: Reason for a course of action from scenario one

Reason	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Related directly to cough	85%	96%	**92%**
Related directly to haemoptysis	100%	83%	**89%**
Ruling out of sinister pathology or malignancy	23%	22%	**11%**

The findings reveal the main reasons for action were associated with cough (92%) and haemoptysis (89%). The data also reveals that participants gave more than one reason or a combination of reasons for a course of action.

7.4.5 Safety-netting outcomes of scenario one

Table 7.5: Safety-netting outcomes of scenario one

Safety-netting	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Total number of participants who verbalised some form of safety-netting	31%	61%	**50%**
Specific terms verbalised			
In-house follow-up mechanism (ring him up, secretary follow-up, message / screen prompt)	8%	22%	**17%**
An explicit request for patient to return for results (chest x-ray, bloods other tests)	15%	13%	**14%**
An explicit request for patients to return after a specific time period	0	13%	**8%**
A follow up appointment which is vague	8%	4%	**6%**
A patient to return / follow-up which is promissory in nature	0	4%	**3%**
Participant verbalises the importance of attending a c x-ray appointment	0	4%	**3%**

Half of all participants (50%) verbalised some form of safety-netting for scenario one. It is thought more safety-netting terms may have been verbalised and had greater weighting amongst participants given the 'barn door' nature of the scenario.

Six participants (17%) voiced an in-house mechanism for safety-netting which involved a direct phone call to the individual, a secretarial follow-up or a computer automated prompt or message requesting a follow-up. The second most common term verbalised by participants (14%) was an explicit follow-up after the results of a CXR or other tests.

> *He wants this problem sorting out as quick as possible so he came to the hospital for a chest x-ray, say we will phone you when we get the results, give me your mobile number and I will ring you as soon as I get the results because we need to make sure there isn't something serious going on, I can understand you being obviously worried about it, it's a good job that you came to the doctor, okay? HU03M.*

Other safety-netting utterances describe a specific time frame (8%), often relating to the time it took to get results of CXRs and their reports back. These varied between five and ten working days depending on where participants were based and access to the relevant services. A small number of participants (6%) verbalised a follow-up but it was sometimes not explicit and interpreted as unclear by the student. Dealing with this lack of clarity poses challenges within the analysis process. Within the data there were some vague verbalisations by participants regarding safety-netting. These were requests for follow up appointments or the importance of attending an x-ray appointment which was interpreted as promissory in nature by the student.

7.4.6 Summary interpretation of scenario one

This summary relates to scenario one (full clinical scenario on p. 174). One of the main cognitive activities verbalised by participants was the request for a CXR. Thirty four participants said they would request a CXR from a total of thirty six participants.

The two participants who did not voice a CXR both belonged to the same teaching practice. Both participants verbalised contrasting reasons for not requesting a CXR; one participant voiced a direct two week referral due to the history of presenting symptoms.

> *Well, well this chap I think, because he has a, because of that history I think what I would do is go straight for a two week wait referral because I think getting a chest x-ray is, is, is not going to be enough.ER12M.*

The other participant verbalised the potential treatment of a chest infection with antibiotics depending on examination findings with a potential delay of a week.

> *I've got to say that most of the time this chap would probably just have a chest infection and it probably would be either treating it either symptomatically or with antibiotics if there were clinical signs……………………………………………like I say the, the long, the thirty plus pack year history and, and him being quite a stoical gentleman, likely to present late if he was going to present with it, that's it, I would have thought, playing the odds, whether you'd go for infection first, you'd be delaying a week I suppose, any further investigation and referral but playing it a little bit.ER13M.*

The inferences that could be drawn from these different approaches need to take into consideration whether participants were acting conscientiously or cautiously, with one participant considering the history and complying with current guidelines with an immediate referral and the other viewing the probability of a chest infection and factoring in patient characteristics and the social context and treating it appropriately but cautiously.

Comparing the findings between the different codes highlighted a number of patterns. One noteworthy finding highlighted the number of participants requesting a CXR compared with participants verbalising a lung cancer diagnosis. It could be argued that if participants mention lung cancer there would be an implicit suggestion they would refer the patient, however, the findings seem to conflict with this theory as only seventeen (47%) participants verbalised lung cancer compared to thirty four (94%) who requested a CXR. It is perhaps surprising that more participants did not verbalise a lung cancer diagnosis due to the scenario's 'barn door' description of presenting symptoms and patient factors that were related to lung cancer. The NICE guidance for lung cancer (2011) highlights patients who present with symptoms such as haemoptysis, cough, chest/shoulder pain; dyspnoea, weight-loss, chest signs and hoarseness could be at risk of lung cancer and suggest a CXR or a two week referral. One could hypothesise that while participants may not have verbalised lung cancer explicitly it may not mean they weren't thinking about lung cancer, and that this non-verbalised thinking explains why the majority of the participants requested a CXR. This possibility that the participants failed to fully verbalise their thoughts may be viewed as a limitation with the think aloud method.

The findings revealed a low number of participants verbalising a referral to a respiratory physician (36%). This number was surprising given the described symptoms within the scenario and the current guidelines for a two week referral being haemoptysis in smokers and ex-smokers over the ages of 40 years. By way of contrast, the findings did show the majority of participants requesting a CXR which suggests participants were waiting for results before referring to secondary care. The inferences that could be drawn from this suggest that participants were either applying a cautionary gatekeeper role or diagnostic safety-netting.

The main reason for participants to take a course of action was related to the symptoms presented in the clinical case scenario. The majority of participants voiced cough (92%) and haemoptysis (89%) as the main reason for action. Dealing with the vagueness within a participant's verbalisations proved difficult which resulted in a strategy to maintain transparency with all verbalised terms, however, it also highlights a limitation with the think aloud method. As highlighted by van Someren et al. (1994), there are a number of areas open for criticism within think aloud involving incompleteness of verbalisations due to synchronisation, memory errors or due to disturbance in the cognitive process.

The data suggest participants often gave a combination of reasons for a course of action. The findings suggest the majority of participants viewed this clinical situation as needing further action.

7.5 Findings from scenario two

7.5.1 Collect and evaluate outcomes of scenario two

Table 7.6: Collect and evaluate outcomes of scenario two

Collect and evaluate	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Progression / exacerbation of COPD	69%	70%	**69%**
Relevance to breathlessness	69%	57%	**61%**
Patient history (includes review notes, smoking history and duration of symptoms)	62%	52%	**56%**
Information about her breathlessness (why it's getting worse)	62%	52%	**56%**
Relevance to COPD	54%	39%	**44%**
Review medication / inhalers	31%	35%	**33%**
Relevance to weight	62%	13%	**31%**
Relevance to smoking	8%	26%	**19%**
Relevance to inactivity / lack of exercise	23%	9%	**14%**
Information on mental health	8%	9%	**8%**
Explore patient concerns, expectations and ideas	8%	9%	**8%**

One of the most common terms verbalised by participants involved collecting information to do with the progression or exacerbation of COPD (69%) and information relating to the patient's worsening breathlessness (56%) and a patient's history (56%).

> *So this sounds like it's happened more slowly, the first thing that springs to mind is that she's just got a worsening or exacerbation of her COPD, we need to look at her medication and whether she's using that correctly. HU23F.*

Other information that was collected was associated with the review of inhalers (33%) and the patient's weight (31%).

> *If she not using the inhalers I'd give her advice on the inhaler use and things like that.NL34F.*

> *We need to sort of bear in mind the fact that obviously she's overweight and not doing a lot of exercise, is the breathlessness linked to that in any way and do we need to do a little bit of health promotion in there as well?NY31F.*

Within the context of evaluation the analysis revealed some cognitive processes were associated to symptoms and co-morbidities. Approximately two thirds of participants (61%) mentioned breathlessness and approximately half (44%) voiced COPD.

> *It's a possibility of me thinking with the COPD getting worse is there an evidence of something like more sinister.ER16F.*

7.5.2 Diagnostics and examination/management outcomes of scenario two

Table 7.7: Diagnostics and examination/management outcomes of scenario two

Diagnostic/management	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Chest x-ray request	85%	83%	**83%**
Examination	54%	57%	**56%**
Request blood test (includes bio-chemical profile)	54%	43%	**47%**
Spirometry	38%	43%	**42%**
Pro-BNP	54%	13%	**28%**
ECG test	46%	9%	**22%**
Review inhaler management	15%	26%	**22%**
Check blood pressure	15%	22%	**19%**
Full blood count	31%	13%	**19%**
Discuss smoking cessation	8%	26%	**19%**
Prescribe antibiotics	8%	13%	**11%**

Table 7.7 shows the different clinical decisions verbalised by participants in response to clinical case scenario two. The data show that the majority of participants said they would request a CXR (83%) and just over half of participants said they would conduct an examination (56%).

> *I will probably, again in her case really low threshold will be doing an x-ray of her chest but also some blood test to check for anaemia and that sort of thing because that causes breathlessness.HU02M.*

The findings also show just under half of participants requested a blood test (47%) closely followed by spirometry (42%) and approximately a third of participants requested a Pro-BNP (28%).

> *As a first port of call we do some blood tests, so really checking full blood count. She, make thyroid, sugar, check inflammatory markers if you're worried about any underlying malignancies and things like that and an ECG as well with this lady because she is breathless and people in their sixties can have silent infarcts. ER05F.*

Table 7.7.1: Diagnostic and examination/management outcomes factoring experience for scenario two

Diagnostic and examination / management	**Experience >10 years n=23**	**Experience <10 years n=13**	**Total n=36**
Chest x-ray request	83%	85%	**83%**
Examination	52%	62%	**56%**
Blood test	48%	46%	**47%**
Spirometry	43%	38%	42%

The data shows similar percentages of participants requested a CXR. Management of the patient which involved an examination was verbalised by twelve (52%) participants with over 10 years' experience compared to eight (62%) participants with less than 10 years' experience. This was closely followed by a blood test which was verbalised by eleven (48%) participants with more than 10 years' experience and six (46%) participants with less than 10 years' experience.

7.5.3 Referral and diagnosis outcomes from scenario two

Table 7.8: Referral and diagnosis outcomes from scenario two

Referral and Diagnosis	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Cardiac / heart failure diagnosis	54%	52%	**53%**
Exacerbation / worsening of COPD	31%	52%	**44%**
Diagnosis of anaemia	46%	39%	**42%**
Lung cancer diagnosis	31%	39%	**36%**
Ischemic heart disease diagnosis	15%	4%	**8%**
Referral to respiratory physician	0	4%	**3%**
Referral to stop smoking	0	4%	**3%**
Referral to weight management	0	4%	**3%**
Interstitial lung disease diagnosis	0	4%	**3%**
Diabetes	8%	0	**3%**

The analysis revealed that just over half of all participants (53%) mentioned either a cardiac or heart failure diagnosis compared to only a third of participants (36%) who verbalised a lung cancer diagnosis for scenario two. There were a number of participants who had mixed views on which clinical direction to take with some also voicing more than one specific clinical diagnosis or management pathway. The other noticeable diagnoses voiced by participants were the exacerbation or deterioration of COPD (44%) and anaemia (42%).

> *Well I think with this lady, my, (.) I would be less focussed on possibility of lung cancer that just thinking more about undertaking initial assessment in order to evaluate the breathlessness, so again examination, blood tests, chest x-ray, certainly this could be her COPD getting worse this could be her beginning to develop some degree of heart failure.NY32F.*

Only one participant verbalised that they would refer to a specialist such as a respiratory physician; however, the same participant also verbalised a potential cardiac direction. A small minority of participants verbalised referrals to a smoking cessation service or to a weight management service. The inferences that could be made from the data in table 7.8 suggest the majority of participants would initially retain and manage patients with similar symptoms and characteristics within primary care even though a large majority of participants would arrange a CXR. Thirteen (36%) participants did verbalise a diagnosis of lung cancer which would almost certainly trigger a referral if diagnosed via a CXR.

Table 7.8.1 Referral and diagnosis outcomes factoring in experience for scenario two

Referral and Diagnosis	**Experience >10 years n=23**	**Experience <10 years n=13**	**Total n=36**
Cardiac / heart failure	52%	54%	**53%**
Worsening of COPD	48%	38%	**44%**
Anaemia	43%	38%	**42%**
Lung cancer diagnosis	30%	46%	**36%**

Table 7.8.1 shows there were similar percentages between participants voicing a cardiac/heart failure diagnosis. The data show eleven (48%) participants with more than 10 years' experience verbalising a worsening of COPD compared with five (38%) participants with less than 10 years' experience. Similar percentages of participants verbalised anaemia. In contrast, lung cancer diagnosis was voiced by seven (30%) participants with more than 10 years' experience compared to six (46%) participants with less than 10 years' experience.

7.5.4 Reason for a course of action from scenario two

Table 7.9: Reason for a course of action from scenario two

Reason	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Related directly to breathlessness	77%	65%	**69%**
Related directly to COPD	77%	61%	**67%**
Related directly to heart failure	62%	43%	**50%**
Related to smoking	23%	26%	**25%**

Table 7.9 shows participants' reasons for a course of action within scenario two. The majority of participants described worsening of breathlessness as the main reason for action (69%) closely followed by the co-morbidity described within the scenario which is moderate COPD (67%). Other reasons for action relate to heart failure (50%) and the latter involving smoking (25%). The data also revealed that participants often gave a combination of reasons for a course of action.

> *She will need a full assessment in terms of her cardiac and respiratory things, and, and from ten minutes I'm may see, I would do, because of her, breathlessness, of course if we can find it's not the cardiac, do blood pressure and any other medications.NL36M.*

7.5.5 Safety-netting outcomes of scenario two

Table 7.10: Safety-netting outcomes of scenario two

Safety-netting	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Total number of participants who verbalised some form of safety-netting	62%	35%	**50%**
Specific terms verbalised			
A request for patient to return after results had returned (chest x-ray, bloods other tests)	31%	13%	**17%**
An explicit request for patients to return after a specific time period	23%	4%	**14%**
A request for a follow up / bring her back which is vague and implicit	8%	9%	**8%**
In-house follow-up mechanism (ring her up, secretary follow-up, message / screen prompt)	0	9%	**6%**

Just under half of all participants (44%) verbalised some form of safety-netting for scenario two. The most common verbalisation by participants was a return appointment to review results (19%).

> *If it was a more precipitous decline in her exercise tolerance she'd probably get a chest x-ray, yeah, and a full blood count and a thyroid checking and her Us and Es and her calcium and then she'd come back and see me and see what they all were.NY30M.*

Four participants (11%) gave an explicit time period for a return or follow-up appointment. The time frame was often verbalised between one and two weeks and relating to either antibiotic treatment or the time it took to receive the results back from tests.

> *If it's infected I would definitely want to treat her for the infective, bring her back, either way, whether she's better or not better to see how she's going and, and then assess from there and I mean if she's not better, even in about, I'd probably bring her back in two weeks and then if she's still not better despite what I put in then it's a possibility of me thinking with the COPD getting worse is there an evidence of something like more sinister, so that will be two weeks I'll bring her in.ER16F.*

The other types of safety-netting verbalised was more implicit and vague in nature involving a follow-up appointment or bringing her back into the surgery (8%). This was closely followed by a description of ringing her up or giving her a buzz back which has been contextualised within the in-house GP practice system (6%).

7.5.6 Summary interpretation of scenario two

This summary relates to scenario two (full clinical scenario on p. 175). In summary, the analysis revealed progression or exacerbation of COPD (69%), worsening breathlessness (56%) and obtaining information via a patient's history (56%) was the main information collected by participants. The prominent terms verbalised within evaluation were associated with breathlessness (61%) and COPD (44%) with many participants viewing this scenario as cardiac related rather than respiratory. The majority of participants said they would order a CXR (83%) and just over half of participants indicated intent to conduct an examination (56%). The main diagnosis verbalised by participants (53%) was heart failure and approximately a third of participants verbalised lung cancer (36%). There was some uncertainty from participants on which was the most appropriate clinical direction to take with many voicing more than one possible clinical diagnosis and pathway. These included heart failure, lung cancer or an exacerbation or deterioration of COPD. The inferences that could be drawn from the data suggest that for such patients it can be difficult for GPs to decide which pathway to access. It was noteworthy that only one participant voiced the decision to refer to a respiratory physician within scenario two with data suggesting the majority of participants preferred initially to manage patients within primary care and wait for the results before making a decision to refer to secondary care. The findings also suggest that it is common practice to wait for the CXR results before referring directly to secondary care. The inferences that can be drawn from this suggest participants were adopting their perceived gatekeeper role or safety-netting. Fewer than half of all participants (44%) voiced some type of safety-netting with the dominant term being the request for a patient to return for their results (19%).

