

**IMPROVING THE QUALITY OF NURSING CARE: A STUDY OF  
NURSING ERRORS AND THEIR REDUCTION**

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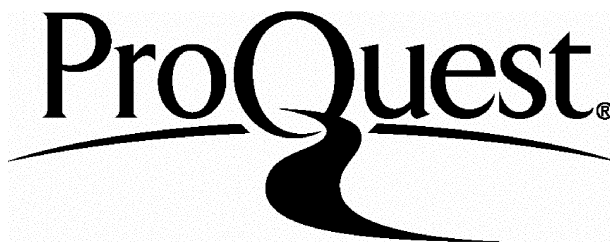
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**To Marnie, Christopher, Annabel, my Dad (Arnold) and Mum (Marie-France):**

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## **ABSTRACT.**

Errors and adverse events are common in clinical practice, and have a significant impact on quality and safety issues. They are also a major source of complaints and litigation. However, the study of errors in nursing (apart from medication errors) has been a neglected area of research enquiry. As a result, very little is known of the interaction between professional, contextual, organisational and psychological factors in the production of errors and in their prevention.

A series of studies were carried out to investigate the antecedents, types, and incidence of errors as well as nurses' responses to them, principally to identify the types of strategies that may be most effective in reducing errors in nursing care.

Using a critical incident technique, the types of errors that were made by nurses and their responses to them were investigated. These were found to occur at various stages of the nursing process. Accepting responsibility for one's error was linked to constructive changes in their practice.

The frequency of omissions in the assessment records of patients with chest pain was then examined. The assessment records were found to be very superficially completed and to contain a number of important omissions. When these omissions were compared with nurses' reported omissions, a wide discrepancy was observed. Nurses not only reported significantly less omissions but also attributed their causes mainly to external factors such as job overload rather than internal factors such as lack of knowledge or experience, although they could achieve only 50 % of the expected score in a recall test on chest pain. This may be because they may not have considered these omissions as errors. When they were presented with scenarios describing 'real' errors, they tended to attribute their causes predominantly to internal factors.

On the basis of these findings, a system of care pathways was implemented for patients admitted with chest pain to ascertain whether this structured approach to care would be effective in reducing omissions in assessment and care of these patients. The results showed significant improvement in the assessment records of the patients as well as a positive impact on various clinical indicators, including better awareness of patients' needs and improved patients' satisfaction.

The results of these studies have implications for the management of errors in nursing and for improving the standard of care given to patients. The evidence suggests that a system approach should be used both for investigating errors in nursing and for reducing their incidence.

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## **CHAPTER ONE: INTRODUCTION.**

Nursing is at a critical stage of its development as a profession. There have been concerted attempts in the past two decades or so to establish a firm knowledge base for nursing, to demonstrate its unique contribution to health care, and to enhance its status as a burgeoning profession.

The Briggs' (1972) recommendations that nursing should become a researched-based profession was undoubtedly a major landmark in the history of the nursing profession. It created the momentum for nurses to start carrying out research into nursing care during the 1970's and to start building a knowledge base for the practice of nursing. This emphasis on developing nursing knowledge has been the main thrust of the many changes which have been introduced in nursing in the past few decades, culminating in the replacement of the certificate hospital-based course in nursing to an all diploma course (UKCC, 1986) taught at universities and colleges of higher education.

In the climate of rapid changes, finite resources and public demands for better health services, the issue of quality and safety has become fundamental to the practice of nursing and the other health care professions and audit has now become an integral part of all aspects of health care.

### **1.1 The context of nursing.**

To fully understand current practice, it is important to examine some of the events and changes which have played a key role in shaping modern nursing. Many of the changes which have been implemented in nursing have either been influenced by outside agencies or been imposed by management. Even fundamental aspects of nursing such as the nursing process and nursing model have their origins in management and nurse education rather than practice areas. This lack of involvement by clinical nurses in decisions relating to their own



work makes it rather difficult for them to fulfil their aspirations to function as fully fledged autonomous professionals who are in control of their own work. It is against this backdrop that one has to view some of the difficulties experienced by nurses in the delivery of care.

## **1.2 The development of nursing.**

The beginning of the nursing profession is thought to be about the end of the 19th century. However, what or who influenced it is more debatable. Some reformers such as Bedford-Fenwick (Maggs, 1985) claimed that it was Florence Nightingale who established a trained nursing profession. Others (e.g. Burdett) saw the emergence of General Nursing as inextricably linked with the growth of the general hospital system (Maggs, 1985).

The legal definition of a nurse originated with the Nurse Registration Act (1919). The law defined only the State Registered Nurse (i.e. one who had been registered with the General Nursing Council by virtue of having followed a prescribed training course). This means untrained people could still call themselves nurses, "provided the impression was not given that 'nurse' means State Registered Nurse" (Baly, 1982). This led Bedford-Fenwick (Maggs, 1985) to argue that the public had a right to know "what was a nurse, what duties and responsibilities she had...". Bedford-Fenwick postulated that the training of nurses should be geared towards instilling a rigid code of behaviour and discipline. The acquisition of knowledge and skills was not considered as important. In fact, interest in nursing knowledge and research is a relatively new phenomenon.

During the interwar years, there was little development in the nursing profession. But the demands of war time forced the government to address the problems of nurses supply and distribution, and no doubt enabled nursing to progress "within

a more uniform framework of planning and administration" (Dingwall et al, 1988). The formation of the National Health Service (NHS) in 1948 consolidated this trend.

However, there was no logical or consistent pattern of participation of nurses in policy matters (Dingwall et al, 1988). The introduction of the Salmon structure (1966) was a serious attempt to modernise nursing management and to give it more opportunities in determining hospital policies. The flaw in the Salmon structure was "the progressive dilution of nursing by the development of low level staff to carry out many of the less technical aspects of personal care", with more qualified staff being lost to management and education (Dingwall et al, 1988). This was rectified by the introduction of clinical grading structure in the 1980's, aiming to keep expertise at clinical level and increase the standing of the profession (see appendix 1 for explanation).

With the implementation of the Griffith's report (1983), nurses lost most of the influence they had gained as a result of previous reforms. The Griffith's report led to the transformation of the old NHS administrative structure to one of efficiency-oriented management. Professional general managers were appointed at every tier of NHS to promote local decision making. As only a negligible number of nurses were appointed to these managerial positions, their influence on policy matters were markedly reduced.

The importation of managerial models from the business world into the NHS have had other important effects. Nurses were constrained by cost consideration of any changes they want to implement in their profession. For instance, the UKCC envisaged 70 percent of nursing care being delivered by trained nurses, but management expected minimally trained support workers to play a bigger role (NHS Training Authority, 1987). The commitment of management to

introduce a complex mixture of personnel within the clinical areas is illustrated by the following statement:

*Nurses sometimes perform duties simply because they happen to be on the spot, the various contributions and roles of other groups need to be taken into account in building up a complete picture of the staffing functions in an environment such as the hospital ward.*

(Institute of Health Service Management, 1997).

### **1.3 Quality and Safety in Nursing Care.**

In line with current developments in the medical profession, nursing is being increasingly subject to quality assessment. It is now a requirement that nurses and other healthcare staff should audit the care they give to their patients as a result of the government white paper "working for patients" (1989). Morrison (1991) argues that the fundamental aim of audit in nursing should be to "foster in nurses a critical questioning approach to their activities and the needs of their patients".

There is certainly a growing pressure for health care professionals to reduce variations in the delivery of care (Crombie et al, 1994). The concepts of clinical effectiveness, clinical appropriateness and evidence-based practice have become very important in professional clinical practice. Increasingly, health care professionals have to cope with other pressures such as the mismatch between demands and resources as well as the growing pressure of consumerism (Crombie et al, 1994). All of these developments have brought professional practice under the microscope, requiring health professionals to be more open, critical and accountable for their practice.

To provide quality and safe care, it has also become important for the profession to ensure that its members' current level of knowledge and skills is adequate for

the tasks they have to perform. This idea that nurses must keep abreast with changes in their practice and continuously update themselves is enshrined in the Post Registration Education and Practice (PREP) legislation, which came into effect from April 1996. This requires nurses to show evidence of professional updating before they are able to renew their registration at the end of every three years. PREP is based on the assumption that pre-registration education does not give the nurse all the knowledge that she/he needs to practice for the rest of her/his professional life. It is based on the current educational philosophy that learning is lifelong. The rapid technological change in various spheres of life, and especially healthcare, means that much of what is learnt has a finite and shrinking life. This means that nurses must continually acquire a higher level of knowledge, skills and understanding in order to be able to continue to practice nursing in a safe and effective way, particularly as there have been concerns that some nurses may not have been 'refreshing' their knowledge following their initial registration or on their return to nursing after a break and that this may jeopardise patients' care.

There has also been other parallel developments to improve the system within which nurses have to work to reduce risk in the delivery of care. For instance, it has been recommended ( DOH , 1993 ; UKCC , 1992 ; UKCC , 1994; UKCC, 1996) that all nurses should have the benefit of supervision not only to ensure good practice and prevent patients from being harmed but also to enable proper targeting of their professional development needs and helping them to develop their skills and knowledge . The UKCC (1992) has also published a document entitled ' The scope of professional practice ' to be used by the nurses as a framework for developing practice and meeting the needs of the patients and clients. It focuses upon six principles, namely :

- \* putting the needs of patients and client first at all times
- \* updating and developing your knowledge, skills and competencies

- \* recognising limitations in your personal knowledge and skills and taking actions to address these deficiencies
- \* ensuring that you do not compromise standards of care by new developments to your practice and taking on new responsibilities
- \* acknowledging your own personal professional accountability
- \* refusing tasks for which you are not competent.

The UKCC (1996) particularly stresses that professional accountability is an integral part of professional practice. In fact, each clause of the Code of Conduct (see appendix 1) begins with the statement that :

*As a registered nurse, midwife or health visitor, you are personally accountable for your practice and, in the exercise of your professional accountability, must....*

According to the UKCC(1996), accountability provides the principles to help the nurses in their decision-making process, enabling them to weigh up the interests of patients in complex situations, using professional knowledge, judgement and skills to make decisions about care. Thus nurses are expected to ensure that they do not harm their patients in the process of giving care and to exercise professional accountability for their actions. Since accountability means being able to explain why an action had been taken or an event took place, knowledge is essential to enable the nurse to make this explanation (Bernard and Chapman, 1988). Thus, the issue of accountability is intimately linked with competence. To be competent means that the nurse has the knowledge and skills to function safely and take responsibility for his or her professional development (Elliott Pennels, 1997). Paradoxically, the increased professional status of nurses and its concomitant expectation of accountability has made it more likely for nurses to be sued personally for their negligence. This explains the growing interest in the liability insurance cover provided by the Royal College of Nursing (RCN) for its

members, and the tendency by nurses not to rely entirely on the liability insurance provided by the health authorities for their staff.

#### **1.4. The regulatory rules.**

Nurses deliver care to their patients within a legal and ethical framework to ensure that risks to patients are minimised and patients' rights are safeguarded. The United Kingdom Council for Nurses, Midwives and Health Visitors (UKCC) is the statutory body which governs the work of the nurses. It was established by the Nurses, Midwives and Health Visitors Act (1979). The act states that the "principal functions of the central council shall be to establish and improve standards of training and professional conduct". The UKCC exercises its power by ensuring that the public is served by well-trained and conscientious nurses, who will be able to give them safe and quality care, particularly through its requirements that nurses have to undergo a prescribed course leading to the acquisition of thirteen core competencies (UKCC, Rule 18A,1989 -see appendix 1) and its code of professional conduct. Achievement of these competencies will enable the nurses to become "knowledgeable- doers", i.e. they will have the knowledge and skills to provide competent care to their patients.

Through its professional code of conduct, the UKCC has the power to apply appropriate sanctions to those nurses who are found to be seriously incompetent, negligent or grossly irresponsible. The ultimate sanction is the removal of one's name from the register of nurses, thereby removing the person's right to practise as a nurse.

The Code of Professional Conduct for Nurses, Midwives and Health Visitors (UKCC, 1992) provide the nurses with an ethical framework for their practice, ensuring the patients best interests are taken into account at all times. The Code

was established as a result of section 2 (5) of the Nurses, Midwives and Health Visitors Act (1979) which states :

*The powers of the council shall include that of providing, in such manner as it thinks fit, advice for nurses, midwives and health visitors on standards of professional conduct.*

The "code" is a professional and ethical guide for every nurse. It sets out the norm of acceptable professional behaviour. Pyne (1990) argues that the "primacy of the interests of the patient or client" is the principle theme of the code. The nurse is not only expected to act in the best interests of the patient but also be accountable for the care she/he gives to the patient. The care must necessarily be of high standard. Thus, judgement in "misconduct" cases is based on standard which is implicitly stated in the code.

#### **1.4.1. Concerns about standard of care.**

Recently, the UKCC (1996) has expressed concerns about the growing rate of professional misconduct cases, particularly from the nursing home sector. The UKCC is of the view that many of these cases highlight inappropriate delegation and inadequate supervision. It also found that "a significant number of cases reflect incompetence, rather than professional misconduct..." , and that there may be a need to examine the feasibility of developing procedures to deal with the "poor performer". However, focusing solely on the "poor performers" may not necessarily lead to an improvement in care and general performance. Rather, we should look more widely at the causes of poor care as well as the circumstances which are associated with poor care.

Macara (1993) also argues that serious mistakes are common in the NHS, and many factors may be contributing to this increase, including working "under increasing pressure that too often becomes unbearable". Similarly , the Health

Service Commissioner regularly reports his concern about serious "short-comings" in patient care and management and about the failure of healthcare staff to address these issues constructively. In his 1986-1987 reports, he unveiled a catalogue of nursing errors which he claims to be due to failure of nurses to fully understand the nature of the nursing process and its application to care. We need to know why nursing staff have difficulties with certain aspects of the nursing process as well as the type of measures that are needed to improve the situation.

### **1.5. The reporting of errors.**

Although the available literature indicates that errors and therapeutic misadventures affect a substantial percentage of hospitalised patients, almost all studies suggest that significant errors are under reported (Perper, 1994). The major culprit for the under reporting are thought to be due to the secretive methods by which adverse events are internally handled in hospitals (Perper, 1994). With respect to nursing, it can also be argued that the reluctance to report errors may be partly due to the fact that "erroneous action" has not been labelled as such and partly because of uncertainty inherent in health care practice. Fear of repercussions may also influence whether a particular action is considered erroneous or not (Arndt, 1994). For instance, depending on the perception of the supervisors, in "two similar cases with identical outcomes, one person may be considered guilty of an error while the other person is blameless" (Bosk, 1979). This apparent uncertainty about the nature of errors may not only affect the level of reporting of errors but also make it less likely for all incidence of errors to be properly investigated.

In nursing, few statistics are kept on errors, with the exception of reported medication errors. By and large, errors in nursing tend to be tackled by disciplining the nurse who is thought to be responsible for the error and recording the incident in the nurse's personal confidential file. The record is then deleted



after a set period of time. As a result most information on nursing errors are inaccessible to the investigators. More serious errors are reported to the UKCC, which can be accessed. But this form of reporting does neither reflect the actual incidence of errors nor provide information about the range of errors that occur in nursing. This may be due to the fact that the criteria for reporting errors to the UKCC are not entirely explicit or are not strictly adhered to. In addition, we have to contend with the natural reluctance of nurses to report their errors, particularly where they fear they might compromise their image or their career (Arndt, 1994).

It is natural that nurses and the other health professionals do not want to be seen as incompetent or negligent. They are primarily motivated by the ethic of "do no harm to patients". They want to be seen as responsible and trustworthy professionals who have the welfare of their patients at heart. Indeed, Arndt (1994) found that the need to be seen as competent, skilful and to be respected by the general public is very important for the nurses' self-image. Making errors is anathema to being considered as a good nurse. This might explain not only the nurses' reluctance to admitting to their own errors but also their tendency to judge harshly those colleagues who have made errors (Arndt, 1994).

#### **1.6. Dealing with errors and inadequacies in clinical practice.**

Leape (1994) argues that the "professional cultures of medicine and nursing typically use blame to encourage proper performance". The assumption is that errors are always due to someone's fault, caused by lack of attention or caring or wilful negligence. Thus, prevention of errors tends to take two forms: punishment and training. Punishment tends to be in the form of peer disapproval or formal discipline whereas training is used to ensure that people do the right thing. In nursing, training focuses on instilling rigid adherence to rules and in medicine the emphasis is less on rules and more on knowledge (Leape, 1994).

The tendency to focus on blaming individuals for errors in nursing and medicine is purely a reactive approach to the management of errors and is unlikely to prevent or reduce further errors. Rather, there is a need to gain better understanding of human error mechanisms in clinical practice as well as the impact of the structures and systems on the performance of health professionals.