Finally, further analysis also revealed the collect and reason code had some commonality. Both sets of codes had terms that were associated with symptoms implying that participants were focusing and acting upon the salient features.

7.6 Findings from scenario three

7.6.1 Collect and evaluate of scenario three

Table 7.11: Collect and evaluate of scenario three

Collect and evaluate	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Relevance to weight loss	23%	70%	**61%**
Information on chest pain	85%	48%	**61%**
Additional information on asbestos exposure	62%	52%	**56%**
Quantify his alcohol intake	38%	43%	42%
Patient history (over the last 12 months, smoking history)	38%	35%	**36%**
Unexplained weight loss	46%	30%	**36%**
Relevance to chest pain	54%	26%	**36%**
Relevance to breathlessness	15%	30%	**25%**
Dietary information	8%	17%	**14%**
Mental health / wellbeing / isolation	0	17%	**11%**
Discuss patient concerns and ideas	0	13%	**8%**
Assessment of risk because of age	0	13%	**8%**

The findings in Table 7.11 show what information was collected and evaluated by participants. The main information collected involved chest pain (61%) and asbestos exposure (56%). Within evaluate the most common term voiced by participants was weight loss (61%), followed by chest pain (36%) and finally breathlessness (25%).

> *So I'd ask questions about the chest pain, I'd want to know more about it. If it's a chest pain that comes on with exertion or activity, that's relieved by rest, that would tend to indicate more of a heart cause of it. If it's a, a chronic, if it's a constant nagging chest pain, that, that would, concern whether some kind of local neoplastic process going on, he's actually got some kind of pathology that's, that, that's caused, so I'd want to know the location of the pain, the severity of the pain, if it's mild, moderate or severe, if it's just a niggle or, or whether it's a severe intractable pain, that's getting worse and worse and worse.NY29M.*

Approximately half of all participants (42%) verbalised the need to quantify and investigate alcohol further and a third of participants described taking a patient history (36%). The same number of participants also voiced unexplained weight loss (36%).

> *Drinks quite a lot of alcohol, I, I'd want to quantify that a bit, patients often might drop that, I drink quite a bit and we would want to just clarify the number there, so what do you mean by a little bit or quite a lot? NY21M.*

> *Weight loss, you know, this is a Red Flag really with any (.) symptoms so again that would give you sort of, quite a high index of suspicion. NY28M.*

Further analysis of the data from table 7.11 shows similarities between urban and semi-rural when collecting information on chest pain, although when factoring in the differences in sample size between urban and semi-rural participants those who verbalised chest pain from a semi-rural location are in much greater proportion compared to those from urban locations.

Table 7.11.1 Collect and evaluate outcomes factoring in experience for scenario three

Collect and evaluate	**Experience >10 years n=23**	**Experience <10 years n =13**	**Total n=36**
Weight loss (evaluate)	61%	62%	**61%**
Chest pain (collect)	61%	62%	**61%**
Asbestos exposure (collect)	61%	46%	**56%**

The findings show there were similar percentages between the different years' of experience and collecting information on chest pain and evaluating symptoms involving weight loss.

7.6.2 Diagnostics and examination/management outcomes for scenario three

Table 7.12: Diagnostics and examination/management outcomes for scenario three

Diagnostic/management	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Chest x-ray request	100%	83%	**89%**
Request blood test (includes bio-chemical profile)	69%	78%	**75%**
Examination	46%	48%	**47%**
Full blood count	31%	35%	33%
ECG test	23%	13%	**17%**
Liver Function Test (LFT)	15%	13%	**14%**
Weighed him	8%	9%	**8%**
Pro BNP	8%	4%	**6%**
Spirometry	15%	0	**6%**
Blood pressure checked	0	9%	**6%**
Request ultrasound	8%	0	**3%**
Breathlessness score	8%	0	**3%**

The findings from Table 7.12 show the majority of participants (89%) requested a chest x-ray in response to clinical scenario three.

> *First thing I'd want to do is to get an urgent chest x-ray for him. And, so that was what I would do, but as well as that I'd want to, talk to him about that and discuss why I'd have concerns and just set the scene for him having that chest x-ray. HU24F.*

A large majority of participants also requested a blood test (75%) and almost half of participants (47%) verbalised the decision to examine the patient.

> *I will also do blood tests in his case because he, if he's not eating well, he's losing weight then it, it, I think it warrants blood tests, checking his thyroid function, making sure he's not diabetic, making sure he's not anaemic, making, look at his liver and his kidneys.HU04M.*

A third of participants (33%) requested a full blood count while only a small number requested an ECG (17%), liver function test (14%) or voiced that they would weigh him (8%).

Table 7.12.1: Diagnostics and examination/management outcomes factoring in experience for scenario three

Diagnostic and examination / management	**Experience >10 years n=23**	**Experience <10 years n=13**	**Total n=36**
Chest x-ray	87%	92%	**89%**
Blood test	65%	92%	**75%**
Examination	35%	69%	**47%**

The findings in table 7.12.1 show some differences in the examination and blood tests when factoring in experience. The number counted for blood test does not include a full blood count and Pro-BNP as the decision was to focus on the main diagnostics and examination/management terms verbalised in this scenario. The data suggest participants who had more than 10 years' experience were less likely to verbalise an examination compared to those with less than 10 years' experience. The data also suggest participants with less than 10 years' experience were more likely to verbalise a request for a blood test compared to those with more than 10 years' experience.

7.6.3 Referral and diagnosis outcomes for scenario three

Table 7.13: Referral and diagnosis outcomes for scenario three

Referral and Diagnosis	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Lung cancer diagnosis	54%	22%	**33%**
Lung disease/mesothelioma diagnosis	31%	26%	**28%**
Referral to respiratory physician	15%	35%	**28%**
Ischemic heart disease / Angina	15%	22%	**19%**
Referral to chest pain clinic / cardiology	15%	4%	**8%**
Gastric cancer diagnosis	8%	9%	**8%**
Heart failure diagnosis	8%	4%	**6%**
Pancreatic cancer diagnosis	8%	4%	**6%**
Liver cancer / liver disease	8%	4%	**6%**
Bowel cancer diagnosis	8%	4%	**6%**
Pulmonary emboli diagnosis	0	4%	**3%**
Throat cancer diagnosis	0	4%	**3%**
Thyroid disease	8%	0	**3%**

The most common diagnosis voiced by participants was lung cancer (33%) closely followed by lung disease and mesothelioma (28%). Other diagnoses verbalised were ischaemic heart disease and angina (19%) and heart failure (6%). Other cancers and diseases were also described; these included pancreatic cancer (6%), gastric cancer (8%), bowel cancer (6%), throat cancer (3%) and liver disease (6%). The inferences that could be drawn from the data suggest that the majority of participants thought this was something serious and it emphasises the complexity in diagnosing lung cancer due to the potential number of alternative diagnoses that may also need to be considered.

> *He could have lung cancer, all the signs are there, I'll have to go along with the fact that his weight loss is unexplained. I can't be too clever and start saying oh it's because he hardly eats and he walks a lot, I may think that, I may even tell him that but I can't assume that. HU04M.*

> *A retired dock hand so people who have worked on the dock I always start to think about whether they have got some sort of occupational medical problem which might include asbestos exposure and therefore either means mesothelioma or an increased risk of lung cancer that goes with that. ER01M.*

Approximately a third of participants (28%) vocalised their preference to refer to a respiratory physician with a small minority verbalising a referral to either a chest pain clinic or to cardiology (8%).

> *It's likely that he's going to need another up to date chest x-ray, if there's a concern that he may have been exposed to asbestos, and then he's going to need referral to a respiratory physician for an assessment and better imaging than GPs can manage to organise.HU22M.*

There were some participants who were undecided regarding the appropriate referral pathway until results of tests and CXRs had returned. There are differences in the weighting between the urban and semi-rural factors for verbalising a diagnosis of lung cancer within scenario three. The data show approximately a fifth (22%) of urban participants verbalising lung cancer in comparison to just over half (54%) from a semi-rural practice.

7.6.4 Reason for a course of action from scenario three

Table 7.14: Reason for a course of action from scenario three

Reason	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Related to breathlessness	54%	57%	**56%**
Related to weight loss	62%	52%	**56%**
Related to chest pain	46%	52%	**50%**
Related to asbestos exposure	62%	39%	**47%**
Related to being an ex-smoking	23%	13%	**17%**
Related to alcohol	8%	22%	**17%**
Related to diet	0	13%	**8%**
Related to age	8%	4%	**6%**

The findings in table 7.14 show the majority of participants described symptoms of breathlessness (56%) and weight loss (56%) as the main reason for action. This was closely followed by chest pain (50%) and asbestos exposure (47%). Other reasons for action involve smoking (17%) and alcohol (17%). It was noticeable that the patient factor relating to being an ex-smoker had a low verbal count. The inferences that could be drawn from this suggest some participants' threshold towards ex-smokers may change over a period of time or participants are simply not aware of the patient's previous smoking history. Because of this potential change in participant threshold or the lack of awareness of previous smoking history there is an increased risk of participants missing patients who warrant a request for CXR or a referral.

> *If he was presenting with chest pain and shortness of breath and weight loss even if his chest x-ray was normal I would still refer him to see a chest physician because he's going to need better imaging, he's going to need a CT scan or even an MRI scan.HU03M.*

7.6.5 Safety-netting outcomes of scenario three

Table 7.15: Safety-netting outcomes of scenario three

Safety-netting	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Total number of participants who verbalised some form of safety-netting	38%	48%	**44%**
Specific terms verbalised			
A request for patient to return after results had returned (chest x-ray, bloods other tests)	31%	22%	**25%**
An explicit request for patients to return after a specific time period	8%	17%	**14%**
A request for a follow up / bring him back which is vague and implicit	0	4%	**3%**
In-house follow-up mechanism (ring her up, secretary follow-up, message / screen prompt)	0	4%	**3%**

A total of sixteen people (44%) verbalised safety-netting with fewer than a third of participants (25%) voicing an explicit request for a patient to return for the results.

> *I'd probably do all the things myself first like an ECG, bloods and again he's breathless as well so I'd get a chest x-ray done in him, not really clear how long ago the last one was but I'd probably want to repeat that and then once all that's back I'd bring him back to review him.NL35M.*

The second most common term voiced for safety-netting was participants requesting a patient to return after a specified time period (14%). The other area of safety-netting verbalised by one participant involved a vague open-ended suggestion for a follow-up to discuss findings from relevant tests while another participant described how she would send herself a message prompt to remind her to highlight the follow-up after a two week period.

7.6.6 Summary interpretation of scenario three

This summary relates to scenario three (full clinical scenario on p. 176) A key finding was the decision to request a chest x-ray being verbalised by the majority of participants. Lung cancer was the most common diagnosis verbalised by participants followed by lung disease and mesothelioma. The analysis also revealed that approximately a third of participants vocalised a referral to a respiratory physician. Within the collected code chest pain was the most verbalised, by approximately two thirds of participants. Within evaluation the relevance to weight loss was voiced by the majority of participants followed by approximately a third of participants with chest pain. Participants' reasons for action were associated with breathlessness and weight loss. It is worth noting that there is similarity between chest pain being collected and the chest pain for a reason for action but surprisingly only a very small number voiced a referral to a chest pain clinic. A total of sixteen participants verbalised some form of safety-netting with nine voicing an explicit request for a patient to return after results.

7.7 Findings from scenario four

7.7.1 Collect and clinical evaluate outcomes for scenario four

Table 7.16: Collect and clinical evaluate outcomes for scenario four

Collect and evaluate	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Relevance of cachexia	62%	74%	**69%**
Relevance of hoarse voice	46%	70%	**61%**
Relevance of night sweats	54%	65%	**61%**
Relevance of breathlessness	38%	48%	44%
Information on hoarse voice	54%	35%	**42%**
Information on night sweats	31%	22%	**25%**
Information on breathlessness	31%	22%	**25%**
Information on depression	15%	17%	**17%**
Patient history	15%	13%	**14%**
Information on cachexia	15%	9%	**11%**
Information on alcohol	0	17%	**11%**
Information on diet	8%	4%	**6%**
Discuss patient concerns and ideas	0	4%	**3%**

The most common term voiced within evaluation was the relevance to cachexia by just over two thirds of participants (69%), this was closely followed by both hoarse voice (61%) and night sweats (61%). The majority of participants who were coded under evaluate often verbalised the symptoms in sequence as either 'red flags', 'worrying', 'alarming' and 'concerning' symptoms which usually prompted a clear clinical decision regarding management pathway.

> *Presents to me showing signs of breathlessness, having night sweats, looks cachectic and a hoarse voice. So these are all, all of those are quite worrying symptoms to a GP. So looks cachectic, something's going on underneath there. NY21M.*

> *So, her presentation actually is with breathlessness, night sweats, cachectic, hoarse voice, she is somebody I'd be extremely concerned about from the moment she came through the door.NY32F.*

The main information collected and voiced by participants was about a hoarse voice (42%). The second most common information collected was night sweats (25%) and breathlessness (25%). Other terms included depression (17%), cachexia (11%) and alcohol (11%). It is worth noting the dominance of participants voicing terms with an evaluation context. One hypothesis for this may relate to the nature of the symptoms described in scenario four which draws on participants' clinical knowledge and the dominance of red flag symptoms which generates an automatic clinical hypothesis.

> *With the hoarseness you'd want to hear what she coughs like, and, take a hoarse voice history as it were, so is it progressive? Is it intermittent? Does it fatigue through the day or does it fatigue while you're speaking? ER14M.*

> *If she's feeling rough and sweating at night whether she's, this is something which she's experiencing a degree of alcohol withdrawal which may possibly explain some of those symptoms as well.HU24F.*

7.7.2 Diagnostics and examination/management outcomes for scenario four

Table 7.17: Diagnostics and examination/management outcomes for scenario four

Diagnostic and examination management	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Chest x-ray request	100%	100%	**100%**
Request for blood test (includes bio chemical profile)	92%	78%	**83%**
Examination	54%	52%	**53%**
Request sputum sample	23%	17%	19%
Full blood count	23%	13%	**17%**
Liver function Test	23%	13%	**17%**
Advice on lifestyle	8%	22%	**17%**
Blood pressure checked	0	26%	**17%**
Cholesterol levels checked	8%	0	**3%**
PRO-BNP	8%	0	**3%**

The findings in Table 7.17 show all of the participants requested a CXR (100%) this was closely followed by a request for a blood test (83%).

> *She's got breathlessness, night sweats, cachectic and a hoarse voice, (.) so she certainly is a two week wait, I'd probably arrange a chest x-ray simultaneously and do her bloods for the, for the chest physician.NY30M.*

The findings also show just over half voiced an examination (53%) with other management decisions involving a request for sputum tests (19%) full blood count (17%) and liver function tests (17%).

> *Also I'd probably request her sputums as well, just to see if we've got any AFBs in her, in her sputum, getting that sent off to the lab just thinking about that TB, you just, you'd want to, want to rule that out because you could have your shadow on your chest x-ray.ER13M.*

> *I think one of the other ones I forget is the, drinking a lot of alcohol, so I didn't, just thinking back that would be, we'll need to do some liver function tests and so on, one of the ones that was drinking a lot of alcohol.HU10M.*

7.7.3 Referral and diagnosis outcomes from scenario four

Table 7.18: Referral and diagnosis outcomes from scenario four

Referral and Diagnosis	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Lung cancer	46%	48%	**47%**
Referral to ENT	31%	26%	**28%**
Referral to respiratory physician	15%	26%	**22%**
Laryngeal cancer	23%	9%	**14%**
Blood cancer / lymphoma / haematological disease	0	17%	**11%**
Liver cancer / disease	15%	9%	**11%**
Throat / oesophageal cancer	0	13%	**11%**
GI malignancy	15%	0	**6%**
Lung disease	0	9%	**6%**
Heart failure / cardiomyopathy	8%	0	**6%**
Thyroid cancer	0	4%	**3%**
Referral to TB nurse	0	4%	**3%**
Ischemic heart disease	0	4%	**3%**

The most common diagnosis voiced by participants was lung cancer (47%) followed by a range of diagnoses linked to Ear Nose and Throat (ENT) which included laryngeal (14%), oesophageal or throat cancer (11%). Other diagnoses verbalised include blood cancer or haematological disease (11%) and liver disease (11%). Seventeen (47%) participants verbalised a lung cancer diagnosis but only eight (22%) voiced a referral to a respiratory physician whilst ten (28%) verbalised an ENT referral, however, thirty six (100%) would order a CXR.