### **1.7. Conclusion**

Nurses and other health care professionals aim to give quality and safe care to their patients or clients. Yet, our understanding of why this is not always achieved is quite limited, partly because of the reluctance of staff to discuss openly issues relating to errors and other inadequacies in care and partly because of the complexity of factors which have an impact on the delivery of care. The next chapter focuses on the various methods of care delivery in nursing care and concurrent problems.

## **CHAPTER TWO: THE DELIVERY OF NURSING CARE.**

### **2.1 Changes in the Delivery of Care.**

Over the past two decades, the delivery of nursing care in the UK has changed from a task-oriented approach to a more systematic and problem-solving method called the nursing process. More recently, various conceptual models of nursing have been developed to be used with the nursing process ostensibly to rectify some of the shortcomings of the nursing process. Further improvements include the use of clinical guidelines, care pathways and evidence-based practice. These various developments will now be discussed to demonstrate how nurses operate in the clinical environments in order to gain insight into the difficulties that nurses may experience in the delivery of care.

### **2.2 Task-oriented care.**

Task allocation is "a way of organising work into blocks which are capable of being performed by anyone of a given skill level" (Dingwall et al., 1988). With this system, specific and usually unrelated tasks are assigned to an individual nurse by the senior nurse. For instance, the care of patient with chest pain is broken down into a hierarchy of tasks, and each task is performed by a different nurse according to her/his skill and seniority level. The most junior nurse is allocated to perform the physical tasks such as washing the patient or helping him to use the toilet. The slightly more skilful or experienced nurse will have the duty of carrying out the 'observations' (e.g. Blood pressure, pulse rate, intravenous infusion etc.). A qualified nurse or more senior nurse is given those tasks perceived as being most technical such as cardiac monitoring and drug administration. Finally, the nurse in charge will write the nursing report on the patient to be used at the handover of shift. With this system no one has overall responsibility for the total care of the patient or has an overall perspective of the patient individual needs and problems.

### **2.2.1 Problems with the task system.**

The main flaw with the task-oriented system is the lack of a comprehensive or holistic assessment of the patient's needs and problems. Instead of an individual care plan for the patient, there is a list of "nursing orders" or instructions written down by the nurse in charge for different nurses to carry out for the patient over the course of the shift. This potentially makes the care less systematic in the sense that individual nurses attending the patient may not be inclined to focus on the inter relatedness of the patient's different problems, hence possibly overlooking significant changes in the patient's condition. This problem may be compounded by the inherent weakness of the task allocation system in not being able to foster continuity of care because of the daily changes in the assignment of duties and not having a nurse in charge of the patient himself/herself.

There were also concerns about the superficial nurse/patient relationships inherent with this task oriented care. With the task oriented approach to care, the patient had to relate to an array of nurses who may be more concerned with treating his condition and symptoms than dealing with him/her as a person. This was seen to be incompatible with the wider social movements of the time "which were based on a call for more holistic relationships between people" (Dingwall et al, 1988).

### **2.3 The Introduction of the Nursing Process.**

The advent of the nursing process, which is a holistic approach to care based on the individual patient's needs and problems, was considered as a convenient "umbrella" to initiate the necessary changes and improvement in nursing practice (Nursing Process Evaluation Group, 1986). As a result, during the late 1970's and 80's, articles extolling the virtues of the nursing process abounded in nursing journals. These articles were overwhelmingly "advocatory" in nature. A strong view was expressed that the nursing process was a tool to improve patient care

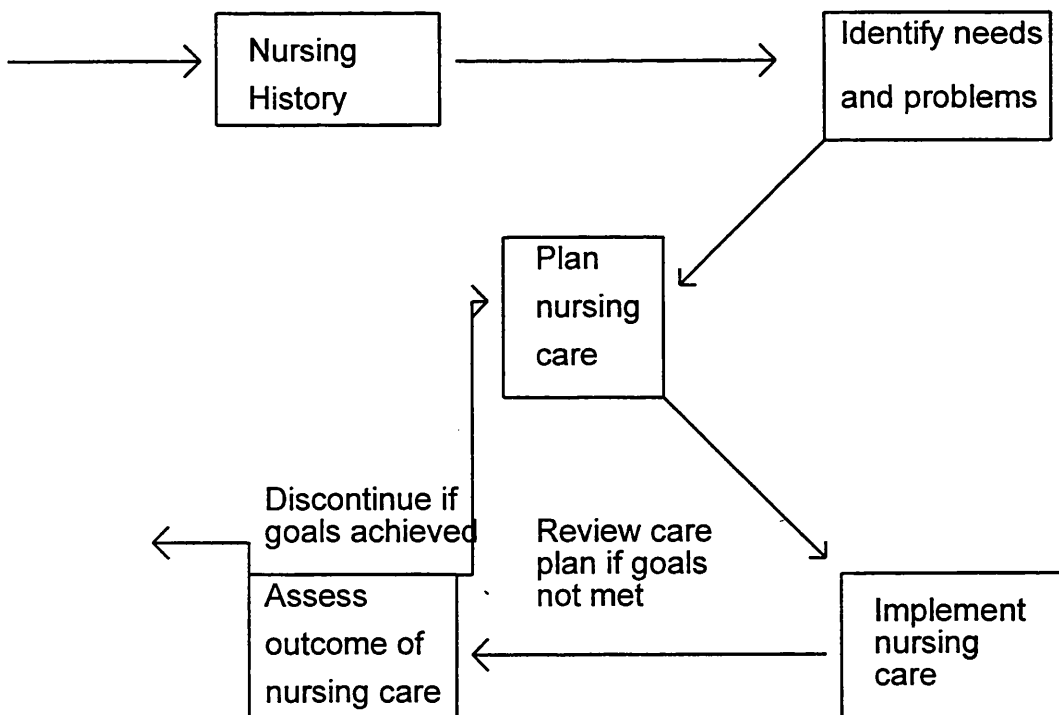
through the use of a more systematic and individualised approach. Surprisingly, there were hardly any confirmatory studies to support this view. In fact, the Nursing Process Evaluation Group (1986) conceded that very little was known about the ways patients reacted to this approach of care.

### 2.3.1 The Stages of the Nursing Process.

The nursing process is often described as a problem-solving approach to care consisting of four interlinking stages, namely assessment, planning, implementation and evaluation (Jones, 1977; Yura & Walsh, 1978; Hargreaves, 1985).

The four stages of the nursing process are shown diagrammatically in figure 2.1.

Figure 2.1 The Relationship between the four Stages of the Nursing Process.



Assessment involves taking a history of the patient's complaint as well as making appropriate observations and physiological measurements with a view to identifying the patient's specific problems. This is a difficult stage of the nursing process and its success is dependent not only on the skills of the nurse but also on how busy the ward is. If the nurse has multiple tasks to carry out, is stressed or lack knowledge and skills, the assessment may be inadequate and certain problems may not be identified. This in turn may affect the subsequent stages of the nursing process. For instance, if a frail and poorly patient is admitted to hospital and his pressure sore risk is not initially recognised, preventative measures may not be planned for and actual pressure sores may then develop.

Planning is intimately linked with assessment. Once the nurse has identified the patient's specific actual and potential problems as a result of the assessment of the patient, she or he will then set objectives about the desired outcome for each problem. In the example of pressure sore, the nurse will write down how the development of pressure sore could be prevented.

Intervention involves carrying out the care that has been planned. This is dependent on the nurses practical knowledge, appropriate delegation of duties, resources and general management of the ward. Failure to carry out the planned care may adversely affect the patient's care.

Evaluation is concerned with making a judgement, based on available information, on whether or not the objectives of care have been achieved. If a problem has not been resolved, the nurse will have to decide whether it is due to a poorly identified problem, inaccurate objective or inappropriate interventions. Thus, evaluation is an essential step that links structure, process and outcome (Donabedian (1988)).

### **2.3.2 Application of the stages of the nursing process to a patient with chest pain.**

To illustrate how the nursing process operates, the assessment and care of a patient admitted with chest pain using this system of care will now be described. On the admission of the patient, the nurse would first of all carry out a thorough assessment, encompassing an interview to determine the history of the chest pain and related factors, observations of vital signs as well as general observations and physiological measurements. This would enable the nurse to identify the patient's specific problems and needs as well (e.g. chest pain, low blood pressure, arrhythmias etc.) as prioritising them. Based on these problems and needs, a care plan would be designed with specific objectives for each problem and need (e.g. the chest pain will be relieved, blood pressure will return to normal, arrhythmias will be monitored). The care would then be implemented to achieve the objectives of the care plan. Finally, the patient would be re-assessed (i.e. the initial problems and needs would be evaluated to see whether or not they have been resolved) to ensure that the objectives of care have been achieved. A successful outcome would be the patient would be free of pain and complications, his basic needs and comfort would have been met during his period of illness ,and he would have been equipped with the knowledge to deal with some aspects of his care.

### **2.3.3 Problems with the Nursing Process.**

Various problems have emerged when the nursing process has been examined. For instance, there have been criticisms that the nursing process has caused a proliferation of documentation. The poor quality of these records has also been highlighted regularly by the Health Commissioner in his annual reports (DoH, 1992). Official reports (e.g. DoH, 1994; DoH, 1992) have commented on the excessive and inappropriate documentation which has affected communication between staff and has sometimes led to omissions or inadequacy in care. In the

nursing records' study sponsored by the Department of Health (DoH, 1992), it was found that "some patients were charted to death but there was no evidence of action and that day to day states were deficient". The study also recommends that nurses should be more factual and precise in their description of nursing observations. In a study of the records of patients admitted with Myocardial infarction, Hale et al (1997) found no evidence of assessment of needs with regards to anxiety and health education of individual patients. They found that in all cases, the records failed to satisfy the criteria outlined in the UKCC(1993) in their document 'standards for records and records keeping'.

The hasty introduction of the nursing process may have contributed to the difficulties with its use. The fundamental aspects of the nursing process such as intellectual skills, individual accountability, and patient participation were played down when the nursing process was first introduced in the UK (De La Cuesta, 1983). In 1986, the Nursing Process Evaluation Group commented that "the problems.....have been brought about by the lack of understanding of and negative perception towards the nursing process....coupled with too speedy introduction to an unprepared workforce". As a result, there was more focus on explaining the documentation associated with the nursing process than in enabling the staff to understand the principles underpinning the nursing process. This may explain the nurses' apparent difficulty in operationalising the nursing process at its broad theoretical level, hence the focus on paper work associated with the nursing process. Miller (1985) has also remarked that nurses have tended to concentrate more on the procedural (i.e. method) component of the nursing process and less on its ideological (i.e. principles and beliefs) component.

It was also suggested that nurses have problems in using the nursing process because it lacks the theoretical base to explain what nursing is. For instance, it is argued that nurses cannot achieve the goals of nursing through a problem-solving



approach (i.e. the nursing process) if they do not have a clear concept of "what the goals are and where the boundaries of nursing lie" (Wright, 1986). As a result some nurse theorists (e.g. Roper et al, 1980; Aggleton & Chalmers, 1985; Wright, 1986) have advocated the use of explicit "model of nursing" for use with the nursing process. They suggest that a model of nursing is a conceptual explanation of what nursing is and the relationships between the various components which make nursing. They argue that a model will provide the clinical nurses with a theoretical framework for use with the nursing process to make the principles underlying the nursing process more explicit.

#### **2.4 Improving the nursing process.**

Two major problems have been highlighted which prevent the effective use of the nursing process, namely nurses inadequate understanding of the principles underpinning the nursing process and the documentation "maze" generated by the use of the nursing process and models of nursing. Doctors have tackled the problems associated with the explosion in knowledge in the medical field and the concomitant inability for doctors to keep abreast with all the latest approach to manage specific medical conditions by introducing guidelines for medical practice (Brook, 1989) and critical pathways (Greenfield et al, 1977). Integrated care pathways are increasingly becoming popular in nursing too both in the USA and the UK. Earlier evaluations of the use of this system suggest that it may rationalise the nursing process and increase its effectiveness in the delivery of nursing care. Guidelines have the potential to make nursing documentation more precise and accurate, and could act like prompts to speed up nurses decision-making process in planning care for patients. Evidence-based practice can also be incorporated within guidelines or pathways.

### **2.4.1 Clinical guidelines and care pathways.**

Chassin (1990) defines practice guidelines as "statements that describe specific manoeuvres that should or should not be undertaken in specific clinical circumstances". Practice guidelines specify good management for specific conditions. They focus on quality of care and appropriateness of practice (Lomas et al., 1989). Kosecoff et al (1987) argue that guidelines can keep physicians up to date in the face of explosion of medical knowledge. Guidelines may help to reduce variations in care of patients, contribute to reducing errors, omissions or inappropriate care in clinical practice and assist in protecting the legal liability of the physicians (Fowkes et al, 1987). However, Lomas et al (1989) found that guidelines by themselves do not improve care. They state that other incentives or removal of disincentives will also probably be required. Koseloff et al (1987) recommend that guidelines be "coupled with follow-up programs that help to translate the message into local or individual actions...".

A critical care pathway is an extension of clinical guideline, and its obvious attraction is that it can be used by all members of the multi-disciplinary team, enabling an integrated approach to care. The critical pathway is an abbreviated version of the patient's management plan, showing the critical incidents that must occur if the patient were to achieve the appropriate length of stay (Zander, 1988). The critical care pathway demonstrates how the nursing process can be adapted to make it more efficient and effective. It also enables quality assessment of care to be made. For instance, the nurse co-ordinating the care of the patient can note and record any variances from the critical paths, explore their causes with the other nurses who have been involved in giving the care and arrange for specific action to be taken in relation to these variances (Gruiliano and Porrer, 1991). This system of care ensures that interventions take place at the appropriate point of the patient's stay in hospital and also help to avoid omissions in care. Gruiliano and Porrer (1991) argue that this model of care enables good communication to take

place between all those involved in the care of the patient and also promotes patient and relatives participation . The use of this approach to the care of patients with specific conditions may help to minimise the problems and confusion associated with nursing process which have been discussed earlier.

It must also be noted that carepathways/guidelines may complement and enhance individualised care, particularly as the identification and tackling of variances are integral to this system of care (Johnson, 1997).

## **2.5 Conclusion.**

It has been argued in this chapter that to fully understand the way nursing is organised and delivered as well as the difficulties that nurses experience in the process of care, we need to be aware of some of the salient factors which have influenced changes in nursing practice. Nursing has had a very unsettled history, with nurses having had to accept many changes in the way they deliver their care being imposed on them rather than being proactive in these changes. On the whole, nurses received little preparation to help them cope with these various developments in a competent manner, hence possibly making them less able to use the nursing process in a knowledgeable and confident way. Although the nursing process was initially hailed as an important development which would enable nurses to make that final push towards professional status and improved standard of care, its speedy introduction and the lack of consideration of its potential impact on the nurses have conspired to create a permanent state of unease with this system of delivering care, and is a potential source of many errors of omission and commission (Reid, 1987) . It is suggested that by modifying and simplifying the nursing process system of care by the provision of clinical guidelines/evidence-based health care and care pathways, much of the difficulty and confusion associated with the nursing process could be reduced.

In the next chapter, the types, sources and consequences of errors made by nurses and doctors in the delivery of care will be discussed. It will be suggested that nurses will need to become more aware of the antecedents of these errors if quality and safety in care are to improve.

## **CHAPTER THREE: ERRORS AND ADVERSE EVENTS IN HEALTH CARE.**

### **3.1 Introduction.**

Health care professionals are trained to be careful and competent at their job, and to ensure that they use resources effectively so that they can give care of the highest possible standard. But, given the complexity of health care and the high number of interventions that each patient may require as well as the number of health professionals that may be involved in carrying out these interventions, it is not surprising that errors and other problems occur, sometimes resulting in unintended injuries. Unfortunately, little attention has been given to the causes of clinical errors or to developing methods to prevent them. Leape (1994) has identified three main reasons as to why nurses and physicians have not developed more effective methods of error prevention. First, they may lack awareness of the severity of the problem. Second, most errors do not cause harm. Thirdly, the culture of clinical practice (i.e. to strive for error-free practice) makes it difficult for nurses and physicians to deal with human error when it does occur.

### **3.2 Nature and incidence of adverse events in medicine.**

An adverse event is "an unintended injury that was caused by medical management and that resulted in measurable disability" (Hiatt et al., 1989). With the notable exception of the confidential enquiries and critical incident studies, there are relatively few studies which focus on the incidence of iatrogenic adverse events in the United Kingdom. So, most of the evidence on adverse events in medicine in this chapter will be drawn from studies carried out in the United States and Australia, particularly the Harvard Medical Practice Study (Hiatt et al., 1989) and the Quality in Australian Health Care Study (McL Wilson et al., 1995). Both studies uncovered significant number of adverse events in retrospective clinical reviews of medical records.