> *I think, have done a chest x-ray and bloods, but actually the hoarse voice there, (...) somebody with a hoarse voice, without the breathlessness I would have fast-tracked up to ENT but with the breathlessness, I now know from reading the guidelines on this other person that hoarse voice can be a Red Flag for lung cancer, which I didn't know previously.NY25F.*

The most common referral pathway voiced by participants was to ENT (28%), closely followed by the referral to a respiratory physician (22%). One participant verbalised a referral to a TB nurse.

> *I think if I didn't really find anything on the bloods, like if she wasn't menopausal there was no other cause for the night sweats, and this hoarse voice has been persisting I think I'd still want to refer her to ENT. I don't know if, I don't think it would fit the two week wait because she's, because of her age but I'd probably do an urgent referral, I'd have to look at the criteria for that and see whether she fitted it or not, but it's, with the cachexia, the night sweats and the hoarse voice, it's quite concerning.NL35M.*

Table 7.18.1: Referral and diagnosis outcomes with experience for scenario four

Referral and Diagnosis	**Experience >10 years n=23**	**Experience <10 years n =13**	**Total n=36**
Lung cancer diagnosis	52%	38%	**47%**
Referral to ENT	26%	31%	**28%**
Referral to respiratory physician	22%	23%	**22%**

Table 7.18.1 shows twelve (52%) participants who had over 10 years' experience voicing a lung cancer diagnosis while only five (38%) of the participants with less than 10 years' experience did so. Six (26%) participants with more than 10 years' experience voiced a referral to ENT compared to four (31%) of those with less than 10

years' experience. Additionally, five (22%) participants who had more than 10 years' experience voiced a referral to a respiratory physician, compared to three (23%) of those with less than 10 years' experience.

7.7.4 Reason for a course of action from scenario four

Table 7.19: Reason for a course of action from scenario four

Reason	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Related to hoarse voice	100%	52%	**69%**
Related to cachexia	54%	52%	**53%**
Related to night sweats	54%	48%	**50%**
Related to breathlessness	54%	35%	**42%**
Related to TB	38%	39%	**39%**
Related to alcohol	15%	30%	**25%**
Related to blood pressure	0	17%	**11%**
Related to diet	8%	9%	**8%**

Table 7.19 shows the main reasons for a course of action are associated with the symptoms that are presented within the scenario. The majority of participants described hoarse voice (69%) and cachexia (53%) as the main reason for a course of action.

> *I think if she's had a chronic hoarse voice, certainly going on longer than four weeks or so, that would constitute a two week wait referral to ENT, but I, I've kind of had experience in the past of people going to see the ENT case with chronic hoarse voice and not having a chest x-ray carried out when they get there, so, I think I, I'd do both separately.ER12M.*

This was closely followed by night sweats (50%) and breathlessness (42%). Other reasons for action relate to TB (39%) and alcohol (25%). A small number were for blood pressure (11%) and diet (8%). The majority of participants verbalised their course of action in relation to the symptoms presented in scenario four, however, associating these to a particular course of action when responding to the scenario remained mixed. This further highlights the limitations with the method and the differences in what is verbalised and analysed and what is thought and often remains unsaid.

> *So night sweats, the history of TB we need to exclude TB and other causes of night sweats so you, you might do some blood tests as well as a chest x-ray.HU10M.*

(...) so I would find out a bit more about how, the character of the breathlessness, the night sweats. I'd obviously examine her, particularly looking for any lymphadenopathy in her neck.ER15F.

The data in table 7.19 show some differences between semi-rural and urban participants. All semi-rural participants verbalised a hoarse voice as a reason for action compared to only half from the urban participants.

Table 7.19.1: Reasons for action applying experience as a factor for scenario four

Reasoning	**Experience >10 years n=23**	**Experience <10 years n=13**	**Total n=36**
Related to hoarse voice	65%	77%	**69%**
Related to cachexia	57%	54%	**53%**
Related to night sweats	49%	54%	**50%**
Related to breathlessness	35%	54%	**42%**

Table 7.19.1 shows fifteen (65%) participants over 10 years' experience verbalised a hoarse voice as a reason for action whilst ten (77%) participants with less than 10 years' experience voiced the same.

7.7.5 Safety-netting outcomes for scenario four

Table 7.20: Safety-netting outcomes for scenario four

Safety-netting	**Semi-Rural n=13**	**Urban n=23**	**Total n=36**
Total number of participants who verbalised some form of safety-netting	38%	29%	**39%**
Specific terms verbalised			
An explicit request for patients to return after a specific time period	8%	13%	**11%**
An explicit request for patient to return for a review with results (chest x-ray, bloods, other tests)	15%	9%	**11%**
A request for a follow up / bring her back no time period specified	8%	9%	**8%**
A request for a follow up / bring her back that is vague and implicit	8%	4%	**6%**
Verbalises safety netting via an ENT referral	0	4%	**3%**

Overall, fourteen (39%) from the thirty six participants verbalised some type of safety-netting for scenario four. There was no specific dominant term verbalised. The two most common terms voiced for safety netting were for patients to return after a specific time period (11%) and participants who voiced a patient to return after the results had come back (11%).

> *I would then want to examine her from a chest and heart point of view, and organise some tests which would include a chest x-ray which she'd again be given the form for and she would then be given a piece of paper to book an appointment at the desk to come back and have her blood tests checked and I would then want to see her in two weeks' time to review her blood tests and hopefully the chest x-ray would be back.HU22M.*

The other term voiced was a request for a follow-up with no specified time period (8%) however, from those three participants two mentioned that the patient was to return quickly or a matter of some urgency. Other terms verbalised by participants included a vague follow-up or return appointment (6%) and one participant described how he would apply safety netting via a referral to ENT.

7.7.6 Summary interpretation of scenario four

This summary relates to scenario four (full clinical scenario on p. 177). Within evaluation cachexia was voiced by two thirds of participants (69%), and what was collected by participants was a hoarse voice (42%). There were similarities between evaluation and the collection code and the symptom hoarse voice. This suggests that red flag symptoms were prominent within the cognition of participants. There were also similarities for a reason for action code in which the majority of participants described a hoarse voice (69%). The findings show all participants requested a CXR (100%) which was closely followed by a request for a blood test (83%). The most common referral pathway voiced by participants was to ENT (28%) and then a referral to a respiratory physician (22%). Almost half of participants vocalised lung cancer (47%) as a possible diagnosis and then a range of diagnoses linked to ENT which included laryngeal (14%), oesophageal or throat cancer (11%). Seventeen (47%) participants verbalised a lung cancer diagnosis and only eight (22%) voiced a referral to a respiratory physician while ten (28%) verbalised an ENT referral. These verbalisations are in contrast with findings within diagnostics where all participants requested a CXR suggesting complexity and uncertainty of the clinical pathway and implying that a referral into secondary care relies on the outcomes of the CXR which can sometimes produce unreliable results.

7.8 Summary of the think aloud findings

This discussion section provides a summary of the findings from the four clinical case scenarios. It is important to highlight a cautionary element to think aloud data presented in this thesis. It does not eliminate the artificial context and a sense of theatre and competitive characteristics from participants aiming to look good in front of an external interviewer. On a number of occasions participants asked 'had they passed the test' even though at the beginning of the study it was made clear this was not a test or exam as the main focus was to understand participants' cognitive processes.

Across all the four scenarios the request for a CXR was central and was verbalised by the majority of participants. Additionally, other similarities involved the intent to conduct an examination and requests for blood tests. Participants verbalised lung cancer as the main diagnosis from three of the four scenarios, however, within scenario two cardiac failure was closely followed by anaemia and then by lung cancer. The findings indicate participants were alert to the possibility of lung cancer within each scenario although other diagnoses were also being considered which implies a level of complexity surrounding the diagnosis of lung cancer. The complexity of diagnosing lung cancer was a key theme that emerged from the open ended interviews and is discussed in detail in chapter 6 section 6.4.2. Arguably, the alertness to lung cancer across all scenarios may be unsurprising as recruitment and participant information about the research study focused on lung cancer.

The information that participants collected as part of the formulation of a clinical hypothesis varied across each scenario with one noticeable trend from three of the four scenarios being the collection of symptom information. Whilst in scenario one the majority of the participants focused on collecting patient factor information relating to the patient being self-employed, a smoker and male, the main focus for scenarios two, three and four were related to symptoms which were COPD, chest pain or a hoarse voice. On analysing the tables concerning evaluation, the data revealed similarities across all four scenarios in relation to symptoms. Approximately two thirds of participants within the four scenarios made an evaluated judgement relating to the symptoms. The symptoms were haemoptysis, breathlessness, weight loss and cachexia. The inferences that could be drawn from this suggest participants were alert to the different symptomatic presentations associated with lung cancer. Again, this may be unsurprising as the research project was presented within the context of lung cancer and does highlight a potential limitation in the design complexity and associated risk for the four clinical case scenarios. However, some participants did find it testing when faced with ambiguous, atypical or challenging features from patients involving COPD, a non-smoker and stand-alone weight loss which created a differential diagnosis. Challenging and atypical features were key themes in the open-ended interviews and was discussed in chapter 6, section 6.8.1. Furthermore, some participants highlighted that patients rarely present with classic text book symptoms.

There were some similarities across the scenarios involving referral pathways. The main referral term verbalised by the majority of participants was to a chest physician, with scenario four being the only exception with participants preferring to refer to an ENT consultant rather than to a respiratory physician. The reason for the ENT focus may relate to the context of the scenario and symptoms described (see box 7.4, p. 177) which highlighted a women who was a non-smoker who had a hoarse voice and looked cachectic. These symptoms may be viewed as atypical and don’t necessarily warrant suspicion of lung cancer. Within scenario two only one participant verbalised a referral to a chest physician, suggesting an emphasis on initially managing patients with similar characteristics and COPD in primary care. This finding seems dichotomous as there was a large weighting for a CXR. One hypothesis worthy of consideration may relate to participants simply preferring to wait for the results before making a referral decision as it is unlikely participants would not decide to refer once results from the CXR have been received and it is suggestive of an abnormality. This, of course, is assuming the CXR is abnormal as it was noted by some participants CXRs can be unreliable as a diagnostic tool. Additional tests may be required involving a biopsy and a bronchoscopy to confirm the diagnosis.

The findings revealed a similar number of participants verbalised some type of safety-netting across all scenarios. The main safety-netting term verbalised was the request for the patient to return for a review after the results had come back from a test which was verbalised across three of the four scenarios. The only difference was scenario one where participants voiced an in-house mechanism involving the participant ringing him up, having a secretary to follow-up or an electronic message or screen prompt.

There are differences in the approach to safety-netting for scenario one compared to the other scenarios which is suggestive of a more direct intervention. This may relate to the patient factors described in scenario one. These factors include age which was stated as a 57 year old male and also a working class smoker who may be viewed as an infrequent attender. The data suggests there may be an increased risk of losing the patient to a follow-up appointment. Other factors that prompted a different safety-netting approach are the seriousness of red flag symptoms (haemoptysis and cough) which were presented in scenario one.

The data was presented considering factors involving semi-rural and urban locations. As discussed earlier in this chapter the rationale for applying the urban and semi-rural characteristic was to examine if there were any potential differences in decision-making relative to participants' geographic location. Overall, the findings suggest there was little variation when applying a geographical characteristic of urban and semi-rural with participants' decision-making. There were a total of twenty three (23) urban and thirteen (13) rural and semi-rural participants. Within table 7.13 which involved scenario three there was a much lower number of urban participants verbalising a lung cancer diagnosis than semi-rural participants. This finding seems contrary to expectation as a recent study by Iyen-Omofoman, Hubbard et al. (2011), which analysed societal distribution of lung cancer using Mosaic Public SectorTM segmentation classification, demonstrated higher lung cancer incidence amongst groups aligned to a more urban context. What can be drawn from the findings in table 7.13 is less clear as the findings from the open-ended interviews suggest participants were alert to lung cancer and the associated patient characteristics that demonstrate their being at risk. While table 7.11 reveals a similar number of participants collecting information on chest pain however, the data show a much higher proportion of semi-rural participants verbalising the collection of chest pain compared to their urban equivalents. Table 7.19 shows all semi-rural participants verbalised the reason for a course of action which was related to a hoarse voice while only half of the urban participants voiced this.

To conclude, findings show the request for a CXR was central across all scenarios and participants were alert to the possibility of lung cancer with other diagnoses also being considered which could be inferred was a result of the complex nature of diagnosing lung cancer.

Participant knowledge was high, espoused practice was high and compliant with NICE guidance. The key question, however, still remains unanswered: 'why does late diagnosis still remain an issue?' In order to further understand this anomalous position other issues need to be considered. Firstly, all four clinical scenarios might be interpreted as too high risk and participants have responded accordingly creating a limitation with the data set. The findings by Hamilton (2009, p. 84), which examined symptoms for lung cancer and produced positive predictive values for a range of symptoms related to lung cancer concluded that whilst haemoptysis had a risk value of above 2% it was also relatively rare. This led Hamilton to posit the position that "to expedite diagnosis of lung cancer, the focus will have to be on the softer symptoms, such as dyspnoea and cough". Reflecting on the findings by Hamilton's CAPER study and in relation to the four clinical scenarios presented in this thesis the student's findings would suggest some commonality with decision making with the majority of participants seeming to have responded appropriately to the levels of risk identified in the Hamilton CAPER study findings.

Other limitations to consider are the nature of recruitment and the self-selection of participants, as this may have [has] led to a significant bias in the recruitment process. Other considerations may involve a host of contributory factors involving the practice structure and culture, complex and challenging patients involving atypical presentations, the increasing expectations of patients and the threat of litigation. These factors which have all been examined in detail in chapter six will be synthesised along with the findings from chapter seven to allow for further interpretation and the development of patterns and relationships to draw conclusions and establish reliability.

Chapter 8

Data synthesis of the findings from the open-ended interviews and think aloud scenarios

8.1 Introduction to chapter

This chapter (8) will provide a synthesis of the findings from the open ended interviews and the think aloud clinical case scenarios. Key findings from the open ended interviews and the think aloud case scenarios will be presented in table form and a comparison of the findings exploring similarities, patterns and contrasts will be discussed. The findings will relate to the original research questions. The main focus of the study aimed to answer the question: What are the factors influencing GPs in the recognition and referral of suspected lung cancer? Specific questions addressed were:

- What are GPs perceptions and understandings about the recognition and referral of suspected lung cancer?
- What practice-related factors do GPs perceive as having an impact on the recognition and referral of suspected lung cancer?
- What individual characteristics do GPs perceive as having an impact on the recognition and referral of suspected lung cancer?
- How do GPs consider the possibility of lung cancer and what actions may ensue from this consideration?
- What are perceived by GPs as the facilitators and barriers to the recognition and referral of suspected lung cancer?
- How do GPs perceive that lung cancer recognition and referral could be enhanced in primary care?

Two methods were used to address the aims and objectives as Mays and Pope (2000, p. 51) state “triangulation compares the results from either two or more different methods of data collection (for example, interviews and observation) or, more simply, two or more data sources”. Table 8.1 describes a summary of the research findings from the open ended interviews and the think aloud clinical scenarios. The table highlights both sets of findings which have been aligned to the research questions posed in order to gain a deeper understanding and corroborate interpretation.