To date, the Harvard Medical Practice Study is the most thorough and comprehensive investigation of adverse events in medicine that has been carried out. This study looked at a random sample of all discharge records (N= 30,429) in 1984 in 51 New York State hospitals according to pre-defined criteria which included death, increased length of stay, hospital re-admission, fever at discharge and complications requiring transfer to operating theatre or intensive therapy unit. It identified injuries sustained to patients during medical therapy and how many of them were the result of negligence. Of the 31,429 medical records examined, 1,133 (3.7 % of all cases) revealed an adverse event caused by medical treatment, 280 (27.6 %) of which were the result of negligence. When these findings are extrapolated to all patient discharges from New York Hospitals, the study concludes that for every 2.6 million patients discharged, 56,000 sustained injuries with minimal impairment, 13,500 with moderate impairment, 3,800 with permanent impairment, 2,500 with permanent and total disabilities and 13,400 with adverse events that caused death. The most common types of adverse events were found to be drug complications (19.4 %), wound infection (14 %) and technical complications. Risk factors included age, patients' condition, race, type of insurance and the hospital where care was given. There was a higher rate of adverse events in teaching hospitals, but lower rate of substandard care or negligence. This indicates that the rate of adverse incidents is influenced by severity of illness as well as the standard of care.

The Medical Practice study reveals that the incidence of adverse events is greater than is generally recognised. From the findings of the study, it was extrapolated that an estimated 1.3 million people each year in the United States received unintended injuries as a result of medical therapy (Leape et al, 1995). The study authors suggest that prevention methods should be directed at all adverse events and not just those that are negligent ( Leape et al., 1991).

A similar study was carried out in Australian hospitals (Quality in Australian Health Care Study, 1995), involving the retrospective clinical review of 14179 medical records according to 18 specific criteria (McL Wilson et al., 1995). The study reveals that 16.6 % (N= 2353) of admissions resulted in an adverse event, 51 % of which were considered preventable. This was considerably higher than the 3.7 % recorded in the Harvard Medical Practice Study. The authors of the Australian study argue that this may be because of the different focus of the two studies, the Harvard Medical Practice Study concentrating on negligence and the Quality in Australian Health Care Study on preventability. This may have influenced the level of reporting of adverse events. A second reason given for the higher incidence of adverse events in the Australian study was that the quality of medical records may have improved since the Harvard Medical Practice Study was carried out.

Thus, both studies indicate that adverse events are common in clinical practice and may lead to serious consequences for the patients. There were also many similarities in the findings of the two studies, particularly regarding the timing and nature of adverse events. If these figures are extrapolated to a British context, a medium sized hospital with 50,000 admissions per annum would have between 2000 to 8000 adverse events per annum each leading either to patient injury or to a longer hospital stay (Vincent, 1997). In England alone, out of approximately 5 million admissions per annum, some 200,000 adverse events occur, with 50,000 being due to negligence (Vincent, 1997).

### **3.2.1 Confidential enquiries on adverse events in medicine.**

In the United Kingdom, audit studies such as the confidential enquiry on maternal deaths (HMSO, 1986), the confidential enquiry into perioperative deaths (Buck et al., 1987), mortality associated with anaesthesia (Lunn and Mushin, 1982), and resuscitation of the severely injured in the accident and emergency

department (Dearden and Rutherford, 1985) have yielded valuable information on the causes and incidence of adverse events and substandard care. All of these studies have indicated that a significant proportion of deaths and other adverse events to patients were avoidable and have also identified areas where the care is substandard. Staff shortages, lack of consultant involvement, inadequate supervision, inappropriate delegation of cases, deficient case notes, surgeons operating outside their specialties and failures of communication have all been found to be prominent contributing factors to deaths and injuries to patients.

Maxwell (1984) argues that the confidential enquiries have been highly influential in directing medical attention to perinatal and anaesthetics deaths. There is no doubt that lessons can be learnt from these kinds of studies about the underlying causes of adverse events and how to reduce them. For instance, McDonald et al (1991) in their audit study of avoidable deaths from surgical intervention have identified some of the avoidable factors of deaths such as surgeons' competence, pulmonary embolism and pneumonia. This has enabled them to institute measures such as reiteration of policy, improving line of communication, giving an insight into the surgeons' weaknesses and further training, using prophylactic heparin therapy to tackle the high pulmonary embolism rate, and emphasising the importance of physiotherapy to reduce the incidence of pneumonia. to prevent further mishaps or oversights. However, the confidential reports would have been strengthened if more data were provided on the denominators of the adverse events. For example, Nixon (1992) argues that although the "Report of the National Confidential Enquiry into Perioperative Deaths 1990" reported that there was 58 wound dehiscence and 54 anastomotic failures associated with perioperative deaths, no information was provided regarding the total number of cases and the number of patients who survived these complications. The low compliance in supplying information to the "inquiry" also reduces the validity of the report. Nixon (1992) reported that "one

fifth of requests for information were met with silence and a further fifth yielded incomplete data. Whether this represents simple apathy, active resistance, or an attempt to conceal is unknown".

### **3.3 Errors in medicine.**

An error is defined as "an unintended act (either of omission or commission) or one that does not achieve its intended outcome" (Leape, 1991). In the Harvard Medical Practice Study, 69 % of the injuries were due to errors. However, since most errors do not lead to patient injury, the incidence of error in medical practice is likely to be much higher than the rate of adverse events. The incidence of medication errors, for instance, are high in patients admitted to hospitals, but most do not result in injury (Bates et al., 1995). McL Wilson et al (1995) argue that adverse events in health care "seldom arise from a single human error or the failure of one item of equipment, but are usually associated with complex interactions between management, organisational, technical and equipment problems". They found that system errors accounted for 16 % of adverse events, errors of omission were judged to have occurred in 52 % of them, and errors of commission in 27 %. The type of error could not be determined in 21 % of adverse events.

In the few studies (e.g. autopsy studies, house officers mistakes) that have looked specifically at errors, errors have been found to be very common. For instance, in a review of 50,000 autopsies of patients dying from one of 11 specific diseases (Anderson et al., 1989), the accuracy of a high number of medical diagnoses was found to be erroneous. Rates of 35 to 40 % of missed diagnoses causing death were discovered (Anderson et al., 1989; Goldman et al., 1983; Cameron and McGoogan, 1981). Anderson et al (1989) states that it is often "physician factors rather than patient factors that account for the great majority of missed diagnoses... with the misdiagnoses approximately evenly divided among errors of



omission and errors of judgement...", the most common cause of diagnostic errors being lack of awareness or alertness on the part of the physician.

In the autopsy studies, it was also observed that improvement in diagnostic technologies had not had an apparent impact on the accuracy of diagnosis. In fact, several studies have shown that doctors have problems in interpreting particular tests or using certain types of diagnostic procedures. Cooper, Newbower and Kitz (1984) claim that the increased sophistication and complexity of medical technology have made errors more likely to occur in its operation. Even with frequently used and relatively more mundane diagnostic technique such as X-rays, junior doctors working in accident and emergency department were unable to detect 35 % of radiographic abnormalities (Vincent et al., 1988). They also reported high rates of error in detecting signs of cyanosis, interpreting electrocardiograms, and assessing biopsy specimens. The most startling findings of errors in assessing biopsy specimens is the revelation that 42 patients in a bone tumour unit in a Birmingham hospital were misdiagnosed and received extensive unnecessary treatment (Milhill, 1993). Errors in cytology tests have also been widely reported in the press in recent months (e.g. The Times, 1998).

In a study of house officers' mistakes involving 254 house officers (Wu et al, 1991), it was found that the most common types of reported errors were errors of diagnosis (33%), prescribing (29%), evaluation (21%), communications (5%) and procedural complications (11%). The findings also revealed that there was serious outcomes in 90 % of reported cases of errors, 31 % of which were death.

### **3.3.1 Factors relating to errors in medicine.**

Adverse drug events (Brennan et al., 1991; Leape et al., 1991; Bates et al., 1993 ; Leape et al., 1995) and cardiac arrests are two major complications of iatrogenic

illness (Steel et al., 1981 ; Bedell et al., 1991). The type and frequency of identifiable factors associated with these iatrogenic injuries will now be examined as they might help us to understand the cause of errors in the care of hospitalised patients and also suggest interventions to reduce their frequency in the future.

The overall medication prescribing error rate over a 1-year study period in a 631-bed teaching hospital in New York was 3.99 per 1000 orders, giving a total of 2103 confirmed clinically significant medication errors (Lesar et al., 1997). The most common types of errors detected accounting for 81 % of all medication prescribing errors were dosing errors (both overdoses and underdoses), prescribing medications to which the patient was allergic and errors involving the prescribing of inappropriate dosage forms.

A large number of these errors were found to be due to lack of knowledge, inadequate access to patient's information, miscalculation of medication doses, mental slip and memory lapse (Lesar et al., 1997). In a study of errors causing adverse drug events, Leape et al (1995) also found that lack of knowledge, lack of information about the patient, slips and lapses were major proximal causes of errors, accounting for 22 % and 14 % of the 334 errors respectively. However, Lesar et al (1997) argue that it is not always easy to identify the true underlying cause of a medication error as identical errors may be caused by any proximal and underlying causes or by a number of causes. But, by focusing efforts on the factors which have been found to be associated with medication prescribing errors, the problematic areas of medication prescribing could be identified and the risk to patients from prescribing errors should be reduced.

In a study of 203 cardiac arrests in which resuscitation was attempted, 14 % of the arrests followed an iatrogenic complication (Bedell et al., 1991), which was defined as an "arrest that resulted from therapy or from clearly identified error of

omission". They found that the main causes of iatrogenic cardiac arrests were medications, procedures, and sub optimal attention to clinical signs and symptoms. Bedell et al (1991) suggest that 64 % of the iatrogenic cardiac arrests might have been prevented if the physicians paid more attention to the laboratory and clinical data prior to the arrest.

### **3.4 The problematic nature of nursing errors.**

Compared to medical errors, very little is known about the antecedents, types , frequency of errors in nursing practice. What constitutes a nursing error may also be opened to debate. Gallie (cited in Bosk, 1979) refers to errors as "essentially contested concepts", because the grounds for fixing the label "error" to any action are always arguable. What makes the definition of a nursing error so problematic? It can be argued that some objectives of nursing actions are not always precise or immediately obvious. For instance, Bosk (1979) argues that "precise, definitive interventions with very specific expectations make failure to achieve objective a more salient issue than in areas where interventions are diffused". Benner (1984) even contends that nursing is not amenable to decision making analysis because it is intuitive in nature. Senders and Moray (1993) suggest that "either an actor or an external judge needs a model of task performance to be able to decide whether an action has been correctly executed". For some aspects of nursing practice (e.g. administration of medicines), there are clear policies and guidelines. Any deviation from these may be immediately noticeable and labelling them as errors may not difficult. In fact, medication errors are the most widely understood errors in nursing practice. The "other" errors in nursing are at best haphazardly or ambiguously reported and at worse very much underreported. This may be due to uncertainty about their status. For instance, the use of cotsides to prevent a confused patient from falling out of bed may be considered as essential by some nurses but substandard practice by others.

### **3.4.1 Studies of errors in nursing.**

The vast majority of the limited literature on errors and adverse events in clinical practice relates to medicine. As yet, errors in nursing have not attracted similar level of interest, judging from the almost complete lack of empirical studies on nursing errors. Virtually all studies of errors in nursing relate to medication errors, and even then most of these studies tend to originate from North America. The longer history of nursing audit in North America, the more advanced nursing courses, and the different system of care may partly explain these differences in emphasis on the investigation of errors.

For the purpose of this thesis, a medication error is defined "as a deviation from the physician's medication order as written on the patient's chart" (Allan and Barker, 1990). The discussion will be focused mainly on North American studies because of the lack of valid quantitative medication error study from the UK. Although there may be some variations in the health care system between the two countries, there is broad similarities and consensus in the principle, purpose and method of administration of medication.

### **3.4.2 Incidence of medication errors.**

Most studies on medication errors indicate they are quite frequent in clinical nursing practice and are major causes of adverse events. For instance, when medication error rates across several hospitals in the United States were compared, it was found to range from 13 % to 18 % of all doses administered (Jesse, 1981). Robinson (1988) reported that in some hospitals medication errors rank second to only accidental falls in the list of adverse outcomes experienced by patients.

In a study involving 4031 adult admissions in medical and surgical units in two hospitals over a six months period using prospective data collection by nurses

and pharmacists and concurrent chart reviews by nurse investigators, Bates et al (1995) detected 247 adverse drug events (ADEs) and 194 potential ADEs. The crude rates of ADEs were 11.5 per 1000 patient-days and 6.1 per 100 admissions compared to the 0.7 ADEs identified in the Harvard Medical Practice Study. Bates et al (1995) argue that their particular approach of investigating ADEs was an attempt to overcome the inherent flaw with the traditional self-reporting approach which "severely limits the ability to obtain detailed information about individual events". They also suggest that previous studies on medication errors did not take a systems approach, relied too heavily on retrospective data and did not take near-misses into account.

An in-depth evaluation of a unit dose drug distribution system at a large hospital in the United States revealed an initial error rate of 9 %, i.e. 183 errors per 2018 opportunities for error excluding wrong time errors (Barker et al., 1984a). Fourteen recommendations were then made by the researchers to reduce the error rate, but the hospital fully implemented only two of them. When the study was repeated again two years later, Barker et al (1984 b) found no reduction in the error rate which they attributed to the partial implementation of the recommendations.

Girotti et al (1987) found only a 2.2 % medication error rate in an adult intensive care unit (ICU). During a period of approximately one month, each day the nursing medication administration record was compared with the physicians' orders to identify any error. Girotti et al (1987) detected 102 errors (2.2 %) in the dosing of 35 of the 60 patients surveyed. They attributed the low error rate to the one-to-one patient:nurse ratio in the ICU in comparison to a general medical or surgical ward where one nurse may be responsible for administering medication to several patients.

Medication errors can result in serious consequences to the patients. Several studies (e.g. Williams et al., 1983; Ireys, 1976; Buehler et al., 1985; Cooper & Long, 1982) have reported fatal occurrences following a medication error. Barker et al (1966) classified 66.1 % of 653 medication errors as serious. Medication errors can also lead to other consequences such as malpractice suits (Barker et al., 1984c) or extension of patients' stay (Garich & Saito, 1985). Thus, it is important that accurate information are obtained on the incidence of medication errors as well as the stage at which errors occur in order to reduce their impact on patients and to structure preventative measures. The actual audit of adverse and potentially adverse drug events as used by Bates et al (1995) appear to provide more accurate and useful information on drug-related incidents than studies using self report or retrospective charts review.

### **3.4.3. The reporting of medication errors.**

The actual incidence of medication errors cannot be easily gauged from reports of medication errors, principally because of lack of data kept by the hospitals on medication errors, the reliance of most medication error studies on self-report, and low compliance of staff to fill in an incident report when an error has been made. For instance, when anonymous reporting and reporting by incident reports were compared, a wide discrepancy was found (Francis, 1987). This is shown in table 3.1.

**Table 3.1 Errors reported by clinical area.**

<b>Clinical areas</b>	<b>Anonymou s reports Number</b>	<b>Incident reports Number</b>	<b>Percentage of total</b>
Surgical	338	25	6.8
Paediatric	121	16	11.7
Critical care & Emergency	48	5	9.4
Medical	16	5	24.0
Obstetrics/Gynaecology	15	2	11.8
Total	538	53	8.96

Source: Francis G (1987)

The under-reporting of medication errors detected in incident reports may be due not only to the reluctance of staff to report their errors, but also "incident reports require error awareness as a prerequisite for reporting" (Barker and McConnell, 1962). It is also argued that "direct comparison of error rates across studies should be made cautiously because of variations in error category definitions and methodologies" (Allan & Barker, 1990). For instance, Francis (1980) found that nurses were more likely to report a medication error if it had resulted from not adhering to the procedures relating to the administration of medicines than to situational factors. These difficulties affect the reliability of the results obtained in medication error studies which rely on self-reporting, and may also explain some of the ambiguous findings. Thus, what gets reported may represent only the tip of the iceberg (Francis, 1980). Moreover, many factors may militate against the reporting of medication errors, including fear of disciplinary actions (Walters, 1992).

#### **3.4.4 Types of medication errors made by nurses.**

The categorisation of errors is an important first step in the study of errors. Since the administration of medication involves following a set of rules (commonly referred to as the 5 R's, i.e. right drug, right dose, right time, right patient and right route), it could be predicted that the commonest types of errors that are likely to occur will be associated with some infringement of those rules, either unconsciously through slips and lapses or intentionally. In fact, most error categorisation take into account the policies and procedures relating to the therapeutic use of drugs (Allan and Barker, 1990). In their definition of a medication error, the American Society of Hospital Pharmacists (1982) includes several categories of error such as omission error, wrong dose error, unordered drug error, wrong time error, wrong route error, wrong administration errors and extra dose errors.

Forty-four percent of medication errors were wrong drug being given to patients, and 31 % were related to medications being given to the wrong patient (King, 1983). Giving drugs in the wrong dose may also be a serious problem, taking into account that 81 % of nurses were found to be unable to calculate drugs at 100 % accuracy (Brindler and Bayne, 1991). Conklin et al (1990) found that taking "short cuts" (i.e. deliberately not following the procedure) accounted for 31 % of medication errors in their study. The common types of medication errors found in three separate studies are shown in table 3. 2.



**Table 3.2. Common types of medication errors in three studies (values are given as percentages of the total).**

Types	Long & Johnson (1977) 75 errors	Barker & Heller (1964) 211 errors	American Journal of Pharmacy (1963) 93 errors
Wrong patient	1.3	13	
Wrong dose	33.3	38	21
Omission	17.3		37
Wrong drug	20	10	
Wrong time	16	10	10
Extra unordered drug			10
Wrong route	1.3		
Wrong rate	1.3		
Unordered drug		25	18
Duplication of drug	8		
Other	1.3	4	4

Source : Fuqua R. A and Stevens K. R (1988).

### 3.4.5 Causes of medication errors.

The action of an individual alone is never the solitary cause of a medication error incident - rather there are "causes, subcauses and contributing factors combine to cause an incident" (Blake, 1984; Fuqua & Stevens, 1988). The findings of most medication error studies indicate that several causes contributed to medication errors. For instance, Fuqua and Stevens (1988) found that inadequate knowledge or skills, failure to follow policies, failure of communication and personal factors as important variables in the causation of medication errors. They argue that successful administration of medication requires the possession of sound knowledge of the drugs, the patient's diagnosis and the purpose of the medication

therapy. Inadequate knowledge can lead to unsafe practice, such as the nurse who failed to give a cancer patient folic acid to counteract the adverse effect of methotrexate therapy because she did not find it important to wake up the patient to give him a "vitamin" pill (Davis et al., 1981). In a study of medication errors in Iowa hospitals (Long and Johnson, 1981), problems of communication accounted for 21 % of all medication errors. For example, if a nurse fails to document the omission of heparin, Newton and Newton (1977) state that the doctor may assume when checking the blood results that the drug was given and consider the dosage to be ineffective. This would lead him to increase the dosage which may then cause an adverse event such as excessive bleeding. The team work approach in health care may mean that mistakes made by one health professional may affect the performance of other health professionals within that team.

### **3.5 Methods of investigating errors and deficiencies in care.**

From the foregoing, it is evident that not much is known about nursing errors, but it is clearly important to study them if we were to increase the safety and quality of our care. For instance, Dudley (1974) proposes a systematic method of the regular collection, study and analysis of patients' data as such data can help "remedy deficiencies....evaluate clinical practices....contribute to clinical research....and is likely to benefit patients".

Methods used in auditing care and investigating errors and adverse events (including adverse drug events) in medicine and anaesthesia can be used to study nursing errors. These methods range in sophistication and complexity from single case analysis to broad epidemiological surveys involving analysis of data collected on thousands of patients. The diversity suggests that errors and substandard care in clinical practice need to be studied in a variety of ways according to the nature of the problem being investigated and also taking into

account that each method has its particular advantages and disadvantages. The different methods that can be used to study errors and substandard care will now be reviewed. In particular, the scope and limitations of each method will be given.

### **3.5.1 Occurrence screening.**

Occurrence screening is a type of retrospective record review and it used to review adverse events and poor quality care. It involves trained health care staff reviewing a series of medical records using a set of criteria to identify departures from good quality care. The criteria used may be incidence of adverse events, re-admission to hospital because of incomplete management, occurrence of pressure sores or nosocomial infection, unplanned return to theatre and cardiac or respiratory arrest. Crombie and Davies (1994) state that the rationale of occurrence screening is to identify "patterns in the data, simplifying the task of identifying the underlying reasons for deficiencies in the quality of care". This technique was used in the Harvard study in the USA (Hiatt et al, 1989) and provided a comprehensive picture of the quality of care in a number of hospitals in New York and identified the commonest types of adverse events that occurred in those hospitals as well as their consequences on the patients involved.

Vincent (1993) argues that as occurrence screening is a multidisciplinary approach, it is particularly effective at identifying issues with cross professional boundaries. It identifies clinically relevant events from the medical records and can provide targets for more specific investigation. Hale et al (1997) state that the data derived from records are unbiased, i.e. not influenced by the research question. Its main drawbacks is that it relies on the accuracy of the medical records and also does not take into account the outcome for the patient.

### **3.5.2 Incident reporting.**

The term "incident report" refers to the official written report of a medication error as documented by the hospital staff. This system of reporting of adverse events have been used in both the UK and the United States for many years. The "Joint Accreditation Manual for Hospitals" (1989) states that medication errors should be reported according to established written procedures, although it does not restrict the reporting method to incident reports. Incident reporting could be used for detecting errors or inadequacies in care or assessing their frequency. It could also be used for choosing cases raising concern to be analysed. Both in the UK and in North America, incident reporting is often used as a disciplinary tool, which limits its validity as an error detection method. Tribble et al (1985) contend that incident reports provide an ongoing reporting mechanism for an entire hospital and enable the quality of the drug administration system to be continuously monitored. Many studies however have shown this method to be unreliable. For instance, Barker and McConnell (1962) found that out of a total of 51,200 errors which may have occurred in a year, only 36 were actually reported by incident reports, which indicates a gross under reporting. One of the main reason for its ineffectiveness may be its association with the disciplinary process. Tribble et al (1985), Myles and Naeger (1987) and Shannon and De Muth (1987) all found that nurses were reluctant to document their medication errors for fear of disciplinary action.

### **3.5.3 Critical incident technique.**

A critical incident is "any untoward event or mishap- not necessarily harmful" (Williamson, 1988). With this technique, a large number of individual errors are analysed in depth to identify common causal factors. The critical incident technique has been applied in the study of errors in aviation (Flanagan, 1954), anaesthetics (Cooper et al., 1984), medication errors made by nurses (Safren and Chapanis, 1960) and intensive care (Wright et al. 1991). Flanagan (1954)

described this technique as a procedure for collecting observations of human behaviour and is aimed at the solution of practical problems. In the context of clinical practice, the term critical incident means "an episode of patient care in which the actions of a physician had specific beneficial or detrimental effects on a patient" (Anon, 1988). The critical incident technique is thought to be a positive way of analysing errors as it focuses more on monitoring practice and prevention than on substantive negative outcome (Cooper et al., 1984 ; Williamson, 1988). In fact, Williamson (1988) believes that this technique is very useful to investigate "the relatively large, and to date mostly untapped submerged body of errors that do not cause harm to patients". In a study of medication errors using this technique, Safren and Chapanis (1960) were able to catalogue and describe the common types of errors made by nurses in the administration of medication and to analyse their causes. They were also able to recommend ways of making the medication system safer and more efficient.. Cooper et al (1982) used critical incident technique to investigate the factors that predispose anaesthetists to make mistakes and to identify the circumstances which are likely to lead to errors. They found that deficiencies in knowledge was an important factor in a number of adverse events and suggested that anaesthetists should receive in-service training about new drugs, procedure and equipment.

There are advantages as well as disadvantages associated with this method. Allan and Barker (1990) suggest that this method is eminently suitable to allow subjective data regarding types of errors that occur in clinical practice and their perceived causes to be collected and analysed, and Williamson (1988) argues that it does not focus just on adverse incidents and substandard care, but it also monitors all aspects of care as well as prevention of incidents. The main drawbacks of this method are the inherent difficulties in the interpretation of the data and the multiple sources of bias (Flanagan, 1954). Maintaining the

enthusiasm and interest of the staff involved in reporting critical incidents can also be problematic (Vincent, 1993).

In this thesis, the critical incident technique will be used to study the types, causes and consequences of nursing errors. To limit the reported weaknesses with this method, the participants will write their critical incidents anonymously and a structured format will be provided for them to state their responses to the critical incident. This may allow for more objectivity in their responses and also allow easier quantitative analysis of the data.

#### **3.5.4 The observational methods.**

Although records are an excellent secondary and relatively cheap source of data, they may not be accurate or complete. They may not also be suitable for the study of certain types of errors and substandard care, particularly where the focus of the study is on the skill of the health professional. This is when direct, yet labour-intensive, observation may be a more appropriate technique. The observational method constitute primary data, i.e. data collected specifically for the purpose of research in contrast to records which provide secondary data.

For example, in an observational study of junior doctors' skills in cardio-pulmonary resuscitation (Skinner et al., 1985) , all newly appointed house officers at a London teaching hospital were tested by means of a multiple choice paper and practical examination involving cardiac compression and intubation on a manikin during their first month as qualified doctors. They found that only 55 % of the doctors were competent at performing external cardiac massage and mouth to mouth ventilation on a manikin, and none would have achieved a pass in the advanced cardiac support examination in the United States. In a similar study (Wynne et al., 1987), fifty three nurses comprising nurses who had qualified for an average of 4.8 years were tested without prior warning on a

manikin while attending an orientation course for newly appointed staff. None of the 53 nurses performed basic life support adequately, and that the nurses were not able to accurately assess their own skills at cardio-pulmonary resuscitation. Barker and McConnell (1962) developed a disguised observation technique whereby the observer accompanied the nurse (who was unaware of the goal of the study) on her medication round and witnessed the administration of each dose. The observer then compared the observation with the original doctor's prescription, and he found significant variance between the two.

Observational studies allow the examination of the process of clinical care and the ways in which errors are made and corrected (Vincent et al., 1994). Allan and Barker (1990) argue that the observational method is subjective as well as objective, although there may be some possible effects of the observer on the observed. There is also the possibility that the observer may misinterpret what he or she has seen (Barker, 1980).

### **3.5.5 'Tracer' methodology**

Roberts (1987) argues that "it is impractical and unnecessary to monitor all aspects of care all the time. Appraisal of selective aspects of care may yield more informative results. Indeed, the use of "tracer" methodology (Kessner et al., 1973) in identifying area of appraisal can make the activity of audit more manageable. With this approach, the quality of care for selected conditions is "traced", the rationale being that care which is routinely given for common conditions is an "indication of the general quality of care and the overall effectiveness of the system delivering it" (Kessner et al., 1973). To date, no audit studies had been conducted using this method, although it appears to have obvious potential.

In this thesis, the general principle of this "method" will be adopted, i.e., by selecting patients with a specific problem (chest pain) to audit an aspect of their care (nursing assessment). By auditing the assessment of patients with chest pain, a clear picture can be formed not only about the quality of care received by this specific group of patients and of any deficiencies in their assessment but it could also provide a general indication of the quality of care in this particular clinical area.

It must also be noted that carepathways/guidelines may complement and enhance individualised care, particularly as the identification and tackling of variances are integral to this system of care (Johnson, 1997).

### **3.6 Conclusion.**

There is evidence that errors and adverse events are common in clinical practice. Apart from the studies on medication errors, there is a dearth of research on the types and causes of errors in nursing. The new climate of health care delivery requires more emphasis on the assessment of the quality of care, on identifying deficiencies and errors in care, and on reducing their incidence. The ability of audit to detect errors in practice has been insufficiently exploited in the past, and this may explain at least partially why audit has not been as effective in effecting improvement in practice. By taking full advantage in the recent developments in care such as practice guidelines and critical pathways, practitioners can give more appropriate care to their patients and variances in care can be detected more easily.

Much of the findings from medication errors' studies can have general application to other types of errors in nursing. There are clear indications that the same chain of events are involved in the aetiology of medication errors than in other types of errors and accidents. For instance, most of the studies on medication errors discussed in this chapter suggest that medication errors have multiple causes and that a system approach may be more effective in reducing them than the customary approach aimed at the individual who has made the error. When systems' approaches such as the implementation of unit dose system had been



used, there were significant reduction in medication errors. Thus, the importance of looking at systemic as well as individual factors in the study of nursing errors in general are strongly indicated, and the main thrust of this thesis will be to investigate the various factors and conditions of work which are involved in nursing errors so that measures can be taken to mitigate them.

A variety of methods for studying errors has also been discussed. The most powerful in the case of nursing errors are critical incident technique, occurrence screening, "tracer" methodology and observational studies. However, these methods do not take account of the psychological literature on errors and its possible contribution to clinical practice and in the management of errors. The next two chapter examine the psychological dimension of errors to gain insight into the nature and causes of errors and people's responses to them.

## **CHAPTER FOUR: PSYCHOLOGICAL BASES OF ERRORS.**

### **4.1 The problems of errors in health care field.**

The problems of errors and the need to understand them have received considerable attention in various fields, including education (Borassi, 1994), engineering (Petrosky, 1992), warfare (Strauss & Ober, 1990) and aviation (Alkov & Borowsky, 1980). But, in health care practice, the magnitude of the problem is still not fully appreciated, partly because of lack of definitions of the scope and nature of the problem (Leape, 1994). However, recent catastrophic events in other "high profile" fields such as the Bhopal methyl isocyanate tragedy in 1984, the Challenger and Chernobyl disasters of 1986, the capsizing of the Herald of Free Enterprise, the King's Cross tube station fire in 1987 and the Piper Alpha oil platform in 1988 have raised public and political concerns about human errors. People are appalled of the devastating impact of human errors to human life and welfare as well as to the environment and they want something done about reducing them. This has stimulated major inquiries and studies about errors and accidents to understand better their antecedents so that preventative measures can be undertaken. These have provided well documented epidemiology on errors and accidents, which has been found to have general application.

Yet, this greater understanding of the chain of events that leads to an adverse event or accident is still not widely used, particularly in the clinical field. For instance, Reason (1990) argues that attempts to minimise errors still tend to be reactive in nature, and that too much attention is focused on eliminating the recurrence of a particular unsafe act. This approach is unlikely to have any major impact on the system and lead to a reduction in errors. As Reason (1990) argues, errors "are usually caused by the unique conjunction of several necessary but singly insufficient factors". Therefore, proper analysis and understanding of the antecedents of errors are crucial before measures aimed at reducing errors or their

impact can be taken. People can also learn from errors. McIntyre and Popper (1983) suggest that "knowledge grows by the recognition of error...by the overthrow of old knowledge". Greater awareness of errors in clinical practice can contribute towards a more self-critical approach to care and safer professional practice.

The goal of this chapter is to examine the nature, types and causes of errors and what lessons can be learned from psychological theory and research on human error. It will be argued that knowledge and experience of errors with other systems can be applied to the clinical field not only because of the common characteristics that all systems share but also because there are only limited ways in which errors may occur (Reason, 1990).

#### **4.2 The nature of errors.**

An error may be defined as "a failure to perform an intended action that was correct given the circumstances" (Senders, 1994). Thus an error is a deviation between actual and expected outcome. The occurrence of an adverse or serious outcome does not necessarily mean that an error has been made. Senders (1994) argues that if the intention was correct and the action was properly executed, then no error had been committed. It is also important to distinguish between errors and violations. Violations are "deviations from safe operating practices, procedures and standards or rules" (Reason, 1990). In violations, actions are intended whereas in errors actions are unintended.