8.2 Summary table of both sets of key research findings

Table 8.1: Key research findings

Research question	Findings from open-ended interviews	Findings from think aloud	Comments
What are GPs perceptions and understandings about the recognition and referral of suspected lung cancer?	There was a consistency amongst participants who were alert to at risk groups. These consisted of smokers, the elderly, working class and men. Knowledge of lung cancer symptoms was high. Participants viewed red flag symptoms for lung cancer to include; persistent cough, breathlessness, haemoptysis, weight loss, chest infection and hoarse voice.	The request for a chest x-ray was central across all scenarios and participants were alert to the possibility of lung cancer with other diagnosis also being considered. This implies a level of complexity in the diagnosis of lung cancer. The main referral was to a chest physician with some participants preferring to refer to an ENT consultant if symptoms were suggestive of laryngeal or oesophageal cancer.	Findings are from both open- ended and think aloud methods. The findings suggest GPs knowledge and awareness of lung cancer symptoms was high. The GPs antennae were alert to groups most susceptible to lung cancer. The data suggest decisive decision making which was compliant to current guidelines these could be perceived as facilitators in the recognition and referral of lung cancer.
What are perceived by GPs as the facilitators and barriers to the recognition and referral of suspected lung cancer?	(Facilitator) It is suggested knowledge and symptoms and high awareness of at risk groups by participants could be viewed as a facilitator.		All the findings are from the open ended interviews. It could be argued that high awareness of knowledge and symptoms and of the risk groups are facilitators. It is argued there are many facilitators in the recognition and referral of

Research question	Findings from open-ended interviews	Findings from think aloud	Comments
	(Facilitator) Interpersonal and communication skills were seen as important which established rapport and was an enabler for effective clinical decision making.		suspected lung cancer, however the data also suggests participants have to overcome many barriers to recognise and refer suspected lung cancer. Whilst having good knowledge of symptoms, good communication skills, access to diagnostics, the SEA and effective internal processes were viewed as facilitators, there also seemed to be many barriers and much complexity involving individual patient factors and wider cultural and social determinants that influence participants in recognising and referring of suspected lung cancer lung cancer. The findings from the open ended interviews also highlighted some ambiguity between what is perceived as a barrier or a facilitator. This is particularly poignant for the theme of pressure on GPs not to miss a diagnosis.
	(Facilitator) The data suggest there was an interface between improvement and the use of the quality improvement tools such as significant event audit (SEA).		
	(Facilitator) Access and availability of diagnostics was viewed as important in reducing system delay.		
	(Facilitator) Internal organisational processes that obtain results quickly were viewed as important in reducing system delay and may influence therecognition and referral of suspected lung cancer.		

Research question	Findings from open-ended interviews	Findings from think aloud	Comments
	(Facilitator and barrier) Pressure on GPs not to miss a diagnosis. (Barrier) The majority of participants describe patients presenting with multiple symptoms which often led to difficulties in clinical decision - creating potential delays due to the possibility of choosing the wrong treatment pathway.		
	(Barrier) The majority of participants were alert to complaints and litigation which was often described in a negative context. There was some variation amongst participants in its influence on their clinical-decision making causing some to adopt defensive practice. Some participants were consciously aware of litigation and were actively safety netting while others attest that it does not affect their practice.		

Research question	Findings from open-ended interviews	Findings from think aloud	Comments
	(Barrier) Atypical or challenging presentations make it difficult to diagnose lung cancer.		
What practice-related factors do GPs perceive as having an impact on the recognition and referral of suspected lung cancer?	Educational practice characteristics may contribute to an organisational culture that enables practice staff to share and transfer up-to-date evidence and new knowledge. Internal organisational processes that obtain and process results quickly were viewed as important in reducing system delay and may influence the referral and diagnosis of lung cancer.		All the findings are from the open-ended interviews. What these interviews unearthed were the organisational and cultural nuances of general practice that were often influenced by social and organisational structures. These may influence the recognition and referral of suspected lung cancer .
How do GPs perceive that lung cancer recognition and referral could be enhanced in primary care?	The data suggest there is an interface between improvement and the use of the quality improvement tools such as significant event audit (SEA). Internal organisational processes that obtain results quickly were		All the findings are from the open-ended interviews. The data suggest some overlap of findings between practice-related factors and what can enhance lung cancer diagnosis in primary care. The findings suggest quality improvement tools like significant event audit (SEA)

Research question	Findings from open-ended interviews	Findings from think aloud	Comments
	viewed as important in reducing system delay.		may be viewed as a facilitator to improving referral and diagnosis. However, further work may be needed to address the negativity that is perceived by some participants that is associated with SEA. This was sometimes due to how the SEA was facilitated.
How do GPs consider the possibility of lung cancer and what actions may ensue from this consideration?	There was a consistency amongst participants who were alert to at risk groups. These consisted of smokers, the elderly, working class and males.	The majority of participants focused on collecting information on patient factors and symptoms in order to generate a clinical hypothesis. Clinical evaluations were based on the symptoms. The main symptoms participants focussed on were haemoptysis, breathlessness, weight loss and cachexia. Participants were alert to the different symptomatic presentations associated with lung cancer. Actions by participants were in relation to the symptoms. Safety netting was verbalised with	All the findings are drawn from both the open-ended interviews and the think aloud method. There were similarities between both methods with a focus on patient factors. Participants generated clinical hypotheses and made decisions based on symptoms and patient factors.

Research question	Findings from open-ended interviews	Findings from think aloud	Comments
		the majority requesting the patient to return for a review after the results from a chest x-ray, blood test, etc.	
What individual characteristics do GPs perceive as having an impact on the recognition and referral of suspected lung cancer?	Intuition may be viewed as pattern recognition, which is based on years of experience. Individual differences were described through the lens of clinical performance. This was often within the context of referrals and the differences between being viewed a ‘cautious practitioner’ or a ‘conscientious practitioner’.		Participant experience and individual differences emerged from the data. Experience was discussed within the context of intuition and pattern recognition and the cognitive effect this may have on their decision-making over many years working in general practice. Individual differences were described within the context of participant’s diagnostic ability which involved internal and external performance targets.

8.3 Data synthesis

The goal of synthesis is not to integrate the studies and potentially risk obscuring the differences but to understand commonalities and differences between research findings. The aim is to explore any patterns identified across both sets of results and discuss the possible factors that might explain variations. Table 8.2 presents the findings from chapter 6 (open-ended interviews) and chapter 7 (think aloud clinical case studies) and describes the similarities between the key findings.

8.3.1 A summary table of similar findings from both sets of data

Table 8.2: A summary table of similar findings from both sets of data

Open-ended interviews	Think aloud clinical scenarios
• Knowledge of lung cancer symptoms was high • Alert to lung cancer and of at risk groups • Atypical or challenging presentations can make it difficult to difficult to recognise and refer suspected lung cancer • Patients presenting with multiple symptoms which often led to difficulties in clinical decision-making • Safety netting to limit complaints and litigation.	• Knowledge of lung cancer symptoms was high as was compliance with NICE guidance • Participants were alert to the possibility of lung cancer within the scenarios • Patient factors are important in generating a clinical hypothesis • Different diagnoses were being considered which implies a level of complexity in the recognition and referral of suspected lung cancer • Similar number of participants across all scenarios were actively safety netting.

Table 8.2 shows the homogeneous findings from the two-method approach within this thesis. The findings from the open-ended interviews show knowledge of lung cancer symptoms was high. The findings highlight participants were consistent in what they viewed as red flags: symptoms which included persistent cough, hoarse voice, breathlessness, haemoptysis, weight loss and chest infection. There were similarities to be found in the think aloud findings with many participants verbalising the symptoms which were described in the clinical scenario as significant and recognition of the seriousness of the symptoms in relation to lung cancer. These included haemoptysis, breathlessness and weight loss. The findings suggest there does not seem to be a knowledge deficit regarding lung cancer symptoms amongst interviewed participants.

Additionally, the findings from the think aloud scenarios suggest compliance to NICE guidance was high, with the majority of participants across all four scenarios requesting a CXR and blood tests. These findings accord with a Canadian study looking at delays in lung cancer. The study found 92% of the patients interviewed (48) had investigations ordered following the initial presentation. The investigations included: CXR (98%), CT scan (56%) and blood tests (36%) (Ellis and Vandermeer 2011).

The alertness to lung cancer within at risk groups was a dominant theme within the open-ended interviews. These risk factors included smokers, the elderly, working-class patients with an increased suspicion towards men. The findings from the think aloud scenarios indicated participants were alert to the possibility of lung cancer and highlighted a focus on patient factors including smoking status, job, working status such as being self-employed, age and gender.

There were some comparable findings between both sets of data relating to the complexity involved in the the recognition and referral of suspected lung cancer. The open-ended interview findings highlighted a difficulty in the recognition and referral of suspected lung cancerwith many participants recalling stories of patients with atypical or challenging presentations. These complex patients often had multiple symptoms or comorbidities creating a vague façade with the potential of misdirecting a clinical hypothesis. In comparison, the findings from the think aloud scenarios were viewed as 'testing' by some participants when they were faced with ambiguous clinical features which created multiple possibilities for referral pathways and diagnosis.

Safety netting was a theme to emerge from both sets of data. Safety netting with the open- ended interviews was discussed within the context of litigation and complaints with some participants actively safety netting to reduce potential litigation or complaints. Safety netting was common across all four clinical scenarios. These were often in relation to request for patients to return after participants had received the results of tests or the use of 'in-house' mechanisms to follow up patients.

Some of key findings from the open-ended interviews were 'stand-alone' in that there were neither similarities or contrasts or patterns between them and the think aloud data. These include interpersonal and communication skills, pressures on GPs not to miss a diagnosis, using Significant Event Audit (SEA) as a tool for improvement, efficient internal and organisational processes that process and obtain results.

8.3.2 Contrasting findings

While the open-ended interviews were analysed using thematic analysis which is an iterative process, the think aloud method was subjected to protocol analysis which was more aligned to content analysis and counting the numbers of different verbalisations to produce a weighting of different terms verbalised. The aims of the clinical scenarios were to capture participants' decision-making processes and to gain an understanding of cognitive processes within the context of the consultation, whilst the open-ended, in-depth interviews were aimed to gain a richer understanding of GPs views, attitudes, experiences, values and beliefs about the referral and diagnosis of lung cancer. The inferences that can be drawn from the findings suggest a certain level of homogeneity and provide confirmation rather than illuminating any contrasts that may have been worthy of further discussion.

8.4 Summary

The findings from the think aloud method emphasised the focus participants placed on symptoms, context and patient factors in the development of a clinical hypothesis. It was then a process of seeking to prove or disprove a hypothesis by working through a list of differential diagnoses and complexity within the time constraints and context of the consultation. The think aloud findings added reliability by corroborating some of the open-ended interview findings regarding knowledge of red flag symptoms and the compliance of lung cancer guidelines. The open ended interviews also introduced a broader perspective about practice factors involving internal organisational culture, structures and processes not mentioned in think aloud but which may influence participants in consultations.

To conclude, the overall aim of the research study was to unearth and examine factors that influence GPs in the recognition and referral of suspected lung cancer which the students argues this has been achieved. The research findings highlight factors relating to patient characteristics, challenging symptom presentations and organisational structures and processes have a role to play in the recognition and referral of suspected lung cancer. It is suggested an ideal general practice model that has organisational characteristics and structures which involve regular knowledge transfer opportunities, peer to peer discussion, a learning and sharing culture and has effective internal organisational processes that obtain and process results quickly can help facilitate the recognition and referral of suspected lung cancer.

Chapter 9

Discussion

9.1 Introduction to chapter

This chapter will discuss the findings of the study and their potential meaning in the context of the literature, their relevance to practice and their implications for future research. It will provide an integrated discussion of the findings from the open-ended interviews and the think aloud clinical case scenarios, highlight how the research contributes new knowledge to the field and where it fits into the body of existing research. The chapter will then examine the strengths and limitations of the research presented in this thesis and its implications for policy, practice, and future research. Finally, the last section will consider the student's doctoral journey and the challenges faced along the way and what might have been done differently. Summaries of the findings from the open-ended interviews and the think aloud case scenarios are presented in section 6.9 and 7.8. The key findings from both sets of data were synthesised to gain deeper understanding and corroborate interpretation and are presented in chapter 8.

9.2 Discussion of research findings

The key findings:

9.2.1 What are GPs perceptions and understandings about the recognition and referral of suspected lung cancer?

The majority of participants viewed the recognition and referral of lung cancer within a negative context, which is unsurprising given the evidence for survival outcomes. Participants reflected on their experiences and verbalised timescales for survival ranging from a few months to no longer than a couple of years. While many described patients with lung cancer as having a poor prognosis with only a minority experiencing positive outcomes due to their patients having a lobectomy or radical radiotherapy treatment, there was no evidence of participants not wanting to refer patients as quickly and as efficiently as possible. Most participants believed that early diagnosis of cancer using two week wait referrals can save lives: Hamilton, however, suggests that there is little evidence to show speedier action can reduce mortality for lung cancer, though this may be different for other cancers. It could be argued that participants are just extrapolating their knowledge of other cancers or practising within the parameters of mandatory government policy. The finding is of particular interest as, in his discussion paper about misconceptions of cancer diagnosis, Hamilton (2009) posits that some clinicians and researchers are nihilistic about whether early diagnosis confers any real benefits and that this nihilism is particularly common in lung cancer. While Hamilton holds the view that this is not a widely held perception, and the students' research findings seem to corroborate this, Hamilton does suggest that there is currently little evidence available to show speedier action can reduce mortality. More recently the systematic review by Neal et al. (2015) discussed in chapter 1 aimed to review all cancers and examine if shorter times to diagnosis were an influencing factor with more favourable outcomes. The study found heterogeneity precluded definitive findings but it highlights the cancers that demonstrated associations between shorter times to diagnosis and positive outcomes were breast, colorectal, head and neck, testicular and melanoma. However, there is a need for a cautionary lens as Neal highlights that the studies included in their review for lung cancer were evenly split in reporting positive, negative and no association between diagnostic intervals and outcome. This leaves lung cancer in an unclear position and suggests the literature to date shows little evidence to demonstrate a link between shorter time to diagnosis for lung cancer and improved mortality.

Further analysis revealed a consistency amongst participants in beliefs about the groups they considered to be 'at risk' of lung cancer. These beliefs corroborate findings from the literature by Ramirez et al., 1999; Macdonald et al., 2006; Mitchell et al., 2008 in which practitioner referral behaviour is influenced by patient characteristics. These groups consisted of the elderly, people who are working class, male and smokers. Knowledge of lung cancer symptoms was also high. This was partially due to the majority of participants experiencing large volumes of patients presenting with respiratory problems on a daily basis which heightened their awareness of the possibility of lung cancer amongst their practice population. However, there is also the potential risk of complacency as a large proportion of respiratory presentations will not be cancer. There was consistency amongst participants in viewing red flag symptoms for lung cancer to include persistent cough, breathlessness, haemoptysis, weight loss, chest infection and hoarse voice. Lung cancer is considered a common cancer, a view which the participant findings seem to corroborate, though this contrasts with Hamilton and Sharp (2004) whose study described lung cancer as being a rare encounter, implying that many GPs have limited personal experience of its diagnosis, thus potentially influencing a GP's threshold with regards to recognition or referral of a lung cancer. However, what this study adds is that although the diagnosis of lung cancer is rare, participants reported that they think about it almost every day. To strengthen the argument findings from the clinical case scenarios are considered. The data highlighted that the request for a chest x-ray was central across all four scenarios and participants were alert to the possibility of lung cancer with other diagnoses also being considered.

9.2.2 What practice-related factors do GPs perceive as having an impact on the recognition and referral of suspected lung cancer?

Practice-related factors such as access, practice processes and internal systems and organisational structures have been explored in very few studies in relation to cancer diagnosis, though an Australian study by Jiwa, Halkett et al. (2007) highlighted how organisational management and culture, team communication and the work environment are factors that can influence a cancer diagnosis.