Since intention and action play a crucial role in the production of errors, it follows that any analysis of errors should encompass those two notions. For instance, Reason (1990) suggests that an error occurs when "a planned sequence of mental or physical activities failed to achieve its intended outcome". Heckhausen and Beckham (1990) also argue that human performance and errors can only be "fully

understood when being examined on the basis of a theory of action", i.e. that the performance of a task involve a sequence of actions which takes us from an initial situation to a final desirable situation. There are multiple options to choose from on the path to the final situation (Ohlsson, 1996). Correct performance depends on the selection of the appropriate option for a particular task. By using the notion of intentional behaviour in relation to error causation, it is possible to chart the exact point of departure between action and intention (Mandler, 1975), and to distinguish between the two error types : slips/lapses and mistakes (Reason, 1990). For instance, planned actions may fail to achieve their desired outcomes either because the plan itself is deficient or the actions did not go as planned. This is the basis on which Reason (1990) differentiates between mistakes and slips/lapses. He also argues that cognitive operations are implicated in the production of mistakes and slips/lapses. Accordingly, mistakes occur at the level of intention whereas slips/lapses occur at the level of selection, execution and storage. Thus, Reason (1990) offers the following definitions for mistakes and slips/lapses:

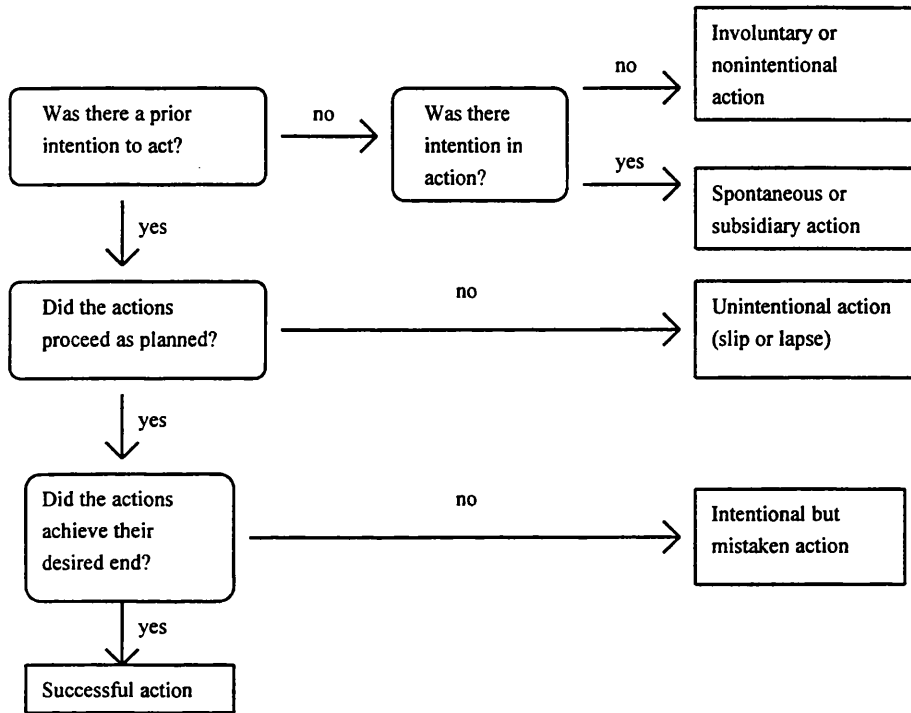
*Mistakes may be defined as deficiencies or failures in the judgmental and/or inferential processes involved in the selection of an objective or in the specification of the means to achieve it, irrespective of whether or not the actions directed by this decision scheme run according to plan.*

*Slips and lapses are errors which result from some failure in the execution and/or storage stage of an action sequence, regardless of whether or not the plan which guided them was adequate to achieve its objective.*

Slips are potentially observable errors (e.g. "actions-not-as planned"). On the other hand, lapses may not manifest themselves in actual behaviour as they largely involve memory failures (e.g. omitting to carry out a particular action sequence).

Figure 4.1 shows the relationship between intentional behaviour and production of mistakes and slips/lapses.

**Figure 4.1 Varieties of Intentional behaviour and error production (Source: Reason J, 1990)**



### 4.3 Cognitive processes and performance.

To understand why errors occur, it is important to gain insight into the cognitive processes that govern human thought and action. Human performance is influenced by various forms of cognitive processing. For most tasks, automatic, rapid and effortless mental functioning is required. For instance, riding a bike or driving to work usually requires little conscious thought. The reason why we are able to carry out most of these day to day activities automatically and without much conscious effort is that we carry an array of mental models or schemata (i.e. pre-programmed instructions) which are 'expert' at dealing with these recurrent activities (Reason, 1990). The schemata are activated by conscious thought or sensory inputs. Once activated, the functioning becomes largely automatic. For problem-solving as well

as for monitoring the automatic unconscious processing, there is an 'attentional control mode'. This works in a conscious, slow and deliberate manner (Reason, 1990). Thus, two fundamental types of cognitive processing can be distinguished: the schematic mode and the attentional control mode.

From this concept of cognition, human performance can be classified into three levels, namely skill-based, rule-based and knowledge-based levels (Rasmussen and Jensen, 1974). Skilled-based performance is concerned with patterns of thought and action which are largely unconscious and rely on stored patterns of pre-programmed learning or schemata, hence being related to the schematic mode of processing. With rule-based performance, solutions to familiar problems are governed by stored rules (e.g. of the type if X, then Y...). Knowledge-based performance is cognitively more demanding as it requires conscious analytic thought processing and stored knowledge. It comes into play in novel situations. Both rule-based and knowledge-based performance require attentional mode cognitive processing. Reason (1990) argues that all three levels of performance may be used simultaneously, although there is a tendency for experts to use more skilled-based than knowledge-based performance because of the possession of a larger repertoire of problem-solving rules than novices.

Thus, the 'skill-rule-knowledge' classification of human performance yields three basic error types, namely, skilled-based slips or lapses, rule-based mistakes and knowledge-based mistakes (Reason, 1990; Rasmussen and Jensen, 1974). While skill-based errors or slips are errors of action, rule-based and knowledge-based errors are termed mistakes because they are errors of conscious thought, i.e. errors of intention (Leape, 1994). According to Reason (1994), slips or lapses involve the "unintended deviation of actions from what may be a perfectly good plan" whereas with mistakes the "actions follow the plan but the plan deviates from some adequate path to the desired goal". In the case of ruled-based mistake, the

wrong rule is applied. On the other hand, knowledge-based mistake is the result of mis-applied expertise (i.e. the person does not possess the relevant knowledge to solve a novel problem). Because of the greater involvement of skill-based and rule-based processing in human performance, skill-based and rule-based errors are more common than knowledge-based errors.

#### **4.3.1 Role of cognitive factors in producing errors.**

These cognitive theories of performance have important applications to clinical practice and to understanding clinical errors. For instance, two classes of cognitive factors govern how clinicians form intentions to act at the "sharp end" of the system (Cook and Woods, 1994). These are knowledge factors and attentional dynamics. Knowledge is drawn upon to solve problems. Attentional dynamics are factors which govern the management of mental workload. Effective performance depends on the smooth integration of these two overlapping functions.

Knowledge factors may influence performance in a number of ways. The nurse may have inadequate knowledge to solve a particular problem or may have misunderstood the nature of the problem and has applied the wrong knowledge. For instance, an alcoholic patient may complain of epigastric pain. The nurse may wrongly interpret this as being due to gastritis due to his chronic alcoholism when the patient may be having a heart attack (myocardial infarction). This misunderstanding of the patient's problem may lead to a delay in seeking medical help, hence endangering the patient's life. Sarter and Woods (1994) argue that some practitioners may be unaware of gaps in their knowledge, believing they understand areas where in fact their knowledge is insufficient. This deficiency in knowledge may remain hidden for a long time until the practitioner has to confront areas where his/her knowledge is incomplete, resulting in an active failure.

Bransford et al (1986) have identified a different problem regarding the use of knowledge, i.e. the inability to activate the relevant knowledge for use in problem-solving. In this situation, the practitioner has the knowledge, but it is not accessible at the appropriate time, i.e. the knowledge remains inert. For example, a diabetic patient may suddenly become aggressive because of the onset of hypoglycaemia (low blood sugar level). But the nurse may attribute the sudden aggression to some personality factors due to her/his inability to connect hypoglycaemia with aggression at the time and may not carry out appropriate interventions such as testing the patient's blood for glucose level and giving the patient glucose to resolve the hypoglycaemic state. As a result of this mis-diagnosis of the patient's problem, the patient may go into a coma and may suffer serious complications.

In the clinical situation, various other factors may also distract attention and prevent the application of the relevant knowledge, thus affecting performance. "Attentional dynamics refers to those factors affecting cognitive function in dynamic evolving situations..." (Cook and Woods, 1994). For instance, these may concern the management of workload or the response to multiple signals and tasks or mental state. Indeed, it is difficult for one to attend to more than one thing at a time or to revise a situation assessment in the light of new cues. Factors such as the task demands, stress, fatigue, relationships at work and personal problems may all affect attention and cause omission or inappropriate selection of action for a given task. For instance, a nurse may have the skill and knowledge to administer medication correctly. However, heavy workload, stress and multiple demands on her/his attention may lead her/him to give a patient the wrong drug dose.

#### **4.4 Active and latent failures: Role of organisational factors.**

Recent catastrophic accidents such Three Mile Island, Heysel Stadium, Bhopal, Chernobyl, Zeebrugger, King's Cross tube station fire and the Challenger disaster caused both psychologists and human factors engineers to re-examine their theories



of accidents. Detailed analyses of these accidents led to the conclusion that although operator errors were involved in all of them, yet they were "accidents waiting to happen". Reason (1990) argues that major failures were present within the system long before these accidents happened, failures that both caused operator failures and made them impossible to reverse. These latent errors combined in insidious and often unforeseeable ways to breach the system's defences at some critical moments to produce the accidents. " Rather than being the main instigators of an accident, operators tend to be the inheritors of system defects created by poor design, incorrect installation, faulty maintenance and bad management decisions" (Reason, 1990). He refers to these as 'latent failures', errors whose effects are delayed in contrast to active failures which have immediate effects. Thus, when considering how human decisions and actions contribute to accidents, it is important to distinguish between these two types of failures -active and latent failures (Reason, 1990). Active failures are errors or violations committed by those at the "sharp end" (nurses, surgeons, doctors, pharmacists, pilots, air-traffic controllers etc.) whose actions can have an immediate adverse impact on safety. They include unintentional processes such as slips, mental lapses, mistakes due incomplete knowledge, skills or misreading the situations, and deliberate violations where the actions (though not the adverse consequences) were intended.

Latent failures are fallible decisions often taken by people at the "broad end" of the system (designers, high-level decision makers, managers and maintenance personnel). Fallible decisions taken at this level may have an insidious adverse effect on the conditions of work of the clinical staff. They include inadequate communication, poor planning, bad management decisions, lack of resources, inadequate training and faulty maintenance of equipment. For latent failures, the damaging consequences of human decisions and actions may lie dormant for a long time until they are triggered by some "local" conditions such as high workload, emergencies or when experienced staff are not available. It has also been suggested

that system failures are often the result of the accumulation of latent failures which alone may be innocuous but when combine together can lead to a catastrophic adverse event (Reason, 1990; Perrow, 1984; Turner, 1978). For instance, although the Russian analysts highlighted human errors and violations as the main cause of the Chernobyl nuclear disaster in 1986, more detailed examination of the chain of events leading to the accident revealed obvious design defects of the reactor, fallible management structure, lack of priority given to safety and operators who had limited understanding of the system. Thus, the root causes of the Chernobyl disaster were present in the system for a long time before the accident finally occurred. Reason (1990) argues that these latent failures, which were the prime ingredients for the Chernobyl accident, were not unique to the Soviet Union and to that particular accident. In subsequent accidents such as Zeebrugger and King's Cross tube station fire in 1987, latent failures were similarly found to be the main culprits. For instance, although the proximal causes of the capsizing of the Herald of Free Enterprise were due to errors (active failures) of the ship's officers and crew, yet it was the latent failures already present in the system which played a bigger role in this disaster. This is clearly illustrated in the following observations by Mr. Justice Sheen:

*At first sight the faults which led to this disaster were...errors of omission on the part of the Master, the Chief Officer and the assistant bosun...But the full investigation into the circumstances of the disaster leads inexorably to the conclusion that the underlying cause or cardinal faults lay higher up in the Company... From top to bottom the body corporate was infected with the disease of sloppiness.*

Applying these lessons to the clinical field, it is evident that a practitioner's choices, decisions and subsequent performance are influenced to a significant extent by the organisational goals and policies. These are termed strategic factors (Cook and Woods, 1994). Strategic factors are the trade-offs that people have to

make "between different but interacting or conflicting goals, between values and costs placed on different possible outcomes or courses of action, and between the risks of different errors" (Cook and Woods, 1994). Practitioners may have multiple goals which are all relevant, though they may potentially cause conflicts. In addition, there are constraints and covert influences imposed by the organisational and social context and these may represent another source of goal competition and conflicts. For instance, economic consideration may be given undue priority over safety or may cause safety issues to be overlooked.

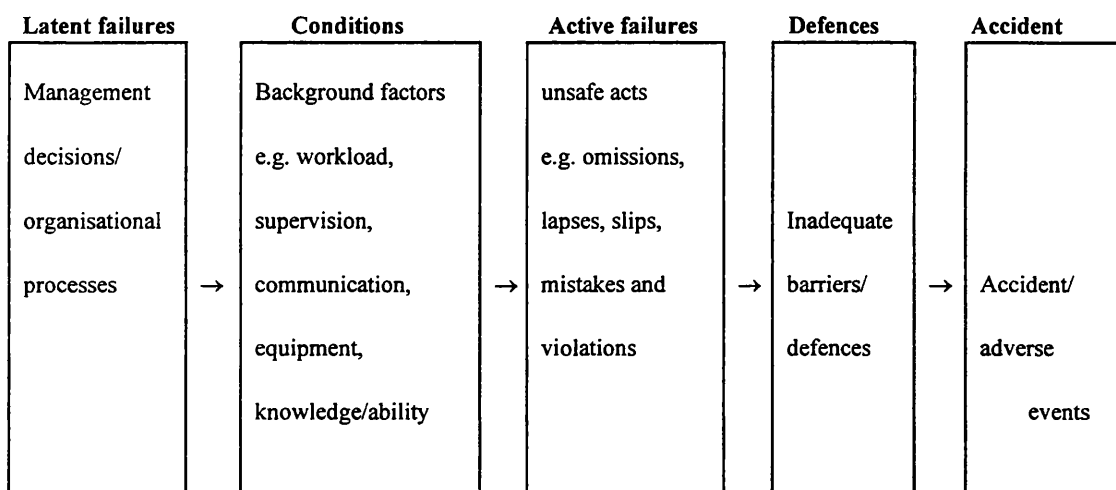
Gaba (1994) has suggested that the "traditional concept of error in real-world work situations must be replaced with a more sophisticated understanding of the performance of the entire organisation relative to its implicit and explicit goals". There is now growing awareness that workers at the "sharp end" are often the "victims" of problematic decisions further back in the system. Fallible decisions or "latent failures" made by personnel at the "broad end" of the system may lie dormant within the system for a long time, only becoming evident when they combine with other factors to breach the system's defences", resulting in an accident or adverse event (Reason, 1990). Similarly, Cook and Woods (1994) argue that the organisational context influences both the physical and cognitive factors available for people to perform their tasks. For instance, lack of investment in training and practice may affect the knowledge available for the practitioners to do their work competently. These various interacting factors underlie the need to concentrate on the chain of events leading to an accident or adverse event rather than the unsafe act itself. The way latent failures interact with local conditions to produce active failures is best illustrated by Reason's organisational accident model. This is discussed in the next section.

#### **4.5. Reason's organisational accident model.**

Reason (1990) has developed an organisational accident model (see figure 2) to be used as a mechanism for understanding the causes of serious accidents and to identify methods of accident prevention. This is essentially a model to "examine the chain of events leading to an accident or adverse outcome, to look further back at the conditions at which staff were working and the organisational context in which the incident occurred" (Stanhope, 1997). Latent failures (i.e. mistaken decisions at the top) may give rise to conditions which may cause difficulties for clinical staff at the "sharp end" of the system (e.g. nurses, doctors ). These may create error-producing conditions in the form of incompatible goals, poor planning and scheduling, failures in communication, lack of resources, inadequate investment in training, lack of attention to safety issues and inadequate maintenance of equipment. These latent failures may lay dormant for a long time until some unusual local circumstances such as high workload or lack of appropriately experienced staff on duty triggers an error (slips, lapses or mistakes) leading to an adverse event. For instance, inadequate investment in education and training as well as poor communication within the system may make the nursing staff less well-equipped to do their work properly, leading to inappropriate selection of procedures to deal with problems and also to inadequate recognition of hazards. Organisational context can also "set up and sharpen the strategic dilemmas practitioners face" (Cook and Woods, 1994). By not providing adequate resources or by introducing inappropriate work schedules, practitioners may have to deal with higher workloads and undue time pressures, and these may predispose to a variety of errors. Failure to develop the management skills of the practitioners may also lead to difficulties in the effective management and prioritisation of workload and tasks. All these may combine to weaken the system's defences, making an "accident waiting to happen".

Reason (1990) have grouped the error-producing conditions into seven broad categories: "high workload; inadequate knowledge, supervision or instruction; stressful environment; mental state (fatigue, boredom etc.); and change". Figure 4.2 illustrates the hierarchy of factors which may be responsible for an adverse event or accident.

**Figure 4.2 Organisational accident model: based on Reason (1990).**



In the clinical field, most attention tend to be paid to active failures, ignoring the contribution of latent failures in the causation of adverse events. As a result, there has been a tendency to apportion blame to staff at the "sharp end" of the system in most incidence of adverse event; and the background conditions such as lack of support, work overload and inadequate training are often not addressed. The use of Reason's organisational accident model may help clinical staff to analyse the evolution of an adverse event in a more systematic and rigorous way and may also provide better insight into the root causes of adverse events, hence enabling preventative measures to be targeted more appropriately.

#### **4.5.1 Applying the organisational accident model in the analysis of clinical incidents.**

Reason (1990) used his organisational accident model in the case study analyses of six major accidents (Three Mile Island, Bhopal, Chernobyl, Zeebrugger and the King's Cross underground fire) to show the nature and variety of latent failures. In all six accidents, Reason demonstrates how the insidious built up of latent failures over a number of years was the prime causes of the accidents. Some of these have been discussed earlier in this chapter.

Since errors tend to take only a limited number of forms, the organisational accident model is equally suitable to analyse adverse events in the clinical field (Reason, 1995). Two radiological case studies were used to illustrate in what way this approach could be used to analyse systematically the root causes of adverse events and medical accidents; and in both of them, Reason (1995) showed the crucial role of several latent factors in the causation of the adverse events/accidents. Vincent and Bark (1995) had also used this approach in the analysis of an obstetric incident, and were able to identify the various contributory causes of this "near miss". They were then able to make several recommendations to reduce risk to patients based on their findings relating to the root causes of the incident.

Stanhope et al (1997) argue that the use of a formal model in the analysis of adverse events as well as near-misses allows the clinicians not only to identify active failures but also "the potentially more important latent failures which create the conditions in which people make errors". They use Reason's organisational accident model to systematically examine a number of adverse and potentially adverse events involving actual cases in obstetrics. Two cases (one related to obstetrics and the other to nursing) will now be summarised to illustrate how the

model may be applied to understand the chain of events which leads to an adverse or potential adverse event.

*The obstetric case concerns a 25 year old woman who was admitted for induction of labour at 36 weeks gestation because of an onset of pre-eclampsia at 32 weeks gestation. The staff involved were the obstetric registrar, the obstetric senior house officer, four midwives (one was an agency midwife and another one was moved from the post-natal ward because of staff shortage) and an auxiliary nurse. A consultant and senior registrar were on call.*

*On admission to the labour ward , the cardiotocograph recorded a normal fetal heart rate. Induction of labour was started. Approximately 12 hours later, the G grade midwife noted unprovoked decelerations which was confirmed by the senior house officer. The registrar was contacted who too noted deep decelerations. After discussion with the consultant, it was decided to proceed to a caesarian section. In theatre, the anaesthetist made three unsuccessful attempts at siting the spinal anaesthetic. As the baby was getting increasingly distressed judging from the deep decelerations, the G grade midwife called the registrar who decided that a general anaesthetic should be administered. Half an hour later, a floppy infant was delivered and handed over to the paediatric senior house officer for intubation, but this was unsuccessful. The locum paediatric registrar who arrived a couple of minutes later also had some difficulties in intubating the baby. The senior paediatric registrar as well a neonatal nurse was called in by another midwife when she learned of the difficulties being experienced by the two paediatric doctors in resuscitating the baby. The baby was then admitted to the Special Care Baby Unit, with low pH values and poor Apgar scores. The baby made an uneventful and full recovery and was able to return to the postnatal ward on the 4th day.*

The case showed a number of active and latent failures. The active failures concern failures of anticipation and forward planning, instances of poor communication, errors of judgement, poor co-ordination of care and inadequate skills. When the conditions of work were analysed, various deficiencies were

noted, including insufficient number of midwives working on the labour ward to cope with the emergency, lack of supervision of inexperienced staff and piling up of equipments and supplies in the labour ward corridor. The latent failures identified were poor communication between the staff involved, lack of management support, insufficient experience and training with particular equipment in the unit and lack of induction of agency midwives and locum doctors to the ward. Stanhope et al (1997) state that this analysis revealed a number of errors combined with a set of unusual circumstances which together could have led to a catastrophic outcome.

The nursing example described below was selected by the researcher in the course of the analysis of 20 critical incidents of nursing errors obtained in a pilot study related to the study reported in chapter 6. This case will be presented at an international research conference on reflective practice

*The case concerns a 34 year old single woman who was admitted on a 19-bedded acute medical ward following an overdose of tranquilizers mixed with alcohol. The woman had one previous admission to the same ward approximately six months earlier again for an overdose of drugs. She was described in her previous medical notes as being manipulative, immature and attention-seeking.*

*The medical ward is located on the first floor and has a "Nightingale design" with one wing occupied by female patients and another wing occupied by male patients. From the nurses' station in the middle of the two wings, only the male wing can be directly observed. The patient was nursed on a bed at the end of the female wing next to the common bathroom and toilet area. There were no other bed vacant on the ward at the time of the patient's admission.*

*Four staff were on duty at the time of the incident: an F grade nurse ( in charge), a D grade Enrolled Nurse, a second year student and a health care assistant. This was the typical staffing*



#### Chapter 4: Psychological bases of errors

level for this ward. The management has been unresponsive to staff's concern about staff level on this busy medical ward. None of the staff on duty had any psychiatric training or experience.

On admission to the ward the previous evening, the patient was described as being rather agitated. The doctor prescribed a number of tranquilising drugs to be given 6-hourly as necessary. The patient kept on asking for the drugs during the night and was very demanding and disruptive.

After the handing over of shift by the night staff at 8 o'clock in the morning, the F grade allocated herself to look after the patients in the male wing as it was relatively the "lighter" wing. The three other staff were asked to work in the female wing which contained a few stroke patients. The student nurse was allocated to look after the "overdose" patient as well as two other patients next to her who required minimal care.

During the morning, the patient was very unsettled. She was given all her tranquillising drugs by the F grade nurse at 9 o'clock, but she repeatedly asked for more drugs. She became abusive when she was told that she was not due for them. On two occasions, the student nurse came to report to the F grade nurse that the patient kept on going to the toilet/bathroom area and was acting very strangely. The student nurse was told to continue to maintain discrete observation on her. At approximately just before mid-day, the student nurse went and helped a care assistant to change an incontinent patient. When she returned back to her patient after about five minutes, she could not find her. She rushed to the toilet/bathroom area. She found the window wide-opened. When she looked down, she could see the patient at the bottom on her side and she appeared conscious. The student nurse went and told the F grade that the patient had jumped out of the window. The latter asked the student nurse as well as the D grade nurse to go down and stay with the patient. In the mean time, the F grade nurse bleeped the house officer who took about five minutes to respond to her bleep. The doctor said she would go down and examine the patient. When the two nurses came back to the ward after about 20 minutes later, they reported

*that the patient had sustained a fracture of her tibia/fibula and also possibly a fracture of her pelvis and that the doctor had arranged her transfer to the A&E department.*

The analysis of this case reveals a series of errors combine with a set of unusual circumstances to produce the adverse event. A number of nursing management failures (active errors) were identified. There were evidence of mistakes, poor co-ordination of care, inadequate skills/experience in psychiatric management, failures of anticipation of problems, poor communication and slips and lapses. For instance, the F grade nurse delegated the task of looking after the patient to an inexperienced student nurse and did not specify clearly enough what she ought to do. The F grade nurse did not ask the doctor to re-assess the patient in the morning. She did not anticipate the patient' s suicidal intent. She should have bleeped the emergency team after the patient had jumped out. A number of existing conditions may also have contributed to the error such as poor staffing of the ward, the design of the ward, lack of window blocks and the staff nurse was unable to properly co-ordinate care because she had a case-load of patients.

There was also some organisational failures which may have contributed to the adverse event. Because of the insensitiveness of management, the staff nurse did not feel confident to request more staff. There was poor communication between the senior clinical nurse and the ward staff. There was also a lack of guidelines/policies regarding the management of overdose patients on medical wards. The staff were not trained for this type of work.

Although blame was apportioned to the F grade nurse for this incident, the analysis revealed that the management through their policies, fallible decisions and management style played a major role in the causation of this adverse event. But it is unlikely that any changes will be effected because the management has used an individual rather than a system approach to deal with the problem.

#### **4.6 Conclusion.**

The importance of learning from errors in order to prevent them is gaining more currency in many fields. However, error management in the clinical field is still in its infancy, particularly when compared to aviation. Safety in aviation has been institutionalised and the adherence of airlines and pilots to required safety standards is closely monitored (Leape, 1994). In medicine, although errors are not ignored and audit is widely used, preventative activities are focused on incidents and individuals and root causes or the underlying system failures are rarely sought (Leape, 1994). To learn from errors, one should be able not only to detect errors but also understand their antecedents (Ohlsson, 1996). The need for systematic and rigorous examination of errors and adverse events in the clinical field is long overdue, judging from the significant number of people who are affected by iatrogenic injuries (Harvard Medical Practice Study, 1989).

In the next chapter, nurses' psychological responses to their errors will be critically examined. It will be argued that the types of responses nurses or their managers make in response to errors may influence the way they deal with the error. It will also be shown that some types of responses are positive and may promote learning

## **CHAPTER FIVE: PSYCHOLOGICAL RESPONSES TO ERRORS.**

### **5.1 Psychological impact of errors.**

A nursing error is generally regarded as a threatening and undesirable event by most clinical staff, and it may cause emotional distress, particularly if the error has led to some harm to the patient. The staff involved may seek explanation as to "why misfortune has befallen them" (Brewin, 1988), and what would be its consequences to them and to their patients. Staff may feel the need to discuss their errors with supportive colleagues (e.g. Wu et al, 1991; Christensen et al, 1992; Arndt, 1994).

The aim of this chapter is to examine what causal explanations staff may use in response to an error and the potential effects of these explanations on their responses to the error. The types and range of emotional reactions experienced by staff following an error and their manners of coping and dealing with these emotions will also be critically analysed.

### **5.2 Explanations of causes of the error: Attribution theory.**

Attribution theory "involves an attempt to explain how ordinary people explain behaviour by making attributions" (Buss, 1978). It has been suggested (e.g. Heider, 1958; Jones & Davis, 1965; Weiner, 1985) that when people are faced with unusual, unexpected or unpleasant events, they tend to search for meaningful explanations of their causes. An explanation "serves to disambiguate an event", hence enabling the individual to respond to it in a more systematic manner (Lalljee, 1982). However, different explanations may have different intra- and interpersonal effects. On the whole, people tend to explain events in ways designed to protect them or even to enhance their self-esteem (Tetlock, 1980). These may have implications in the way an individual respond to an adverse event such as an error in clinical practice.

A central feature of attribution theory is the partition of causes. The cause of an event is defined as an antecedent (usually human agency) that is sufficient to produce the event (Shaver and Down, 1986). People typically categorise causes very quickly and the inferences they draw from these categorisations serve to guide reactions to the event (Anderson, 1991). Different causal distinctions have been proposed, but the most common distinction is whether the cause is located within the person or outside the person. This distinction has been referred to as internal-external, person-environment and disposition-situation (Wimer and Kelley, 1982). Numerous attribution studies have shown that people tend to blame external factors for failure but attribute success to internal factors. Indeed, Weiner et al (1972) suggest that internal attributions relative to external "heighten affective reactions such as pride for success and shame for failure".

However, the internal-external distinction is unlikely to be adequate by itself and other categorisations have also been proposed. For instance, Weiner (1980) has distinguished causal attributions in terms of three dimensions: locus (i.e. internal versus external), stability and controllability. "An explanation in terms of a person's intelligence implies a stability which is not implied by an explanation in terms of effort, though they may be both internal explanations" (Laljee, 1982). Abrahamson et al (1978) have also argued for the existence of a globality dimension. Global causes produce the same sort of effects over a wide domain as opposed to specific causes which relate to a more limited domain.

People tend to explain events in ways to enhanced their images of themselves such as accepting responsibility for good performance and denying responsibility for poor performance (Miller, 1976; Arkin et al., 1976; Federoff & Harvey, 1976). However, in some cases people may act contrary to this ego-defensive hypothesis by accepting responsibility for poor performance and denying credit for good performance (Tetlock, 1980). Tetlock argues that this is a form of

"strategic presentations" aiming at gaining public approval. Typically, this type of responses may occur in professionals such as teachers and nurses as the public expect them to be accountable for their actions regardless of whether the outcome is a success or failure (Sarason, 1971).

There is a pervasive tendency for actors to attribute their actions to situational requirements and for observers to attribute the same action to stable personal dispositions" (Jones & Nisbett, 1972). For instance, management tends to blame bad outcomes on dispositional factors (i.e. actors personal inadequacies) rather than attribute them to situational factors beyond the actor's control. Fiske and Taylor (1984) calls this type of response the "fundamental attribution error". Hewstone (1990), on the other hand, refers to the attribution of negative out-group behaviour to internal causes and negative in-group behaviour to external causes as the "ultimate attribution error". These phenomena were clearly evident in the reactions of different parties in the aftermath of the Chernobyl disaster. For instance, the Russian blamed operator' errors for the disaster whereas the English blamed lack of a safety culture in the Russian's nuclear industry (Reason, 1990). These responses are common following a negative incident and may bias one's perception regarding the root causes of the incident.

### **5.3 Causal attribution and emotional reaction.**

Different types of dimensions of causal attributions appear to trigger different types of emotional reactions to an event. If an event is perceived to have been caused by an uncontrollable factor, one may feel pity for the person, hence triggering helping behaviour towards the person who is responsible for the event (Weiner, 1982; Lerner & Mathews, 1967; Sharrock et al., 1990). Conversely, if the cause of an error is perceived to be controllable, anger may be directed towards the person (Weiner et al, 1980). Wolf (1989) suggests that medication errors evoke guilt feelings and stress in nurses because they "implicitly equate

medication errors as sins". It has further been noted that people who generalise from a specific mistake to make a global self-assessment of incompetence are likely to experience more distress than those who consider the error to be an isolated one (Christensen et al., 1992).

Outcome severity also has an effect on causal attributions. For instance, it has been observed that when the outcome is severe, observers tend to attribute causes of the behaviour to internal factors whereas actors will tend to attribute the causes of the behaviour to external factors (Chaikin & Darley, 1973; Dejoy, 1980). A higher level of responsibility and punishment may be assigned to the individual for severe rather than non-severe outcomes (Dejoy, 1990). People generally tend to see themselves as less responsible for near-misses rather than accidents with serious outcomes (Dejoy, 1990; Dejoy & Kippel, 1984). This may impede them from learning from these situations. Indeed, Brewin (1984) argues that a "sense of causal responsibility is likely to be adaptive, because the perception of an orderly relationship between one's actions and outcomes preserves belief in one's ability to exercise control".

When people accept blame for an incident, it is likely to be "behavioural self-blame" (Janoff-Bulman, 1979). With behavioural self-blame, people blame their actions for the incident rather than their more stable characteristics such as ability. Dejoy (1990) argues that this type of response is characterised by internal, unstable and controllable attributions which allows the individual to accept responsibility while preserving a sense of control. Taylor et al (1984) suggest that attribution made to factors under personal control might be more adaptive than attributions made to uncontrollable factors. In the same vein, self-blame (i.e. behavioural self-blame) amongst victims of accidents were found to be associated with superior coping whereas attribution of blame for their accident to another person was related to poor adjustment (Bulman and Wortman, 1977). Brewin

(1988) also found that subjects who rated themselves as less causally responsible for their accidents appeared to be poorly adjusted when they got back to work. It would thus appear that people who take responsibility for an action regardless of its outcome cope better compared to people who deny their role in an outcome and blame others for it. When one blames an adverse outcome to personal traits, one experiences feelings of guilt and helplessness (Peterson et al, 1981 ; Janoff-Bulman, 1979). These types of responses may discourage learning from the adverse experience.

#### **5.4 The application of attribution theory to nursing errors.**

Following from attribution theory, one might expect nurses to take credit for their good work and success but blame situational and/or organisational factors for their errors. Thus, from the perspective of Reason's organisational model of accident (1990), nurses at the "sharp end" may be inclined to attribute causes of "active failures" to "latent" factors while managers may blame individual nurses for the occurrences of errors and adverse events. In situations where an error by a nurse has led to a serious outcome, it is particularly likely that her or his superiors will blame her or him for it while the nurse may seek an external explanation for the error (Mitchell & Wood, 1980). Davidhizar (1989) argues that blaming others for an error is a technique in which personal responsibility for one's action is deferred, hence protecting one's self-esteem. However, these types of responses may cause a stalemate where no one is prepared to take responsibility for maintaining safety in the clinical situation and tackling the root causes of adverse events. There is also a strong belief among nurses that when errors are made in the delivery of care, the nurses "violate the value to first do no harm and fail to uphold the trust that patients place on nurses" (Wolf, 1989).