Participants accentuated the importance of having robust and efficient internal organisational processes in place to reduce any potential system delay in the recognition and referral of suspected lung cancer. The internal processes consist of systems that can obtain diagnostic results quickly so positive results can be acted upon, and other processes which may involve computer screen pop-ups or prompts which act as mechanisms for safety-netting or ensure that patients are referred onto the appropriate pathway. Teaching and training practices were viewed by some participants as contributing to the delivery of higher quality patient care. These are general practices that have been externally assessed and externally peer reviewed and become accredited with teaching medical students or trainee GPs. Additionally, there is also the impact of the Care Quality Commission and their role as inspector and external reviewer of general practice. Part of their role will be to encourage GP practices to improve, as observed within five key areas, asking the following question: is care safe, effective, caring, responsive and well-led? There is much debate on what constitutes quality patient care. According to Campbell, Hann et al. (2001) the components that define quality of care are a combination of access to and the effectiveness of both clinical and interpersonal care, that is, how easily can patients get health care and is the care any good when they are there? A similar position is taken by The King's Fund (2011) report which suggests two key measures of quality of care; firstly the Quality Outcomes Framework (QOF) which was designed to improve quality by rewarding GP practices for meeting certain clinical performance indicators, and secondly patient experience which can involve access to appointments and consultations with staff.

It is suggested that teaching and training practices may be attuned to a regular exposure of current literature and thinking, and new guidelines and ways of working which could be interpreted as a facilitator for GPs in maintaining standards and quality of care, thus potentially influencing the referral and recognition of lung cancer. It is also suggested that one of the quality indicators in becoming a teaching or training practice may be within the quality of patient consultations, therefore assuming GPs in teaching and training practices deliver higher quality patient consultations. This is in contrast with Hansen et al. (2011) whose questionnaire study concluded GP characteristics were not associated with doctor delay in cancer diagnosis, however, they did find some GP characteristics associated with patient and system delay. GP characteristics were defined as seniority, list size, practice organisation, CME, job satisfaction and level of burnout. Other characteristics that can influence performance may include organisational structures and systems that contribute to maintaining accreditation for teaching or training status. Again, these structures and systems may give increased opportunities for GPs to regularly share learning and new knowledge and contribute to the teaching of students or trainee GPs, but also be exposed to new ideas and thinking from students and trainees. If these suggestions are correct this would have implications for practice with the potential increase in the quality of care in general practice generally and within the area of cancer specifically. For policy it could mean the implementation of new standardised organisational structures and processes across general practice to potentially increase standards.

9.2.3 What individual characteristics do GPs perceive as having an impact on the recognition and referral of suspected lung cancer?

The results from the research study revealed that individual differences are recognised and described in a number of ways. Participants' individual differences were often contextualised within a clinical performance context. Clinical performance was sometimes described within the context of referrals and whether they had been perceived by either other clinical colleagues, CCGs or other external organisations as a cautious practitioner or a conscientious practitioner. These, however, were not mutually exclusive. The findings demonstrated that many participants were aware and reflective both of their clinical decision-making and that their own clinical performance involving referrals was very much under scrutiny from their peers as well as external organisations. The findings highlight some variation amongst participants about the interpretation of a cautious or conscientious practitioner. A cautious practitioner was viewed by some participants as a non-confident doctor due to their high referral rate and a conscientious practitioner viewed as adopting a safety-netting procedure. Whilst these views may not be in direct conflict with each other they seemed to be presented as such by participants, a behaviour perhaps encouraged by an inability to clarify the differences between the two meanings. However, it is important to highlight the broader context of these views as the research study was carried out when new government policy was being introduced and a reconfiguration of primary care was taking place. This meant that the newly formed Clinical Commissioning Groups (CCGs) led by GPs were tasked with reducing costs as part of the government's drive for cost efficiencies across the NHS. It could be argued that many participating GPs and their general practices felt a downward pressure from CCGs to review their referral rates to further reduce the demands on secondary care. As a result of this many participants may have had a heightened awareness about their referral practices allowing the bringing of their concerns to the forefront of the conversation when probed about individual differences.

As described in chapter 6 section 5.5, some participants considered that personality bore some influence on recognition, referral and patient care. The participants described personality within the context of individual differences and related this to communication styles. Communication was verbalised by participants in a positive and a negative context. Participants, who verbalised communication in a negative context, implied poor quality communication and listening skills by the GP could potentially lead to a delay in diagnosis. Those who described communication in a positive context viewed professionals as having good listening and communication skills within the patient consultation which helped facilitate a quicker referral or diagnosis. According to Arora (2003), the exploration of doctor communication behaviour is an expanding area. Her study reviewed current literature on patient - doctor communication and found key elements of doctor communication that involved interpersonal communication, information exchange, and facilitation of patient involvement in decision-making can have a positive impact on cancer care and patient outcomes; the study did not note the impact it might have on referral, however.

Some participants perceived their own personality as being 'nosy' or having a genuine interest in people or being a completer or a finisher. Others took personality to mean being a good listener and good communicator within the patient consultation. Zandbelt, Smets et al. (2006) reported that clinicians can differ in their communicative behaviour depending on patient characteristics by adopting inter-individual variation, that is, they adjusted their behavioural style according to the situation. The student's findings corroborate Zandbelt's as some participants also verbalised how they would tailor communication depending on patient characteristics.

9.2.4 How do GPs consider the possibility of lung cancer and what actions may ensue from this consideration?

The main findings to emerge from the think aloud clinical scenarios considered the focus participants placed on symptoms, patient factors and context in their formulation of a clinical hypothesis. The findings from think aloud demonstrated that ordering a CXR was a central action across all four clinical scenarios, implying that the majority of participants were alert to the possibility of lung cancer, and compliant with NICE guidance; however, other diagnoses were also being considered suggesting that there is a layer of complexity involved in the referral and recognition of suspected lung cancer. One of the main understandings to emerge from the open-ended interviews was regarding how GPs make decisions. Patient factors were a dominant theme to emerge from the research findings. Within the literature patient factors are defined by psycho-social or socio-demographics such as age, gender, social class, occupation, education, health expectations and the wider social environment. The findings demonstrated that the majority of participants had a higher index of suspicion when dealing with certain groups who may be associated with an increased risk of lung cancer. The socio-demographics of these groups include lower working class, manual workers or uncomplaining stoical male patients who smoke and are elderly. While it may be suggested that social class and smoking status can be objectively defined whereas the classification of the uncomplaining stoical male is more subjective, it was perceived by the majority of participants to be an important characteristic when assigning a level of risk to patients. The findings suggest that these myriad factors contribute to the participant's formulation of a clinical hypothesis with each factor prompting participants to increase their suspicion. One interesting finding described by several participants (see chapter 6 section 4.1) was that of gender differences of patients and in particular with male patients. It was perceived by some participants as a cause of late presentation due to men being 'stoical'. The recent study by Forbes, Simon et al. (2013) examined differences in the awareness of cancer and individual beliefs across a range of countries including the UK, and found gender and other participant demographic factors involving age and education had only a limited impact. The main research findings from the study did, however, highlight that the UK had "the highest perceived barriers to symptomatic presentation, but symptom awareness did not differ from other countries", (Forbes, Simon et al. 2013, p. 292). Furthermore, within the study 34% of UK participants reported that they worried about wasting GPs time and that this would be a barrier to their presenting. This reflects the findings within this thesis and may be partly related to stoicism or people feeling they want to protect the NHS and not misuse it. What is noteworthy in the thesis findings is that within the same discussion participants seem to suggest that being stoic is a valuable quality in people. This suggests that to encourage earlier presentation an approach is needed that discourages a particular patient quality that some participants seem to admire and value. These findings may add further light to the growing body of research about the awareness and early diagnosis of cancer and may contribute to the future development of interventions involving earlier awareness and diagnosis of cancer initiatives.

9.2.5 What are perceived by GPs as the facilitators and barriers in recognising and referring for suspected lung cancer?

The main facilitators were perceived to be knowledge of symptoms and awareness of at risk groups, patient relationships, quality improvement tools and internal practice systems. There is also ambiguity with regards the position of some of the findings, that is, whether they act as either facilitator or barrier. This is particularly true of pressure on GPs not to miss a diagnosis. Whilst this pressure could focus the mind of participants for the referral and recognition of lung cancer it could also act as a barrier if pressure exerted by external organisations to effect particular efficiency measures were to conflict with a participant's desire to operate autonomously .

It is suggested that participants' knowledge of lung cancer symptoms, compliance of NICE guidance is high and awareness of at risk groups are viewed as facilitators in the recognition and referral of suspected lung cancer. The interviews with participants posit GP/patient relationships as a key facilitator in the recognition and referral of lung cancer. Participants considered the value of good interpersonal and communication skills as being the establishing rapport and trust which in turn enables the gathering of appropriate patient information. These qualities are seen as important facilitators within the patient consultation and as contributing to more efficient and effective medical decision-making. According to Deveugele, Derese et al. (2002), research on doctor-patient communication reveals a number of positive and negative effects of GP communication style. These may involve outcomes such as satisfaction, referrals and compliance. Deveugele et al. (2002) highlight that one area of research within communicative behaviour has demonstrated how communication style might be associated with personal, social or cultural factors such as age, gender, education and ethnicity of doctors and patients. This viewpoint seems consistent with the students' findings as interview participants frequently verbalised the positive and negative of doctor-patient relationships and communication. Participants frequently described their doctor – patient communication and the individual differences of their patients. Individual differences were viewed as stoical, fatalistic or as a "generational thing" with regards to presenting late or being a non-attender. However, individual patient differences were also viewed by some as a barrier to establishing a relationship and rapport. This was sometimes verbalised as patients' stoical attitudes or reluctance to verbalise all their issues, or maybe to mislead or even lie about their symptoms.

The use of quality improvement tools was perceived as a facilitator in the recognition and referral of suspected lung cancer. Respondents talked about quality improvement tools such as clinical audits or significant event audits (SEA) as useful for the practice improvement. The data suggest that participants believe that such tools are useful for practice improvement. The study's findings also suggest that an external clinical audit that involved referrals was viewed by some participants as a mechanism for cost reduction rather than quality even though the majority viewed SEAs as a form of improving quality. It is worth noting that some participants described the SEAs within a negative context due to the nature in which the SEA was implemented, or having had a poor experience of the facilitation and management of the SEA process. The data suggested that teaching and training practice characteristics may be a facilitator of an organisational culture that cultivates the sharing and dissemination of knowledge and new research which may influence participants in the referral and recognition of lung cancer. This theme is has already been discussed in more detail in relation to practice-related factors.

Good access to diagnostics and well-organised and robust internal practice systems that process and access diagnostic results quickly and efficiently are viewed as facilitators in the recognition and referral of suspected lung cancer. The majority of participants described the importance of having effective internal systems that ensure results are reviewed in a timely manner to ensure that patients are referred to appropriate pathways or treatment. It was suggested by participants that having a whole practice approach, in which everyone, from receptionists an secretaries through to clinical staff have a role to play in the efficient obtaining of results .

The main barriers to diagnosing lung cancer were multi-factorial. These included challenging presentations, litigation and the pressure not to miss a diagnosis. The majority of participants described patients presenting with multiple symptoms or a 'web of symptoms' which can create complexity in medical decision-making. This finding is consistent with a recent study by Mitchell, Rubin et al. (2013) who examined SEA lung cancer audits using qualitative synthesis. They found patients who have co-existing disease to be a diagnostic challenge as co-existing disease can mask some symptoms of malignancy making the medical decision needing to be made a complex one: differentiating between an exacerbation of patients co-existing disease and a new malignancy is a difficult task.

Another factor which was interpreted as a barrier was complaints and litigation. According to a recent study by Oyebode (2013) negligence claims against GPs increased 13-fold between 1989 and 1998. The study reports that in 1989 there were 38 claims against GP members of the Medical Protection Society, and by 1998 these claims had risen to 500.

The data suggest participants seemed alert to complaints and litigation within the context of discussing the recognition and referral of lung cancer. Initially, this particular area of discussion was not considered within the scope of the study; however, in the first three interviews all participants brought litigation and complaints into the discussion unprompted.

Complaints and litigation were described within a negative context and inferences drawn from the data suggest that some participants' medical decision-making was influenced by their experience of litigation which may have caused them to adopt a more cautious and defensive practice. This could be viewed as a barrier for participants who want to practice general medicine but work in fear of litigation and the impact it has on the behaviour of others and the overall practice. What is not clear within the data is whether the influence on practice attested by some participants is permanent. Whilst litigation may be viewed as a facilitator by increasing cautious behaviour and making GPs refer more patients for CXRs, one can argue that GPs primarily don’t want to burden secondary care with potentially inappropriate referrals nor worry patients unnecessarily about tests and the possibility of being diagnosed with cancer. Additionally, excessive referral will affect secondary care capacity with the concomitant potential of increased system delay affecting treatment to patients who are deemed appropriate. The findings also highlighted some variation in what was perceived as a complaint and what was litigation. It is therefore important to acknowledge that there is a standard process for general practice when dealing with complaints. It is the practice manager that deals with this process initially and if the complaint is not resolved at this level, it is escalated. However, it should be noted that defence unions can be involved at any stage to give advice. Some participants viewed complaints as an informal issue that could be dealt with internally by the practice manager and some viewed complaints purely from a litigation perspective involving their defence union. It is hypothesised by the student that complaints create a barrier for participants in how they would like to practice as clinicians and may cause them to modify their behaviour, implying a potential increase in CXR referral, and it is suggested that litigation might impact on the overall practice and all individuals working within the organisation. However, there is a polarity to this barrier which means GPs could potentially increase their referrals for a CXR which might have a positive impact on rates of cancer diagnosis so it remains unclear whether it is really a barrier.

9.2.6 How do GPs perceive lung cancer recognition and referral could be enhanced in primary care?

What seems to be clear from the findings is there is no knowledge deficit amongst participants in relation to the awareness of red flag symptoms for lung cancer and their compliance to NICE guidelines. This suggests that little education or training is required on the current guidelines. However, the findings suggest there is potential of an intervention related to unusual or atypical presentations within lung cancer recognition and referral in primary care. A number of practice characteristics were key themes and were viewed as potential enhancements for lung cancer recognition and referral in primary care. These characteristics involved culture, structure and internal processes. The data suggested practice structures which replicate educational practices and involve a consistent approach to learning and the dissemination of knowledge and information were viewed as an important factor in maintaining standards and quality primary care.

There is considerable overlap between the answering of the above research question and the earlier question about practice-related factors and recognition and referral of lung cancer.

9.2.7 What are the factors influencing GPs in the recognition and referral of suspected lung cancer?

The open-ended interview findings were consistent with existing literature and show that lung cancer presentations can be challenging and complex and involve a number of factors which can influence GPs in their recognition and referral of the disease.

The findings from the open-ended interviews suggest that in challenging and complex patients who present with comorbidities such as respiratory disease it is difficult to differentiate between exacerbations of their existing condition or something more sinister such as lung cancer. Other complexities within primary care include the daily volume of patients presenting symptomatically with symptoms such as coughs, breathlessness and fatigue and that most have self-limiting conditions and so identifying those in need of referral or CXR can be challenging. Several patient factors were identified which alert GPs to lung cancer including age, smoking status, socio-economic status and gender. Factors relating to organisational characteristics such as culture and processes may also be a factor in how participants consider the recognition and referral of suspected lung cancer.

The pressure on GPs not to miss a lung cancer was evident within the study findings. Many participants viewed missing or delaying a diagnosis as a failure of their professionalism and their clinical acumen as well as considering the significance for the patient. This diagnostic error led to introspection amongst participants and became a factor in modifying participant behaviour. There is a large body of literature that has examined medical error in detail, and one recent study describes two models of causation of human error. According to Oyebode (2013) there are two approaches to human error: the person approach and the systems approach. He posits that “the person approach focuses on the errors of individuals, and tends to blame individuals for forgetfulness, inattention or moral failure. The systems approach identifies the conditions and systems under which individuals work as the source of the error with the aim of both understanding the origin of errors and building defences to avert them or mitigate their effects” (Oyebode, 2013, p. 325). Within general practice a study by Rubin, George et al. (2003) a classification of errors was developed containing six categories: communication, appointments, prescriptions, equipment, clinical care and 'other' errors. The study found that the majority of errors were with prescriptions (42%) then communication (30%), while clinical care which includes diagnostics was only (2.6%). Whilst it is difficult to draw firm conclusions regarding the prevalence of diagnostic error on one study alone, the low figure given of the low diagnostic error rate amongst GPs is encouraging. It is difficult to establish current figures of diagnostic error from the literature; however, it is possible this figure may have increased over time. One statistic to consider is from a study by Hamilton (2009) who suggests that 14% of negligence claims against GPs were due to the failure to diagnose cancer. It can be argued that whilst diagnostic error does not equal a negligence claim the difficulty to differentiate between error and dealing with challenging, vague and atypical presentations on a daily basis is a part of working with uncertainty within general practice. However, in defence of general practice Hamilton also argues "the problem for GPs is that for every 'missed cancer' there are several patients with similar symptoms who do not have cancer, and who have been spared the worry of investigation" (Hamilton, 2009, p. 443) implying there is much effort involved in reducing error to a minimum. What is surprising within the study is that the majority of participants verbalised experiences of medical error within the context of lung cancer which may be tumour-specific due to the sometimes challenging and complex nature of the recognition and referral of suspected lung cancer. Another major barrier to recognition and referral of lung cancer involves atypical or challenging presentations. To define atypical would be to refer to something that is not typical, conforming to type, unexpected or irregular. A list of atypical and challenging presentations were verbalised by participants and are presented and discussed in chapter 6 section 6.4.2 table 6.3. According to the majority of participants atypical presentations make it difficult to recognise those with potential lung cancer. The majority of participants described clinical situations in which patients presented with symptoms that were not necessarily aligned to respiratory disease or within the parameters of NICE lung cancer guidelines. What is worth noting within the findings is the variation amongst some participants in what is considered to be an atypical or unusual presentation and what was viewed as 'red flag' or salient symptoms and what is described within the parameters of the NICE lung cancer guidance. To add an additional layer of complexity to challenging presentations, Hamilton (2009) raises an important point about the misdirection of education and uses lung cancer as example. He argues that while a cough is the commonest symptom reported by two thirds of GPs before diagnosis most text books and NICE guidelines have haemoptysis at the top of their lists. This is corroborated by the research findings, and there still seems to be some inconsistency amongst participants with regards to the salient features of lung cancer and the key features within the NICE guidance. What this highlights is the need for additional training and awareness in relation to what constitutes atypical and challenging presentations. In addition, further work is needed to establish consistency across primary care and awareness of atypical presentations which is not offered within the current NICE guidance for lung cancer.

9.3 Analysis of key research findings

There are key findings which involve the organisational structure, internal processes and culture of general practices. These findings demonstrate a need for further analysis and discussion in these areas.

Table 9.1: Summary table of contributory factors and how key findings may influence GPs clinical behaviour

Contributory factors	**How key findings may influence GPs clinical behaviour**
Practice structure	• Perceived differences between educational practices and non-educational practice structures and quality of care • Educational practice structure act as a facilitator for the dissemination of new knowledge and information amongst practice colleagues which may be an enabler for GPs in the recognition and referral of suspected lung cancer • Practice structure influence GP medical decision behaviour.
Practice culture	• Using informal or formal channels to communicate with each other to share clinical learning and disseminate new knowledge • The informal channels are implemented in communal work spaces, over morning coffee or lunch usually within a more relaxed and informal setting • The formal channels anchored around business practice meetings.

Contributory factors	**How key findings may influence GPs clinical behaviour**
Internal practice processes	• The importance of having efficient and effective internal organisational systems and processes • Effective internal systems act as a 'safety net', ensuring that results are reviewed in a quick and efficient manner • Internal system of having a whole practice approach from receptionists, secretaries through to practice nurses that contribute to a GP obtaining results quickly.
Individual differences	• Personality was viewed through clinical performance and often within the context of referrals or been a cautious practitioner • Personality may have some influence on medical decision making and patient care via varied communication style • Participants also describe personality as; being 'nosy' or having a genuine interest in people or being a completer finisher.

9.3.1 Practice culture and structure

The research findings also introduced a wider perspective on general practice involving organisational culture, structures and processes which it is argued have a an important role to play in GP behaviours when recognising and referring for suspected lung cancer.

Over recent years within the NHS, programmes involving service redesign and organisational change have been developed and applied as levers to improve the quality of patient care and to address variation in patient cancer outcomes. General practice has also undergone significant change in recent years, as practice sizes and the workforce have increased and become more diverse with the expansion of services offered. These changes are primarily aimed to facilitate improved access and create greater choice for patients in order to reduce variation and improve quality. So, having set the scene as an organisational context for general practice the student will analyse findings regarding organisational culture and structure and how this interplays with the recognition and referral of suspected lung cancer. As described in chapter 6 section 6.5, key findings relating to practice culture and structure include the role of education and training, social structures, quality improvement and internal processes. It is posited by the student that these different facets create the fabric of the organisational culture and may be a factor in increasing quality in patient care. According to Hann et al. (2007) culture is identifiable as processes or levers that involve shared beliefs or values that may influence primary health care teams in the delivery of better quality health care and thus improve patient outcomes. Furthermore, Bower et al. (2003) suggests there are important relationships to be understood between team and practice structure, team culture and quality care outcomes. Working within the context of the student's findings there seems a compelling argument that practice culture plays an important role in the early diagnosis agenda and moves beyond the confines of the consultation room to support the recognition and referral of suspected lung cancer. However, the importance of the consultation is not to be underestimated as, according to the Kings Fund (2009, p. 2) "around 90 per cent of all NHS contacts take place in general practice as consultations. The consultation seeks to manage a pre-existing condition or to make an effective diagnosis of a presenting problem and may lead to a combination of advice, a prescription, treatment, or referral to a specialist". This simple percentage demonstrates the importance of the consultation in general practice. Furthermore, the RCGP (2013) describes the consultation model which GPs are currently trained, delivering 10-minute slots for all patients, as outdated. They argue that there is a growing evidence base demonstrating that longer appointment duration correlates with greater consultation quality. However, it is posited by the student that the recognition and referral of suspected lung cancer does not start in the consultation room but the consultation room is viewed as a facilitator that enables the GP to ascertain whether a particular action is needed with a patient. It is hypothesised that the medical decision making process begins with organisational culture and structures like those described in the data by participants which seem similar to those in educational practices where structured time is put aside for clinical updates and discussion of interesting or unusual case studies that can be shared amongst trainees, medical and clinical staff. It argued these clinical debates and discussion can arm GPs with new knowledge to ready themselves for those trickier more challenging presentations that can cause much introspection and self-reflection. It is these embedded organisational structures which involve dedicated and structured times for sharing and discussing clinical case studies that are viewed by the student as a facilitator for fostering general practice cultures in the adoption of new learning that may influence quality of care, via improved medical decision-making leading to earlier cancer diagnosis.

9.3.1.1 Practice internal processes

Within the literature there is some debate about health system delays and its impact on patient's quality of care. Whilst there is debate on this subject area the student has been unable to unearth large numbers of studies which suggest this field is inadequately researched.. As discussed in chapter 2 the study by Hansen et al. (2011) highlights system-related delay as waits for investigations are due to administrative procedures or poor logistics in the planning of investigations. The findings from the interviews highlighted the majority of participants recognise the importance of having efficient and effective internal organisational systems and processes to ensure that results are reviewed in a quick and efficient manner and reduce any system delay. Many of the participants seemed to recognise the implications if there were delays to the patient flow activity within the practice. Thus, having a whole practice approach involving secretaries, admin staff and practice managers through to clinical and medical staff to obtain results quickly is seen as important. Furthermore it is also recognising practice staff having clear goals and understanding of the importance of processes regarding efficiency and the potential implication to the patient, which links to the wider context of the culture of the practice. As stated by one participant:

….the culture of the practice, yes definitely, it does affect, when the chest x-ray report comes, I think if there is anything suspicious and they fax it that we should have a very good reception system, reception, but being, so that they can just bring it to the note of the GP and then so that it can be seen the same thing to decide whether they need an urgent management or not, so it's very vital that it's there, checking of, everybody needs to have an eye.HU11F.

The data suggest that having good internal systems and processes may be an influential factor in the diagnosis of suspected lung cancer. However, it is also noteworthy at this point to highlight there is a potential limitation to the data as three quarters of the participants were from an educational practice. Whilst these findings are important and underpin the qualities of an efficient and effective general practice that services local practice population well, what is less clear in the data is the detail of how the practice system processes operate. Thus, suggesting robust and rigorous internal processes maybe already in place. Understanding the variation in approaches within internal practice processes and how this influences the wider health system needs clarifying. It is suggested once this variation is understood it is to explore whether there is an opportunity to standardise these process which then could be offered and adopted in general practice. It is suggested that further research is needed in identifying if there is a model that could be developed to standardise internal general practice processes that withstands the scrutiny and rigour in obtaining results quickly which in turn could be then applied across general practice. It is argued that these aspirations in standardisation of internal general practice processes may contribute to reducing health system delay and delivering higher quality patient care. Working on this premise it is important we clarify the students working definition of quality in general practice which was posited by a recent report by the Health Foundation entitled Improving Quality in General Practice (De Silva and Bamber, 2014) which concluded that measures of quality are shaped by the target audience and the purposes for which they will be used, but frequently cover patient experience, safety and effectiveness. Furthermore, it is suggested by the student that embarking on this examination into standardisation contributes to the wider quality improvement agenda which is an important facet supported by the RCGP. According to RCGP (2013, p. 10) "GPs will be trained to have a better understanding of the needs of their practice population, which will inform capacity and workforce planning, as well as improve service quality………………….. Leadership and quality-improvement skills, delivered through enhanced and extended training programmes and national leadership and quality-improvement strategies for general practice, will encourage active participation in service redesign, and enable fundamental change". It is suggested that continuous quality improvement and increasing quality improvement skills in general practice as described above will establish a platform for the better evaluation of practice culture which will lead to creating the right environment in general practice to meet the needs of the practice population as well as the improve cancer outcomes.

9.3.1.2 Individual differences

Whilst some of the student's findings echo the literature it is suggested participants individual differences and their personal characteristics need to be analysed in detail and discussed within the context of their interactions and their environment. As discussed in chapter 3, section 3.2.1 it is suggested that GP-patient consultations are an embodied encounter in which GPs have to extract details from patients that go beyond salient features and critical cues to enable formulation of a clinical hypothesis and a clinical management decision. It is posited by the student that this encounter relies on the personality and individual differences of the GP to firstly, establish a rapport and listen to patients concerns to obtain relevant and the most appropriate information and secondly, to formulate a clinical decision for either continued management or to be referred at the earliest opportunity. Personality traits and individual characteristics are of particular interest to the student. The responses relating to personality were often described through the lens of clinical performance and referrals. This seems a curious perspective which warrants further discussion. From the students perspective it is of interest to understand why the majority of participants verbalised their own individual characteristics within the context of clinical performance and not something more attributable and personable to the way they interact, feel behave which is more aligned to the definition described in chapter 6 section 6.5.5 which is:

> “Enduring dispositions and tendencies of individuals to behave in certain ways. Personality is not a single thing. Instead, personality refers to a spectrum of individual attributes that consistently distinguish people from one another in terms of their basic tendencies to think feel and act in certain ways. The enduring nature and consistency of personality characteristics are manifested in predictable tendencies of individuals to behave in similar ways across situations and settings”. (Ones, Viswesvaran & Dilchert, 2005b, p. 390)

It is difficult to give a definitive answer as the research study’s main focus was not on personality and individual characteristics but on a broader agenda in understanding factors that influence GPs and the questions posed to participants within the context of personality were just a small part. It is posited by the student that the primary care context and changing climate at the time was influencing participant behaviours and perceptions which had become entrenched in performance measures as part of wider general practice culture which was driven by increased scrutiny from CCGs on referral patterns to support efficiency savings. It is also suggested this view of personality by participants is in relation to the escalation of litigation and complaints from patients which reflects why some participants may have characterised personality through the lens of been a cautious practitioner. Within the data litigation and complaints emerged unprompted from the first few interviews and was later included in the topic guide. What seems clear from the findings with participants is lung cancer and generally cancer per say evokes strong feelings within the context of litigation. As stated in chapter 6 section 6.6.3, litigation is a phenomenon that has become an increasingly accepted part of general practice which has ramifications for the medical profession as well and individually. As stated by one participant who highlights the severity of litigation:

There's lots of litigation with lung cancer.HU04M.

I think we've all moved into an increasingly litigious world where we do more and more tests and, you do wonder whether clinical discretion's part of it at times don't you.NL26M.

It is suggested by the student that that these perceptions by participants related to personality may relate to the seriousness of the complaint and the litigation process and how it may be related to the participants' individual differences and the affects it has on people in different ways. What the data does suggest is litigation is a facilitator in modifying behaviour but what is less clear is whether this is permanent or a short term change.

9.4 Academic contributions of the thesis and what it has added

My research findings have added to the existing literature in a number of areas and several important findings arise from this study.

Firstly, to the best of the student's knowledge this is the first study that obtains an in-depth GP perspective on the process of recognition and referral of suspected lung cancer. It has therefore given GPs a 'voice' regarding their role in a NHS system in which they are the gatekeepers to referral. What the study also adds is that although lung cancer is rare, participants in the study are reportedly thinking about it almost every day.

Secondly, the study has ascertained that the recognition and referral of suspected lung cancer is complex, confirming previous findings about the complexity of the recognition of lung cancer in general practice. The study findings highlight factors which help GPs understand what makes it easier to recognise possible lung cancer symptoms in patients. It has also identified barriers to the recognition and referral of suspected lung cancer in general practice. These facilitators and barriers include the focus participants placed on symptoms, context and patient factors within the consultation and also broader factors that involved organisational culture and structures that may influence participants in consultations.

Thirdly, the findings from the research interviews have provided potentially valuable insight into understanding the challenges and complexity of general practice and the difficulties that GPs face in the recognition and referral of patients who are possibly developing lung cancer. The research findings suggest that atypical presentations and comorbidities pose significant challenges for participants in determining lung cancer as a probable diagnosis. This is consistent with the literature as Mitchell, Rubin et al. (2013, p. 38) state “coexisting disease may mask symptoms of malignancy”. However, the findings also suggest that participants had a high awareness of red flag symptoms associated with lung cancer and demonstrated compliance with the NICE lung cancer guidelines through their verbalisations and decision-making within the think aloud clinical scenarios and the open-ended interviews.

Fourthly, safety-netting was sometimes discussed within the context of litigation and complaints which were an unexpected theme for the research student. This suggests that participants at times associated litigation and complaints with safety-netting. It is worth highlighting within the discussion of safety netting it was unclear with participants whether this was perceived as a ‘system delay’ or ‘patient delay’ as there is an assumption from some of the participants that the patients: 1) would return promptly for the results within the appropriate time frame, though there is the potential of an increased risk of what could be perceived as ‘patient delay’, and 2) that patients have the ability to obtain an appointment within an appropriate time frame, a situation more susceptible to ‘system delay’. However, the data collected showed that the majority of the participants did recognise the importance of having good access but many perceived their own practice as not experiencing access issues. This anomalous position of access to appointments being recognised as important while the majority of participants did not report experiencing access issues poses an interesting challenge, both within this study and within the literature.

Finally, from a methodological perspective, while other studies have examined GP decision-making and some within a cancer context (Stopler, Van de Wiel et al. 2011, Summerton, Rigby et al. 2003), to the exploration of decision-making regarding potential lung cancer symptoms has created new and valuable insights such as knowledge of NICE compliance and the emphasis placed on symptoms, patient factors and contexts that influence GP decision-making. The think aloud method relies on participants' verbalised cognition and so seeks to identify their clinical acumen enabling the student to obtain a rich understanding of GP decision-making. As described in the summary of chapter 8 the findings from the think aloud method emphasised the focus participants placed on symptoms, context and patient factors in the development of a clinical hypothesis. It was then a process of seeking to prove or disprove a hypothesis by working through a list of differential diagnoses and complexity within the time constraints and context of the consultation.

Additionally, this research has challenged the default position amongst the majority of studies which tend to focus on the disease and clinical aspects of lung cancer recognition and referral often through the lens of a positivist paradigm. Rather, this research has examined the problem in its broadest context and viewed the research problem beyond the parameters of the medical context but also as a culturally embedded phenomenon, signifying how participants' personal practice may be influenced by the organisational culture and structure of a practice. It is argued that participant behaviour may be linked to the context in which it resides. The re-engineering of culturally embedded behaviours via organisational development may be part of future research and interventions. This may involve cultural and behavioural change which goes beyond the scope of the medical context within which the recognition and referral of lung cancer is so often examined. The cultural and behavioural change approaches may involve the implementation of certain characteristics and structures that may be more pronounced and established in teaching or training practices such as daily, weekly and fixed learning and development opportunities. These characteristics may consist of the re-organisation of internal structures that facilitate a regular learning, sharing and dissemination culture as well as contributing to robust internal processes which this research strongly suggests should become standardised and be incorporated into every GP practice's organisational fabric.