Causal attributions may serve different functions, and are predicted to have an impact on responses to an error as well as subsequent performance. For instance,



if a nurse makes an internal attribution about an error by blaming specific actions for its occurrence, she or he will be more likely to learn from it. On the other hand, if she blames enduring personal dispositions for the error or blame external factors, she or he might be less inclined to change her or his future behaviour (Bardwell, 1986).

Using an attributional model of leaders' responses to subordinate poor performance in a study involving nurses, Mitchell and Wood (1980) also found that outcome-severity had a disproportionate effect on responses to an incident. For example, a nurse may be assigned a higher level of responsibility and punishment for an error with a serious outcome than with a less severe one regardless of whether or not the nurse was personally responsible for the error. Nursing supervisors were reported to make attributions and responses partly as a function of the seriousness of the outcome, and this may cause the supervisors to overlook the fact that these outcomes may be completely out of the subordinates' control (Mitchell & Wood, 1980).

Thus, supervisors tended to explain instances of poor performance from their subordinates overwhelmingly in terms of internal attribution such as lack of ability or effort; and the strategies that they would normally suggest were mostly directed towards changing the subordinates' behaviour through feedback, punishment or training (Mitchell & Wood, 1980). Supervisors rarely made an external attribution about a subordinate poor performance, hence less attention may be directed at the situations (e.g. lack of resources, lack of information) that may have led to the poor performance. Mitchell and Wood (1980) argue that the "difference in perception of causes of poor performance may lead to inappropriate appraisals and points of conflicts".

Nurses strive to give a high standard of care to their patients and also ensure the safety of their patients (Hibberd & Norris, 1992). Successful completion at a task may boost one's self-esteem, especially if the task is felt to be important (Roth & Kubal, 1975). Conversely, making mistakes in important tasks may give rise to feeling of helplessness and this may well generalise to new situations (Seligman, 1975). For instance, Wolf (1989) states that nurses feel guilty when they have made a medication error and they feel they have not upheld their duty to protect their patients. Nurses also tend to find errors threatening to their professional image and status and this may affect the way they respond to them (Arndt, 1994). Thus, the types of attribution nurses make about their performance may have long term implications for their attitudes and behaviour. Because of the perception that nurses ought to be competent and effective at all times (Arndt, 1994), nurses' supervisors and colleagues may "over-react" when a nurse has made an error and blame could be seen to be unfairly apportioned.

#### **5.4.1 The importance of attribution in the prevention of errors.**

Dejoy (1985) argues that attribution theory research can be applied to safety management at the workplace. Indeed, the perception of causality is important in risk assessment. Dejoy identifies three aspects of risk management which are particularly essential in the prevention of accidents. The first one relates to the way workers perceive the personal risk associated with their workplace. The second concerns the response of supervisors to safety incidents, and the third the influences of upper management on the safety climate.

With regards to the first point, Dejoy (1985) argues that several types of attributional biases may affect the way the workers perceive safety situations. For instance, whether workers take self-protecting actions or not against risks inherent with their work will depend on their appraisals of the risks involved. Rosentock (1974) argues that risks associated with the workplace are often

misjudged or distorted because of attributional biases. If an incident has led to a serious outcome, more responsibility is assigned to the people involved than if the outcome is mild. There may also be a tendency for a worker to attribute the cause of a negative event to situational factors rather than to his/her own unsafe behaviour. On the other hand, if his/her colleague is perceived to be responsible for the event, attribution of blame tend to be made to dispositional factors rather than environmental factors. Workers may also make errors in inferential process because of "availability heuristics" (Tversky and Kahneman,1974). For instance, workers may judge whether an event is frequent if instances of it are easy to recall. Thus, these types of attributional responses may influence nurses perception of quality and safety issues nursing care.

In the second case, the supervisors may implement inappropriate solutions to safety problems if their attributions of the causes of the safety problems are inaccurate or in some way biased. These measures can worsen the safety problems rather than eliminating them. For instance, Mitchell and Wood (1980) found that nursing supervisors almost always blamed nurses for nursing care accidents and rarely sought environmental cues to the accidents, hence failing to address any situational factors which may be contributing to these accidents. Some of the sources of bias may be severity of outcome (Chaiken & Darley,1973) and self-protective motives (Burger,1981). For instance, in the case of a severe safety incident, the supervisor may wrongly believe that the "event was somehow controllable and thus personally avoidable in the future" (Shaver, 1970). Dejoy (1985) argues that by attributing responsibility of these types of incident to those involved, the supervisor may satisfy his self-protective motives , i.e. deny his/her own responsibility in any negative events but accepting praise for success. Dejoy believes that biases and distortions in attributional process of the supervisors can have a serious impact on the safety performance of the workforce, particularly in supervisors' tendency to blame workers for errors by

making internal attributions. Thus, the supervisor may take credit for any good safety programme but attribute poor performance to the employees' carelessness or lack of ability. This may affect the way the supervisor responds to the situation. For example, if the supervisor attributes errors made by employees to behavioural/internal causes, it may stop him or her from analysing the incident. As a result, the root cause of the problem may not be tackled. Moreover, whether or not the employee will change his behaviour will depend on his perceptions of whether he has been treated fairly or not (Rosen and Jordee, 1974). Thus, disciplinary judgements may have a long term implications for staff morale and future employee behaviour.

Finally, the upper management or those at the "blunt end" of the system (Reason, 1990) have an important role in creating proper safety climate. Dejoy (1985) contends that the upper management will formulate safety policies according to its perception of the causes of poor safety performance, and these policies and related actions will have an enormous influence on the safety climate of the organisation. Any inappropriate safety policies and measures will affect adversely people at the "sharp end" of the system (Reason, 1990). The type of safety policies the management formulates and the measures it implements to reduce risk is a reflection of how upper management perceives the cause of poor safety performance.

### **5.5 Stress associated with errors in practice.**

The level of stress which nurses experience may be significantly influenced by the types of causal attributions they make about the errors. If the cause of an adverse event is perceived to be "controllable", more stress is experienced than if the cause is perceived to be "uncontrollable" (Weiner et al, 1980). Similarly making internal attribution (i.e. accepting responsibility ) for an error may lead to considerable stress (Wu et al, 1991).

Both doctors and nurses can be very affected by errors they make, particularly if the errors have a serious outcome (Christensen et al., 1992; Arndt, 1994). Yu et al (1989) reported that the most cited stressors for nurses were making mistakes in nursing care, keeping on top of things and uncertainty about the outcome of their actions. In the case of physicians, Levinson et al (1989) found that severity of outcomes of an error as well as the perceptions of other people regarding the error play an important part in the resultant stress and guilt feelings. It is also stated that physicians become emotionally devastated following a mistake which has harmed or killed a patient and this may manifest itself as a mixture of profound guilt, fear, anger and humiliation.

Anecdotal evidence also reveals that nurses are emotionally severely affected by their errors, and some have even voluntarily given up their job following errors which have led to serious or fatal outcomes. More often errors produce overwhelming stress which could seriously affect the performance of the nurse in their immediate aftermath, making repeat errors more likely. It is suggested that by creating conditions of information overload and mental fatigue, stress can impair accuracy of performance (Cohen, 1980). Motowidlo et al (1986) found that "feelings of job related stress led to feelings of depression that causes nurses to perform less effectively in the personal and cognitive/emotional aspects of their job".

A link between stress and poor performance among doctors has also been found (Firth-Cozens & Morrison, 1989). However, Christensen et al (1992) reported that physicians are often emotionally isolated during these critical time as support is usually not forthcoming. For instance, Hilfiker (1984) states "we see the horror of our mistakes, yet we are given no permission to deal with their enormous emotional impact...the medical profession simply has no place for mistakes". It has been argued that it is crucial for doctors to receive support from their

colleagues and superiors following a mistake to promote better coping (Wu et al, 1991). Yet, it is claimed that only token attempts are made by the medical profession to understand the impact of an error on the professional and personal life of the doctors, and that there is no process to evaluate supportively the circumstances of an error and its perceived causes (Christensen et al., 1992; Levinson, 1989).

### **5.6 Coping with errors.**

Coping follows the cognitive appraisal of the situation, and is defined as the constantly changing cognitive and behavioural efforts that the individual uses to manage (reduce, minimise, master, or tolerate) the internal and external demands of the person-environment situation (Lazarus & Folkman, 1984). Lazarus et al (1986) suggests that coping serves two functions: dealing with the problem causing the distress (i.e. problem-focused coping) and regulating emotion (i.e. emotion-focused coping). In problem-focused coping, the individual uses "aggressive interpersonal efforts to alter the situation, as well as cool, rational, deliberate efforts to problem solve, and emotion-focused forms of coping include distancing, self-controlling, seeking social support, escape-avoidance, accepting responsibility and positive reappraisal" (Folkman et al, 1986). They also argue that the type of coping that is used will vary according to the nature of the stressful event. For instance, "when people felt their self-esteem was at stake, they used more confronting coping, self-control, escape-avoidance, and accepted more responsibility than when their self-esteem was not at stake; when a goal at work was at stake, they used more planful-problem solving" (Folkman et al, 1988). They also found that when people are faced with a situation that is capable of being changed, they would be likely to use problem-solving strategy whereas when the situation is perceived not to be amenable to change, they would use distancing.

It is argued that following a mistake with a deleterious effect on the patient, physicians are likely to utilise a variety of coping mechanisms and in-group practices to manage the mistake (Mizrahi, 1984). He suggests that coping mechanisms are healthy adaptation against stress whereas defence mechanisms such as denial, discounting and distancing are maladaptive. Mizrahi argues that physicians often resort to these defensive mechanisms to "ward off negative typifications resulting from the deleterious consequences of an act". Leape (1994) contends that the inability of staff to accept error in their practice prevent them from dealing constructively with them when they do occur. In a study of reported mistakes made by house officers, Wu et al (1991) found that those physicians who accepted responsibility for their mistakes as well as discussing them with their colleagues and superiors were more likely to learn from them and made constructive changes in their practice than those physicians who denied responsibility or kept the mistakes to themselves. They also found that attributing the cause of the mistake to internal factors such as inexperience associated with constructive changes whereas attribution of the mistake to job-overload (i.e. external factor) were related to defensive changes in practice.

### **5.7 Conclusion.**

It has been argued that explanations given about the causes of errors as well as the emotional responses to errors may have an influence on the person's mental well-being and subsequent behaviour. Although these judgements or attributions may not necessarily be accurate, yet they may affect the way errors and resulting stress reactions are perceived and managed. Attribution theory is a useful framework to help us understand the way people react to their errors as well as the potential implications of these reactions to practice. In particular, it has been suggested that the types of causal attributions clinical staff make about their errors can lead to either positive or negative effects on their performance.

Unless we take into account what clinical staff perceive to be the causes of errors and inadequacies in care, we may not apply the types of measures that are most likely to be supported by them and that will have the most effective results. It is also crucial for all staff to gain insight into the effects of causal attributions on their behaviour, particularly in relation to maintaining quality and safety in their care. In particular, clinical staff need to be encouraged to accept responsibility for their actions even when things have gone wrong as this is likely to foster greater commitment to improve the safety of their care. Managers too should endeavour to analyse clinical errors and adverse events in a more objective manner, taking into account the role of the environment as well as the possible effects of their own decisions or policies in the production of errors rather than resorting to apportioning blame to individual staff as a first resort.

In this thesis, nurses' perception of causes of errors as well as inadequacies (e.g. omissions) in care will be examined. Since inadequacies such as omissions in assessment and care of patients may create the conditions for more serious errors to occur, it is important to ascertain whether nurses are inclined to accept responsibility equally for inadequacies in care and errors. This knowledge may enable more effective strategies to be implemented to improve the quality and safety of care.

### **5.8. Overview of introductory chapters.**

In the preceding chapters, various aspects of the work of nurses have been considered. It has been stressed that the context within which nursing is practised as well as the particular methods nurses use to deliver care have an important influence on the quality and safety of nursing care. Although nurses and other health care professionals are trained to function at high level of proficiency, errors and other omissions are still made in the process of care. But, they are mostly underreported, and there is particularly a dearth of research on nursing



errors and the factors that lead to them. In nursing as well as medicine, the predominant approach used in dealing with errors is on focusing on the individual who has committed the unsafe act. However, a review of the literature on the nature of errors and accidents reveals that many interacting factors are responsible for their occurrences, and methods of preventing them are more likely to be successful if the complete chain of events leading to the adverse event is examined. It is essential to focus on the root causes of errors and adverse events and not just the unsafe acts. It was also discussed in chapter 5 that nurses are likely to make causal attributions about negative events such as errors and adverse events and that these may influence their behaviour in either a positive or negative sense. Thus, the nature and causes of errors and adverse events in the clinical field should be considered through a much broader perspective than is the case at present.

The importance of all these will be made clear in the series of empirical studies that are presented in the next seven chapters. For instance, the nature of nursing errors will be investigated to ascertain the types of errors made by nurses and the way they respond to them. The subsequent studies will then examine the conditions and circumstances that may trigger errors and adverse events. For instance, if the nurses do not assess their patients thoroughly or do not record the results of these assessments, important aspects of the patients' care may not be delivered, leading to poorer quality of care or adverse incidents. Nurses perceptions of these 'error-producing conditions' as well as causes of errors and inadequacies using attribution theory will then be investigated to establish what types of preventive interventions are more likely to be successful in improving the quality and safety of nursing care.

## *Chapter 5: Psychological responses to errors*

Thus, the empirical studies are structured as follows:

In chapter six, types of errors in nursing, their antecedents, consequences as well as staff reactions to them will be investigated. The rationale of this study is to identify the circumstances leading to various types of nursing errors to enable further studies to be carried out.

Chapter seven examines the assessment of patient with chest pain. Assessment is a crucial part of the nursing process and if it is not carried out correctly, it can affect the total care of the patient. Therefore, it is important to identify frequencies of omissions in assessment so that common problems in assessment can be identified and corrective actions instituted.

In chapter eight, the causal attributions that nurses used to explain their omissions in the assessment of patient are investigated. According to attribution theory, attribution influences behavioural responses to an event. Preventive strategies are unlikely to be successful if we do not take into account nurses' perception of the causes of their omissions.

The aim of chapter nine is to ascertain the level of nurses' clinical knowledge relating to chest pain. Knowledge informs practice, and it is postulated that inadequate knowledge may affect nurses' clinical practice. However, evidence of failure to recall relevant knowledge may not necessarily indicate a lack of knowledge. It may simply mean that the knowledge is "inert" and cannot be accessed from memory to be used at the appropriate time, and that by providing recall cues/prompts, nurses' recall of the appropriate clinical knowledge can be improved.

Chapter ten will examine nurses' causal attributions of more "defined" errors as nurses may not perceive omissions and other inadequacies in assessment as errors and may react differently to more "obvious" errors. Two scenarios will be presented to the nurses, one depicting an error with a serious outcome and the other a non-serious outcome. It is predicted that errors with a serious outcome will have a greater impact on nurses' behaviour than one with a non-serious outcome.

In chapter eleven, the findings of the studies reported in the preceding chapters will be used in the implementation of a strategy (i.e. the use of a carepathway/clinical guideline) to reduce omissions in the assessment and care of patients with chest pain.

The effectiveness of the care pathway in improving the assessment of patients with chest pain will be investigated in a follow-up study reported in chapter twelve, the aim of this study being to ascertain whether there is a reversal of improvement in assessment when staff cease to use the carepathway.

Chapter thirteen reviews the findings of the whole thesis, discusses their implications to clinical practice and makes recommendations.

## **CHAPTER SIX : TYPES OF NURSING ERRORS AND THEIR PERCEIVED CAUSES: THE POTENTIAL FOR LEARNING FROM THEM.**

### **6.1 Introduction and background to the study.**

There are growing concerns about errors in clinical practice, particularly when they affect the quality of care or put patients' life at risk. Some recent studies and reports (e.g. Hiatt et al , 1989; Wu et al, 1991; McL Wilson et al,1995; Macara, 1995) have suggested that mistakes are common in medical practice. Some of these have resulted in adverse events and litigation. But, as it has been discussed in chapter 3, actual studies of errors in nursing are virtually limited to the investigations of medication errors. Consequently, very little is known of the range of errors and inadequacies that occur in nursing and the way these may affect care. It is also not fully clear either how nurses would respond to their errors. In their study of house officers' mistakes, Wu et al (1991) found that most of the house officers learned from their errors and made constructive changes in their practice. It is important to ascertain whether this applies to nurses as well.