9.5 Limitations and strengths of the research

It was noted in chapter 5 that the two methods chosen for this thesis were inextricably linked and were best placed to answer the research questions posed and to obtain the data. It was argued that the methods would establish valuable insights and ensure rigour, transparency, credibility and trustworthiness throughout the academic process. This thesis addresses all these points and brings new insights to add to the existing body of research. However, it is important to moderate the research contribution and discuss its potential limitations.

9.5.1 Limitations to the research

One of the main limitations to the research was the implementation of the think loud clinical case scenarios and the open-ended interviews within the same one hour time frame. The cause of this, in main, was due to the limited resources available and a realistic view that GPs would not have the capacity to take part in two separate interviews and to take 2 hours out from their busy schedule. As a result of these potential challenges a pragmatic approach was adopted with the session starting with the four clinical case scenarios before moving on to the open-ended interviews. Having participants verbalise their cognitive processes for the clinical case scenarios and following with the open-ended questions does, however, increase the risk of bias for the open-ended interviews. The four clinical case scenarios were focused on participants' medical decision-making involving patients with respiratory symptoms which would create a pre-cognitive awareness of the forthcoming open-ended discussion which might have altered the responses to the subsequent discussion about lung cancer. One of the key findings from the open-ended data suggests knowledge of lung cancer symptoms was high amongst participants. The high awareness of lung cancer symptoms was also consistent with the think aloud findings and so it could be argued that this particular finding may have been influenced by the methods and the implementation of the interview schedule in which the think aloud case scenarios were presented first and then the in-depth interviews were conducted.

The main limitations to the think aloud method were the development of the four clinical case scenarios. Overall, the scenarios may reflect too great a risk of a positive diagnosis and it may have been better to include one or more scenarios with less serious symptoms. On reflection, while the development of the clinical scenarios was underpinned by the literature and NICE guidance and were designed based on complexity, differential diagnosis and a context of believable reality, the findings indicate a CXR referral was central to each scenario, which suggests that the scenarios were set with too high a risk factor. However, these findings seem to be consistent with previous research on the management of patients within a lung cancer context and in particular the findings by Ellis and Vandermeer (2011).

The role of the interviewer within the think aloud process is to remain objective and allow participants to verbalise their cognitive process without influencing the process. The research student’s only role in the process was to prompt participants to speak their thoughts as on some occasions participants would internalise their thinking and decision-making and forget to verbalise their cognitive processes. Therefore, it could be argued that the student had limited influence on the method’s implementation, thus creating a unique data set in its purest form. The student had to demonstrate a high level of restraint when applying think aloud and request participants to only verbalise their cognitive thought processes without any further discussion or interaction. Finally, other limitations for the think aloud method using clinical scenarios was a risk that it does not eliminate any sense of theatre, artificial context and competitive traits projected by participants.

The participants who gave up their time to be interviewed mostly self-selected, volunteering to be interviewed. This may influence data findings as it is very hard to know how many were your ‘typical’ GP. This could be viewed as unavoidable and a challenge to qualitative research. It also may be argued that the self-selection of participants would lead to the sample leaning more towards those with an interest in the topic area, thereby affecting results. It was noticed late within the recruitment and data gathering process that large cohorts of participants were from either a teaching or a training practice. To try and reduce this potential bias a specific recruitment drive for non-educational practices was implemented and additional participants were recruited from those practices. This meant in the latter stages of the data gathering a number of potential participants from an educational GP practice who responded to the student’s recruitment request were not asked to take part in the research. It may be argued that part of the recruitment bias was partially due to the initial involvement of the Northern and Yorkshire Primary Care Research Network (PCRN) facilitators. A discussion of and the limitations to their involvement are highlighted in chapter 4, section 4.8, but it appears that their role and their relationship to practice managers may have led to practice managers adopting a potential gatekeeper role and restricting access to potential participants. The student was also made aware that access to GP practices via the PCRN facilitators was only to research practices, thus creating potential implications for interpretation of the data and how transferable the findings are with other practices. However, to try and alleviate this problem the student also sent out a large amount of individual letters to locality-wide GP practices to further help with diversity in recruitment.

The interviews with GPs were retrospective and as such are at risk of recall bias. It could be argued for example, that participants' experiences of challenging and unusual presentations may have been fixed within their psyche as these could be viewed as 'the one they missed', thus distorting the significance of the theme involving salient and challenging features.

Being the sole researcher and the sole data gatherer means there are limitations to the reliability of the research due to the interpretation of findings and difficulty in replicating the interviews. However, the double coding of many interviews and the analysis and interpretation presented in this thesis being overseen by the student's supervisors who are academic GPs with extensive experience in research ensured rigour in the research process and the minimisation of any potential researcher bias. Furthermore, as stated earlier in chapter 5 section 5.7 the student states his position as an interpretive constructivist and so follows a constructivist paradigm which aims to understand multiple social constructions of meaning and knowledge and from that construct the reality (Robson, 2002). Within an interpretivist perspective this recognises that people attribute meaning to behaviour and are authors of their social world rather than passive objects (Bryman, 2001), therefore the student's interpretation and analysis of the data can be viewed as part of the process that accessed a deeper understanding into the participants' social reality.

Additionally, it is important to highlight there is a limitation to data when considering social factors with participants. The study highlights participants' social factors in Chapter 6, section 6.2, but the student purposefully avoided focusing on expanding the discussion around social factors within the study in favour of a focus on understanding more about participant's individual differences and their psychological factors. Whilst it is important to recognise that both social and psychological factors of GPs are relevant within the context of recognising and referring for suspected lung cancer within this study, the decision was taken by the student not to explore and examine the social factors in detail. The study's focus on psychological factors was due to the student's personal interest in GPs individual differences and personality and to assess whether psychological factors had any bearing on participants' decision-making behaviour in the recognition and referral of suspected lung cancer.

Finally, the research presented in this thesis has limitations with regards transferability as the participants were only recruited from one geographic area in the north of

England. Due to this, the findings may lack transferability and generalisability to other parts of England and further research involving other national geographic locations is required to establish if the findings are more widely applicable. However, in defence of this, much effort was sort to reduce this limitation and whilst participants were recruited from one large location in the north of England their GP practices covered varied locations, geo-demographics and patient practice profiles.

9.5.2 Strengths of the research

One of the main strengths associated with the research findings lies with the application of the two methods that were chosen in order to answer the research questions posed. It is also the first study as far as the student is aware to investigate the views of GPs regarding the recognition and referral of suspected lung cancer in any depth. Two different methods were used for the research study presented in this thesis with the aims of identifying factors that influence GPs in the recognition and referral of suspected lung cancer and to understand GPs decision-making processes within a lung cancer context. These methods are viewed by the student as inextricably linked due to the nature to the research questions being posed and as such aim to give additional rigour and enhance further understanding to both sets of findings. The assimilation of the data allows for triangulation of results, where triangulation, as stated by Mays & Pope (2000, p. 51) "compares the results from either two or more different methods of data collection / the researcher looks for patterns of convergence to develop or corroborate an overall interpretation". Much of the literature relating to qualitative methods acknowledges the dynamic and interactive process and exchanging nature of the researcher and the researched. Thus, the student's methodological approach, interpretation and analysis of the data can be viewed as a way of understanding the social realities of GPs and the factors that interact with those realities in the recognition and referral of suspected lung cancer.

As described in chapter 5 both methods will form part of the triangulation of the research findings and help uphold its credibility and trustworthiness. Firstly, open-ended interviews are viewed by Barbour (2003) as the gold standard of qualitative research. This approach enables the student to gain access into the participant's reality and establish understanding and meaning into individual behaviours. Furthermore, the findings derived from the open-ended interviews have shed new light on the current literature involving the potential role of culture and organisational structure. The majority of findings from both methods are consistent and seem to corroborate and strengthen the conclusions drawn from each. In Addition, some of the findings seem consistent with studies in the literature (Ellis and Vandermeer (2011).

The other strength associated to the research study is the diversity of participants recruited from different localities and not just from one specific site or geographic area. The study parameters were to recruit from urban and semi-rural practices to examine if any differences or patterns emerge from the data. While the data suggest there was little variation between urban and semi-rural participants in decision-making, the student would argue the strength in the findings from the recruited participants from different geographic locations help minimise any bias compared to a study focusing on either a single practice or one geographical area. It could be argued that the diversity in geography strengthens and increases the generalisability of the research findings.

9.5.3 Student reflexivity

As described in chapter 5 section 5.4.2, reflexivity requires a demonstration by the researcher that they are aware of the socio-cultural position they inhabit and how their value systems or ideologies might influence collection and analysis of data (Grbich, 1999). Failure to assert a reflexive position does invariably create complexity to which the researcher, research study and data are questioned in relation to truth value and reliability. With this in mind, the student was very conscious of retaining a reflexive position throughout the interview process and questioning his own impact on each interview episode and on the relationship between student and participant as well as the effectiveness of the data collection. The student reflected on a number of undocumented accounts of post-interview discussions with participants which suggested that for some participants partaking in the research, the interview process could be viewed as a facilitator for individuals to reflect on their own practice and thus potentially affect their behaviour. Whilst this may be an unintended consequence of research participation it is suggested that each interview episode could be viewed as an ‘intervention’ given the nature of the questions posed, the clinical case scenarios that were presented and the additional probing.

More significant for the reflexivity of this research was the impact on the student’s previous professional career and experience. Having spent 18 years working in the NHS which included working at a senior level across local, sub-regional and national NHS organisations within a high-performance culture in change and service and health improvement, the student’s positionality was startlingly different to the cultural and clinical norms of those working in general practice. Whilst his own positionality didn't prepare him for the differences, the student did become more empathetic to the challenges faced by participants over the period of data collection and more conscious and aware of his own entrenched NHS management traits. This awareness allowed the student to retain a reflexive perspective throughout the data collection process.

It was a conscious decision by the student to consider how his own clothing might function as part of the data collection process, and to try and visually align to participants' psychological processes and purposively attempt to alleviate any potential barriers and establish rapport more quickly. The student embarked on a process of consciously dressing in semi-casual clothing and what the student viewed as stereotypical clothes of what an academic might wear in an attempt to address participant's potential preconceptions.

9.6 Reflective account of the student's research journey

As I have said in my acknowledgements I am struck by the distance I have travelled in the three and half years it has taken me to complete my thesis. In this time I have had the opportunity to establish the seeing, being and doing of a robust piece of academic research. As a practitioner working within health-related behaviour change and quality improvement arena in the NHS my original goals when embarking on this academic journey was to obtain new skills and knowledge to further my professional practice as a practitioner involved in change. I feel I have achieved this as my recent re-entry back into the NHS has allowed me to apply my new-developed skills using qualitative methodology in the work place to inform and develop improvement strategies across parts of the NHS. This area of development for me has been particular rewarding as a recent improvement strategy I designed and implemented in a large Acute Trust in the North East of England involved observational methods and gathering data through field notes within an Oral Surgery and within a Head and Neck Cancer Multidisciplinary Team. The process also involved interviewing all members of that team to help inform development strategies to reduce the 62 day breach targets which were an engaging and a positive process for both parties.

The impact on my personal thinking has been particularly strong as I have been exposed to the depth and robustness of the academic process, and had the opportunity to reflect and discuss ideas with peers, fellow students and supervisors at length and in detail which as a practitioner sadly is often an unrealistic and unachievable process within the pressures of performance and delivery at the NHS coal face.

Whilst reflecting on my time within an academic context it was for long periods an uncomfortable journey due to the readjustment to a full-time academic culture and unique and unfamiliar nuances a medical school brings. This was very much in contrast to working in a high performance culture within service improvement and change management in the NHS. What is of value is I am now able to reflect on the strength of my entrenched traits developed over time working within a NHS performance and management culture and take a step back, observe, understand and make more informed decisions when working with others either in the academic or the change and improvement arena.

9.7 Implications and recommendations

The following sections will consider the potential implications of the research findings for policy and practice and consider recommendations for future research examining factors that influence GPs in the recognition and referral of suspected lung cancer. It will also offer suggestions on how the research findings can be applied to change interventions and service improvements within health care related to the recognition and referral of suspected lung cancer.

9.7.1 Implications for policy and practice

The current policy for the improvement in cancer care is Improving Outcomes – A strategy for cancer. The strategy encompasses different public sector organisations from Public Health, NHS and Social Care with the emphasis on improving survival rates in cancer. Its focus is to save 5000 lives in 2014-15 to reduce the gap in survival rates as measured against other European Countries. The government's national public health organisation – Public Health England – has seen major investment in recent years in campaigns to increase public awareness on the signs and symptoms of cancers and encourage earlier presentation to their GPs. Whilst recent "be clear on cancer" campaigns have achieved some success in terms of awareness and the increase in presentation of patients to doctors (Cancer Research UK, 2014) additional evidence for improved outcomes of lung cancer still remain unclear. Other preventative strategies involving smoking remain at a local and also national level and retain a high profile; however, lung cancer incidence and mortality still remains stubbornly high compared to other cancers. There has been significant investment over recent years to address the disparity of lung cancer mortality when compared to other cancers, with limited success. While lung cancer looks set to remain a challenge for public health experts in the foreseeable future the findings from this research thesis will hopefully provide a compelling argument for the development of interventions that look at the broader context of lung cancer diagnosis and consider factors which are directly and indirectly related to the disease itself. As discussed in detail in chapter 2 section 2.8.1 the literature describes factors that fit within three main themes influencing the outcomes of lung cancer. These involve the patient, clinician and health system factors. In an attempt to tackle the stubbornly high prevalence of lung cancer and its perceived poor outcomes a number of strategies could be devised from the findings from this research thesis. One of the key findings highlights a high awareness of red flag symptoms and a suggested compliance of NICE guidelines. From this we may infer that there was no knowledge deficit amongst participants, is an important finding given that recent rhetoric from the UK Secretary for State of Health, Jeremy Hunt, on a strategy to improve cancer survival rates suggested that "GPs with a poor record of spotting the signs of cancer could be publicly named" (BBC News, 2014). The underpinning message from the Government may suggest GPs are not fully compliant with symptom recognition of cancer, however, in defence of general practice this thesis presents findings and evidence from the literature which highlights the complexity of cancer diagnosis and the difficulties GPs face, notably the volume of patients and presenting with unusual or atypical features and comorbidities that can mask a more sinister disease. Whilst the student is in favour of interventions that increase the early recognition and referral of cancer and specifically lung cancer, there is concern with the emerging thinking from government about naming GPs who miss signs of cancer. The implications for such an intervention could be far reaching and potentially result in some GPs becoming more defensive in their practice to counter any government scrutiny and risk of litigation from patients. This may have implications for secondary care capacity and the potential of further delays in the health system and treatment for more needy patients.

As the thesis findings have suggested, litigation was a key theme to emerge within the discussion and something the majority of the participants were both aware of and had some experience of, in some cases leading to their modifying their own behaviour and the behaviour of others within the practice. However, what is not clear in the data was whether this was a permanent or a temporary modification of behaviour. To further advance the discussion supported by the findings from this thesis a possible solution that may ameliorate the potential implications of the government's current thinking would be to devise a strategy for the development of additional educational training to involve all general practice in the UK. This training would consider atypical and challenging presentations for the majority of cancers that are proven within an evidence base to be viewed as complex and difficult to diagnose due to symptoms being vague, insidious, unusual and challenging. The suggested intervention which would be informed by the evidence base and relevant strategies that bring about professional behaviour change could be supported by policy either locally, via the CCGs, nationally using the Quality Outcomes Framework (QOF), or via revalidation to enable the intervention to reach all corners of general practice and, most importantly, to enable it to be adopted and become embedded in practice. To help further facilitate adoption and sustainability a suggested intervention involving regular audit and feedback could be carried out via CCGs to analyse trends of atypical and challenging presentations to further develop training and enable practices to become agile in creating a continuous improvement culture. The current evidence for audit and feedback as a strategy by Ivers, Jamtvedt et al, (2012, p. 2) states "audit and feedback generally leads to small but potentially important improvements in professional practice. The effectiveness of audit and feedback seems to depend on baseline performance and how the feedback is provided". Furthermore, it is suggested the development and pilot of a number of larger scale interventions to standardise organisational structures and internal processes such as obtaining results quickly which may facilitate the increase in quality in general practice. It is suggested that behavioural and cultural change may occur by developing standardised organisational structures and practice which replicate characteristics similar to those of teaching and training practices. Whilst the research student recognises this would not be an easy process due to the complexity and variation across general practice it is argued the pilot interventions would help inform and gain a deeper understanding to implementing important improvements in quality in general practice but also allows for further understanding of its impact on patient care within the referral and recognition of cancer. It is viewed by some participants that teaching and training practice characteristics deliver higher quality care and act as a facilitator in the development of a sharing and learning culture and receptive to new knowledge. This organisational culture may have implications for increasing quality in patient consultations, thus improving symptom recognition and referral in suspected lung cancer. Bower, Campbell et al. (2003) suggest important relationships are to be understood between team structure, practice structure, team climate and quality care outcomes. Their study which involved postal questionnaires and medical note audits concluded that "practice structure predicts process and that structure and process predict outcomes” (Bower, Campbell et al., 2003, p. 277). Similarly, Bosch, Dijkstra et al. (2008) examined quality of diabetes care found some marginal associations between quality of care and organisational culture. Other studies focused on culture, climate and team work within primary care have had varied results. A study by Hann, Bower et al. (2007, p. 323) found culture, which they defined as “a pattern of shared basic assumptions”, to have no association with quality of care and climate to have limited association. What is interesting from the student’s perspective is the literature highlights the majority of studies measure climate and culture using instruments such as Team Climate Inventory or Competing Values Framework which sit within a positivist paradigm and relate to predictive values.

Finally, it is important to highlight that since this research study was conducted the National Institute of Clinical Excellence Lung Cancer Guidelines have changed and have been updated in late 2015.

Table 9.2: Summary of 2011 and 2015 Lung NICE Guidelines

2011 NICE Guidelines	**2015 NICE Guidelines**
An urgent referral for a chest X-ray should be made when a patient presents with: Haemoptysis, OR any of the following unexplained persistent (that is, lasting more than 3 weeks) symptoms and signs: • chest and/or shoulder pain • dyspnea • weight loss • chest signs • hoarseness • finger clubbing • cervical and/or supraclavicular lymphadenopathy • Cough with or without any of the above features suggestive of metastasis from a lung cancer (for example, in brain, bone, liver or skin).	Urgently refer for lung cancer or mesothelioma (appointment within two weeks) in patients with: Chest X-ray findings that suggest lung cancer or mesothelioma OR Patients aged 40 and over with unexplained haemoptysis. **Consider** Consider an urgent chest X-ray (to be performed within two weeks) for lung cancer or mesothelioma in patients aged 40 and over with any of the following: • Persistent or recurrent chest infection • Finger clubbing • Supraclavicular lymphadenopathy OR persistent cervical lymphadenopathy • Chest signs consistent with lung cancer or pleural disease • Thrombocytosis.
An urgent referral should be made for either of the following: • persistent haemoptysis in smokers or ex-smokers who are aged 40 years and older • a chest X-ray suggestive of lung cancer (including pleural effusion and slowly resolving consolidation). Immediate referral should be considered for the following: • signs of superior vena caval obstruction (swelling of the face and/or neck with fixed elevation of jugular venous pressure) • Stridor.	**Offer** Offer an urgent chest X-ray (to be performed within two weeks) to assess for lung cancer or mesothelioma in people: • Aged 40 and over if they have never smoked with 2 or more of the following unexplained signs or symptoms listed below OR • Aged 40 and over and have previously smoked with 1 or more of the following unexplained signs or symptoms listed below OR • Any age if they have ever been exposed to asbestos and have 1 or more of the following: – Cough – Fatigue – Shortness of breath – Chest pain – Weight loss – Appetite loss.

Table 9.2 highlights the comparison in the two versions of lung guidelines. Whilst it is difficult to differentiate between both due to changes in style there are some clear changes. The removal of the 3 week time frame from the new guideline is most notable. There are other more subtle changes in relation to the wording. For example to use the word 'consider' creates a more ambiguous statement for general practitioners to navigate in the 2015 version, whereas the introduction of the word 'offer' has a call to action and clear parameters. The new guidelines also describe some additional symptoms which have not previously mentioned, these include appetite loss, shortness of breath and fatigue. What is also notable and missing from the new version is shoulder pain.

To summarise, it is difficult to consider what impact the new guidance may have had on the research findings and whether the think aloud and the interview data would be significantly different. However, the student predicts there will be a period of uncertainty and lack of clarity for GPs as they start to adopt new the NICE guidelines in the coming months and years.

9.7.2 Implications for future research

The implications of this thesis for future research lie within a number of areas. This thesis has built on previous literature by examining factors that influence GPs in the recognition and referral of suspected lung cancer. It is suggested further research is required to support the reliability and credibility of the thesis findings. A research strategy could be developed by applying the same topic guide and questioning within the open ended interviews but with some additional development of the think loud clinical scenarios considering the level of risk to a variety of GP practices factoring in more diverse practice populations and a broader socio-economic status. Other factors could be considered which involves different recruitment strategies of practices and the application of teaching and training status, size of practice, GPs experience across different geographic locations throughout England. The augmentation of the research would include additional researchers to establish rigour and generalisability within the research findings. It is proposed the additional research could be compared and triangulated to examine its trustworthiness and credibility. The triangulation of findings is of particular importance as it adds robustness to the thesis claims, especially when considered within a broader context. Furthermore, the augmentation of a future research approach may seek to further examine its key findings and in particular GPs high alertness regarding lung cancer and their compliance with NICE guidelines.

This research direction is of particular importance as it may provide some utility at a national level and provide practitioners and strategists clarity on whether there is any variation in the knowledge deficit about lung cancer symptoms and NICE compliance amongst GPs. This would allow practitioners and strategists to focus resource and efforts on more pressing challenges that still remain within the recognition and referral of suspected lung cancer.

In addition, it would be of particular significance to the literature if future research considered ethnographic techniques and in particular those that involve observation. If resources allowed, video cameras could capture a ‘fly on the wall’ perspective which could be supplemented by a researcher taking up a working position in the practice to take ‘field notes’ and achieve greater insight into the processes involved. This might provide useful data in learning more about the culture, the dynamics and processes that could potentially unearth new factors in general practice which influence the early diagnosis of cancer. Robson (2002, p. 186) states “ethnography provides a description and interpretation of the culture and social structure of a social group”. This would allow further exploration using qualitative methods and supplement the in-depth interviews and clinical case scenarios in gaining a rich and nuanced description of general practice cultures and organisational mechanisms that may have been disguised or masked by the theatre of the think aloud scenarios and in-depth interviews. The student believes further research is needed in examining climate and culture and considerations of more complex research design that may involve qualitative and quantitative approaches to enable a richer understanding of the nuances of organisational cultures and climates and also to examine what people were actually doing within general practice. I am still to be convinced that the use of positivist instruments provided in much of the literature when examining climate and culture are sufficient to understand fully the complex organisational facets that make up individual general practices. It is argued by the student that the concept of culture should also be examined and explored through the lens of an interpretive constructivist and allows a qualitative paradigm to gain a deeper, richer understanding of individuals, their environment and broader social context that facilitates the development and evolving nature of an organisational climate and culture. Whilst the literature highlights general practice climate and culture is often measured using positive instruments such as Team Climate Inventory or Competing Values Framework the student argues that both methodologies should be considered in future research.

Additionally, further exploration within other cancers is advocated to see if there are any similarities or differences with research findings. This would help support further understanding and help identify an ideal culture for the recognition of potential cancer symptoms which can support GPs in the recognition of complex cases.

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Appendices

1. Practice Characteristics

GP exp <10 yrs >10 yrs	GP Gender	SES of Practice	Rural/Urban	Training* Teaching* Practice	Location
>10	M	AFFLUENT - POCKETS OF DEPRIVATION	SEMI RURAL	TRAINING	EAST RIDING
>10	M	DEPRIVED	URBAN	TEACHING	HULL
>10	M	MODERATELY AFFLUENT - POCKETS OF DEPRIVATION	URBAN	TRAINING	HULL
<10	M	DEPRIVED	URBAN	NO	HULL
<10	F	AFFLUENT - POCKETS OF DEPRIVATION	SEMI RURAL	TRAINING	EAST RIDING
>10	M	DEPRIVED	URBAN	NO	HULL
>10	F	AFFLUENT -POCKETS OF DEPRIVATION	SEMI RURAL	TEACHING	EAST RIDING
>10	M	DEPRIVED	URBAN	TEACHING	HULL
<10	F	DEPRIVED	URBAN	TEACHING	HULL
>10	M	DEPRIVED	URBAN	NO	HULL
<10	F	DEPRIVED	URBAN	NO	HULL
>10	M	AFFLUENT - POCKETS OF DEPRIVATION	SEMI RURAL	TEACHING	EAST RIDING
<10	M	AFFLUENT - POCKETS OF DEPRIVATION	SEMI RURAL	TEACHING	EAST RIDING
>10	M	AFFLUENT - POCKETS OF DEPRIVATION	SEMI RURAL	TEACHING	EAST RIDING
<10	F	AFFLUENT - POCKETS OF DEPRIVATION	SEMI RURAL	TEACHING	EAST RIDING
>10	F	AFFLUENT - POCKETS OF DEPRIVATION	SEMI RURAL	TEACHING	EAST RIDING
<10	M	DEPRIVED	URBAN	NO	HULL
>10	M	DEPRIVED	URBAN	NO	HULL
>10	M	DEPRIVED	URBAN	NO	HULL
>10	F	DEPRIVED	URBAN	TEACHING	HULL
>10	M	DEPRIVED	URBAN	TEACHING	NORTH YORKS
>10	M	DEPRIVED - POCKETS OF AFFLUENCE	URBAN	TRAINING	HULL
>10	F	DEPRIVED	URBAN	TEACHING	HULL
>10	F	DEPRIVED –POCKETS OF AFFLUENCE	URBAN	TRAINING	HULL
>10	F	DEPRIVED	URBAN	TEACHING	NORTH YORKS
>10	M	AFFLUENT	RURAL	TRAINING	NORTH LINCS
>10	M	AFFLUENT	SEMI RURAL	TEACHING	NORTH YORKS
>10	M	MIXED SES	URBAN	TRAINING	NORTH YORKS
>10	M	MIXED SES	URBAN	TRAINING	NORTH YORKS
>10	M	AFFLUENT – POCKETS OF DEPRIVATION	SEMI RURAL	TRAINING	NORTH YORKS
<10	F	AFFLUENT – POCKETS OF DEPRIVATION	SEMI RURAL	TRAINING	NORTH YORKS
>10	F	MIXED SES	SEMI RURAL	TEACHING	NORTH YORKS
>10	M	MIXED SES	URBAN	TRAINING	NORTH YORKS
<10	F	MIXED SES	SEMI RURAL	TRAINING	NORTH LINCS
<10	M	DEPRIVED	URBAN	NO	NORTH LINCS
>10	M	MIXED SES	URBAN	NO	NORTH LINCS

*Teaching = Medical students *Training = Training doctors

2. Coding framework

Codes	Sub-codes
Triggers to presentation	Symptoms Other triggers (e.g. media, family)
Challenging presentations	Atypical symptoms (e.g. Lump on chest, Shoulder pain) Presenting with trivialities or trivialising lung cancer or vague symptoms Co-morbidities masking symptoms
Patient factors	Smoking Occupation Age Previous illnesses – co-morbidities - chest disease Family influences Deprivation Social Economic Status - Social class
Patient attitudes/response to symptoms	Emotional response (e.g. Fear, Denial) Personality traits (e.g. Stoicism, Fatalistic, patients lying, fear of being judged)
Referral	Access to diagnostics e.g. CXR Logistics - distance diagnostics
Consultations	Burden of lung cancer Burden of chest symptoms Time
GP communication	GP - patient relationship Patient centred consultation Meeting patient expectations
GP factors	Thinking about lung cancer Personality types and GP individuals characteristics GP attitudes/cultural awareness Experience Emotional response (towards patients)
Modifying GP behaviour	Complaints, error, defensive practise Patient and family behaviour Team input
GP decision making	Using intuition – gut feeling Use of guidelines Visual clues Patient symptoms and patient characteristics (age, smoker) Complexity of diagnosis in general practice Ethical decision making High index of suspicion
Practice factors	Access for patients Having good internal systems (e.g. Reviewing results) Practice culture – teaching/education/sharing cases Continuity of care Practice reputation amongst patients
Secondary care factors	Delay due to access to consultants Detached relationship amongst secondary care consultants
Policy and commissioning	CCGs commissioning Influencing inequalities via GP commissioning / Health Boards What primary care can do
Comparisons with other illnesses	

3. What are the factors influencing GPs in the diagnosis of lung cancer: Topic guide

CONSULTATION RELATED FACTORS

How often do you think about or consider lung cancer when patients present to you

Tell me about the last patient you can remember diagnosed with lung cancer – how she/she presented, and the role of primary care in the diagnosis.

Within a consultation context, describe the situations in which you would consider the possibility of lung cancer and explain what actions that may ensue.

What are the most challenging aspects of reaching a lung cancer diagnosis?

PATIENT FACTORS

Are there particular patients in whom you are more likely to think about lung cancer diagnosis? What sorts of patients, situations etc?

Are there patient factors, which make the diagnosis easier/harder?

- Why do you think the patient presents at a particular time what do you think is the trigger?

PRACTICE/GP FACTORS

How do you think primary care impacts (or could impact) on lung cancer diagnosis?

To what extent could practice related things impact on the diagnosis of lung cancer? (e.g. organisation, facilities, culture, location) Which might be the most important?

Do you think any particular aspects of GPs themselves might impact on the process of diagnosis (modifiable habits like experience, age, seniority etc)? If so, which aspects and how might they impact and are they modifiable?

In your experience, what do you think are the main facilitators that help you diagnose lung cancer?

Please describe what you think are the barriers for you in diagnosing lung cancer?

How do you think lung cancer diagnosis could be enhanced in primary care?

Lung cancer statistics can often look depressing, what is your experience of lung cancer outcomes and what is the typical disease pattern?

EXTERNAL FACTORS

What about contractual or policy issues – how may these impact on lung cancer diagnosis?

- A screening programme for over 45 years old who have a history of smoking would this be attractive and achievable to GPs?

Finally, is there anything from what we have discussed today that you would like to add further or feel you have missed from earlier discussion?

4. Participant consent form

H·Y·M·S
THE HULL YORK
MEDICAL SCHOOL

CONSENT FORM

Title of project: What are the factors influencing GPs in the referral and recognition of suspected lung cancer.

Name of Researcher: Spencer Robinson

Please initial box

1. I confirm that I have read and understand the information sheet for the above study and have had the opportunity to ask questions.
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason.
3. I agree to take part in the above study.

Participant name ______________________________

Participant signature ______________________________

Date ______________________________

Researcher Signature ______________________________

This project has been reviewed and approved by the Hull York Medical School Medical Education Ethics Committee.

HYMS Study Reference Number

Abbreviations

2WW	Two week wait
ASR	Age Standardised Ratio
COPD	Chronic obstructive pulmonary disease
CXR	Chest x-ray
CT	Computer Tomography
DoH	Department of Health
EBUS	Endo-bronchial ultrasound
ENT	Ear Nose and Throat
FCE	Finished Consultant Episodes
GP	General Practitioner
LUCADA	National Lung Cancer Audit Database
NAEDI	National Awareness and Early Diagnosis Initiative
NHS	National Health Service
NICE	National Institute of Clinical Excellence
NYCRIS	Northern and Yorkshire Cancer Research Information Service
OPD	Out-patient department
PET	Positron emission tomography
SEA	Significant Event Audit
YHSHA	Yorkshire and the Humber Strategic Health Authority
UK	United Kingdom