The growth of audit and professionalism in nursing have made it imperative for nurses to ensure not only that they give quality and safe care to their patients but also that they should be accountable for their actions. This places a responsibility on nurses to maintain their level of competence and to develop greater understanding of the factors that may affect the way they give care. However, there has been a tendency for audit in nursing to focus too much on outcome indicators such as patient satisfaction level and not enough on structures and processes. Wan and Shuckla (1987) argue that these may not provide a reliable measure of quality, and that a more standard measure may be generated from reports concerning errors, patient falls and injuries, inappropriate diagnostic and therapeutic interventions, and other incidents. Similarly, Crombie and Davies

(1991) have postulated that the apparent lack of impact of clinical audit may be related to a reluctance to examine the causes of deficiencies in care.

Although errors cannot be completely eradicated in nursing, they can be reduced. The promotion of a climate whereby nurses can discuss and analyse the causes of their errors may be more effective in improving the quality and safety of care than the fostering of a blame culture. At present, too many errors go unreported or their antecedents are not properly investigated. This not only undermines patients' safety but also reduces the opportunity for nurses and their managers to learn from errors and make appropriate changes in their practice.

This study presented below appears to be the first of its kind reported in the literature on nursing errors. It aims to address the following questions:-

1. What types of errors nurses make?
2. What are the causes of nursing errors?
3. How do nurses respond to their errors?
4. What factors predict whether nurses make changes in their practice following the error?

#### **6.1.1. Operational definition.**

A nursing error was defined as any wrongful decision, omission or action for which the nurse felt responsible and that had adverse or potential adverse consequences for the patient and that would have been judged wrong by knowledgeable peers at the time it occurred.

#### **6.1.2. Exclusion criteria.**

Medication errors were excluded in this study, the rationale being medication errors are already well researched whereas there is a dearth of studies on the "other" types of errors that nurses make.

The operational definition of a nursing error as well as the exclusion criteria were included in the letter accompanying the questionnaires which were distributed to the participants.

## **6.2 Method.**

### **6.2.1 The sample.**

The sample selected for this study was 175 nurses- 75 nursing staff were selected from ward areas and the other 100 nurses from the day-release "Examining and Assessing Course". The staff were from grade C to I. Most of the participants were in grade D and E (39% and 33% respectively) with only 1.6% in grade C and .8% in grade I. (The meaning of the different grades and their responsibilities are described in appendix I). This is roughly representative of nurses belonging to these grades in the clinical areas. All the staff from the ward areas worked for a specific NHS trust whereas the staff on the "Examining and Assessing Course" were from four different trusts. Their nursing experience ranged between six months and twenty five years. The participants were overwhelmingly female (91%) and reflected the normal ratio women-men in general nursing.

### **6.2.2 Procedures.**

Seventy five questionnaires were distributed to a representative sample of nursing staff on a number of wards covering the main specialities in a District General Hospital. A letter accompanying the questionnaire described the main aims of the study and assured of anonymity and confidentiality. The nurses were asked to leave the completed questionnaire in a sealed envelope marked "Private and Confidential" in a special location where they were collected by the researcher. The other 100 questionnaires and accompanying letters were distributed to staff members on the "Examining and Assessing Course" during course time following a brief introduction of the aims of the study. They were given 30 minutes of course time to complete the questionnaire and it was made clear to them that their

participation was voluntary and that they could opt out if they so wished. Only five elected to do so. After completion of the questionnaire, they were asked to put it in a sealed envelope which was then collected.

### **6.2.3 The questionnaire.**

The 22-item questionnaire is a modified version of the one developed by Wu et al (1991) for their study of medical mistakes. The items related purely to medical work were removed and replaced by "nursing" items. The revised questionnaire was then piloted with a group of 20 nurses, who were also invited to write comments about the questionnaire. From the responses obtained, further modifications were made to the questionnaire. Ambiguous items or items which the participants found to be irrelevant to the nursing context were either removed or altered. The title of the study on the questionnaire was changed from "Nursing Errors" to "Inappropriate Nursing Decisions and Actions" as some of the participants were associating the term "Nursing Errors" mainly with "Medication Errors" which was not the object of this study. In the redesigned questionnaire, the positive aims of the study were emphasised, i.e., to find out how nurses can learn best from their errors and make constructive changes in practice.

The questionnaire was divided into the following sections:

- (a) First, the participants were asked to describe a critical incident about an error they had made in the process of giving care. Subsequent sections were related to that critical incident as follows:
  - (b) When the error occurred
  - (c) Years of experience in nursing when the error was made
  - (d) Approximate age of the patient at the time of the error
  - (e) Type of ward in which the error took place
  - (g) The patient's overall level of functioning prior to the error. Four levels of functioning were described as follows:

## *Chapter 6: Types of nursing errors and their perceived causes*

\* Fully functioning means that the patient is self-caring (i.e. is independent in all his activities of living). The main input from the nurses are:- giving advice/health education as required, administration of drugs or other specific interventions and some monitoring of the patient's physiological status.

\* Mildly compromised functioning means the patient is dependent on the nurse for some specific activities, but otherwise is mostly independent and requires only some monitoring of physiological status..

\* Moderately compromised functioning means that the patient needs to be closely monitored because of potential complications of condition. The patient can carry out certain activities, but will require some assistance and/or supervision from the nurse

\* Severely compromised functioning means that the patient is very ill and is completely dependent on the nurse for all his care.

(h) The participant then had to indicate whether the patient was very severely, severely, moderately, mildly or unaffected by the error.

(i) Six statements were concerned with perceived causes of the error, anchored by a four point Likert scale.

(j) Eight items were statements describing the error, anchored on a four point Likert scale. Four of these statements were based on Reason' s classification of errors into slips, lapses and mistakes and the other four were concerned with professional issues of accountability and responsibility.

(k) Four items were concerned with ward atmosphere (local circumstances) at the time of the error, anchored on a four point Likert scale.

(l) The immediate emotional reactions to the error were measured by five statements, anchored on a four point Likert scale.

(m) One question was concerned with whether or not the nurse talk to someone about the error. If the nurse responded affirmatively to the question, she/he had to identify the person(s) she/he talked to from a list provided.

(n) The ways of coping scale developed by Folkman and Lazarus (1988) was used to assess coping strategies the nurse used in response to the error. Six coping four point scales were used: accepting responsibility (1 item), self-controlling (3 items), seeking social support (3 items), planful-problem solving (2 items), distancing (3 items), and escape-avoidance (2 items).

(o) Discussion of the error with senior staff was assessed by three categorical response items, i.e., whether they discussed the error with senior staff, whether they were counselled (admonished) for the error and whether they were disciplined for the error.

Responses to discussion of error with senior staff were measured by six items, anchored on a four point scale.

(p) Two scales asked nurses how they changed their practice in response to the error. The first scale contained 10 items which measured constructive and defensive changes. As the constructive (six items) and defensive (four items) scale measured separate concepts rather than the polar opposites of the same scale, nurses might report both constructive and defensive changes in practice. The statements relating to constructive changes all appear to be related to each other and it was possible to group them. However, it was found necessary to differentiate between three types of defensive changes due to the fact that they might have different implications for practice. They were anxiety/loss of confidence in one's work, keeping an error to oneself and not trusting others..

The second scale asked the nurses whether they changed their practice a little, quite a bit, a great deal or not at all.

(q) The last sections of the questionnaire were concerned with demographic information, i.e. marital status of the nurse, gender, present post and grade at time of error.

A copy of the questionnaire is found in the appendix 2.



### **6.3 Results.**

Of the 175 nurses surveyed, 145 (83%) responded by completing the questionnaire. However, 16 questionnaires were discarded as the participants did not write a critical incident describing the error, although they did complete the rest of the questionnaire. This left 129 (74%) valid questionnaires for analysis.

#### **6.3.1 Types of errors.**

The errors which the nurses had described in their critical incidents were classified into two types: nursing and psychological, i.e. the errors were looked out from a nursing point of view, then the same errors were looked out from a psychological perspective. Thus, the errors were first examined to ascertain the stages of the process of care where the error occurred. Then the errors were examined to identify the types of cognitive mechanism (i.e. slips, lapses or mistakes) which were thought to have produced them.

##### **6.3.1.1. Nursing classification of errors.**

From the participants' description of the critical incident of their error, the errors were classified into four types. One type was related to errors which occurred primarily as a result of faulty communication in the process of care. These were called errors of communication. The other three types were based on the stages of the nursing process where the error occurred: assessment and planning, intervention or evaluation. Thus, they were described as errors of assessment and planning, errors of intervention and errors of evaluation.

Most errors (33%) occurred during intervention. For example, a staff nurse on night duty was called over by a bank nurse to a patient with diabetic ketoacidosis because the "bung" had come off one connection of a giving set. The staff nurse put another "bung" without realising the insulin infusion (which was in the same

line) had become disconnected. The patient went without any insulin for the whole night, and his blood glucose was very high the next morning.

Nurses reported errors of assessment and planning in 27.9 % of cases. A senior midwife was called to check a vaginal examination which was unclear to the junior midwife. The senior midwife diagnosed a "face" presentation and duly prepared for her delivery. Late in the second stage of labour, the midwife realised it was an undiagnosed breech delivery, and it was too late to get medical aid. Fortunately, the baby was delivered successfully.

Errors ascribed to faulty communication were described in 27.9 % cases. In one case, an E grade nurse rang the wrong relative about a patient who was very poorly. The relative came in very worried, and lodged a complaint when she found out about the mistake.

Only 10.1 % of the nurses reported errors of evaluation. For instance, a D grade nurse was looking after a patient post-operatively following a major surgery. The patient was losing a lot of blood from the drains. Although she recorded it in the fluid balance chart, she failed to appreciate the implications of this complication and did not report it to anybody. Later on, the patient was discovered to have become severely hypotensive. The patient died two days later, although the hypotension was not thought to have been the cause of his death.

#### **6.3.1.2. Psychological classification of the errors.**

The psychological classification of errors are based on Reason's (1990) taxonomy of error and correct performance, i.e. the mechanism by which an action deviates from intention. Reason proposes three types of errors: slips, lapses and mistakes. Slips and lapses are execution errors, with slips being observable as "actions-not-as-planned" and lapses are more covert error forms involving failures of memory.

Mistakes result from deficiencies in the plan. For instance, errors were classified according to whether they occurred at the cognitive or executive stages of the nursing intervention. If the plan of action was faulty at the planning (or cognitive) stage because of lack of understanding of the problem and of what was required, it was classified as a mistake. On the other hand, if the error occurred during delivery of care (i.e. executive stage), it was classified as either a slip or a lapse according to whether the nurse carried out the wrong intervention (i.e. intervention-not-as-planned or slip) or forget to carry out a particular planned intervention (i.e. a memory lapse).

Slips and lapses comprised the majority of the errors (68 %). Thirty nine percent of the errors (39 %) were of the "slips" type. For example, a D grade nurse made an entry in the wrong patient's notes regarding an instruction to catheterise a patient and as a result the wrong patient was catheterised.

"Lapses" occurred in 29 % of cases. In one case, an E grade nurse forgot to start a patient's blood transfusion before she finished her shift and it was not until 4 hours later that she remembered, but fortunately when she rang the ward somebody else had found the regime and had commenced treatment, although this resulted in a delay in the patient's treatment. Another nurse (a D grade) did not replace a cot-side after she had attended an elderly patient. As a result, the patient fell out of bed and sustained a fracture of the neck of her femur.

"Mistakes" were made by 32 % of the nurses. A 48 year old man who had a history of alcoholism complained to an E grade nurse that he was having chest pain. The E grade nurse told him that it may be due to an inflammation of his stomach and that she would mention it to the doctor when he came to do his round later. About an hour later, the patient had a cardiac arrest and the

emergency team had to be called. Fortunately, they managed to resuscitate the patient and he was transferred to the coronary care unit.

### **6.3.2 Consequences of nursing errors to patients.**

Sixty four percent of nurses (N=81) reported that their error had some consequences to the patients; the remaining errors had no effect. Of those nurses who admitted that their error had affected their patients, 28 % (N=36) reported that their error had mild effect on their patients. Twenty three percent (N=30) and 11.7 % (N=15) reported moderate and severe effects respectively. Before the error, almost half (48%) of the patients were "fully functioning", requiring minimal level of care. Twenty percent (N=26) had "mildly compromised functioning". Sixteen (N=21) and 15 % (N=20) had "moderately" and "severely" compromised functioning respectively.

### **6.3.3 Perceived causes of the error.**

Most participants primarily attributed their errors to more than one cause. Causes of error were attributed to inexperience (lack of knowledge/information), lack of supervision, job overload, faulty judgement, stressful ward atmosphere, insensitiveness of senior staff and violations (e.g. taking short-cuts), the most prominently reported causes being stressful ward atmosphere (79 %), job overload (65.9 %), inexperience (63.2 %) and lack of supervision (57.6 %). The results are shown in table 6.1.

**TABLE 6.1 Perceived causes of errors.**

<b>Causes</b>	<b>Number</b> (agree strongly/agree somewhat)	<b>%</b>
<b>Inexperience.</b>		
Unfamiliar with the procedure.	26	21.1
Didn't have the information I should have known.	51	42.1
<b>Lack of supervision.</b>		
Though I was responsible someone else made the error.	43	33.2
Supervision by senior staff was inadequate.	33	26.4
<b>Job overload.</b>		
I was distracted by having too much on my plate.	83	65.9
<b>Faulty judgement.</b>		
I made my mind up too quickly.	47	37.6
<b>Ward atmosphere.</b>		
The environment on the ward was particularly stressful.	100	77.5
There was bad feeling between the staff on the ward.	22	17
<b>Insensitivity of senior staff.</b>		
Senior staff expected you to get on with the work regardless.	52	40.3
<b>Violations.</b>		
Taking 'short-cut' was almost the norm on the ward/dept.	17	13.2

#### 6.3.4 Initial responses to errors.

The majority of nurses experienced emotional distress in response to their errors. In 73 % (N=94) of cases, the nurses felt angry at themselves. Forty-two percent (N=54) felt angry at other people. Feelings of inadequacy were reported by 46 % (N= 39) of nurses. Thirty-seven percent (N=30) felt fearful of repercussions, and 69 % (N= 60) had guilty feelings. A Pearson's Product Moment Correlation test

was used to determine whether the nurses would feel more distress if the error has caused harm to the patient. There was a highly significant relationship between severity of error and emotional distress, involving both internal responses (feeling angry at self, feeling of inadequacy and guilt) and external responses (feeling angry at others and fearful of repercussions).  
 $R = 0.42, P < .003$   
 $R = 0.39, P < 0.012$

### 6.3.5. Discussion of the error with others.

Ninety percent of the nurses (N= 117) in the study felt the need to discuss their errors with others, mainly their colleagues (68%) and nurse in charge of the ward (45 %). Patients or their relatives were told about the error in 28 % (N= 36) and 27 % (N= 37) of cases respectively. Twenty four percent of nurses (N= 19) also mentioned discussing the error with their spouse or significant other. Doctors were informed of the error in 35 % (N= 45) of cases and nurse manager in 17.8 % of cases (N= 23). Only 2.3 % (N= 3) of nurses consulted their union or professional representative about the error.

#### 6.3.5.1. Reaction from discussion of the error with senior staff (ward sisters/nurse managers).

Sixty six percent of nurses (N= 86) reported to have discussed the error with senior staff. Only 17.1 (N= 22) percent of these nurses reported to have been disciplined for their error. A Spearman's Rank correlation test indicated that there was a positive significant relationship between being disciplined for one's error and being "more likely to keep an error to myself" ( $R = 0.46, p < .0001$ )

Nurses who had discussed their errors with senior staff also experienced a range of emotional reactions. Forty six percent (N= 60) experienced a positive response, the rest reported a range of negative responses. The results are shown in table 6.2.

**Table 6. 2 Reaction of nurses from discussion of error with senior staff.**

Responses	Number (agree strongly/agree somewhat)	%
I felt supported	60	46.5
I felt humiliated	28	21.7
I felt I was used as a scapegoat	16	13.9
I lost professional respect	14	10.8
The real cause of the error was not tackled	49	38
The senior staff over-reacted	5	3.9

### 6.3.6 Coping strategies used by the nurses.

Nurses used a range of coping mechanisms in the aftermath of their error, most of them being positive. Fifty six percent (N= 73) reported to be willing to accept responsibility for their error. They were also positive as to their future course of action, and they reported that they would take steps to make them less liable to make errors again (e.g. 40.3 % "made a plan of action and followed it" and 62 % "knew what had to be done, so I doubled my efforts"). Some nurses used "self-controlling" strategies to enable to help them to "manage" (e.g. 33 % "tried to keep feelings to self" ; 48 % "did allow feelings to interfere with work" and 18 % "kept others from knowing how bad things were"). Some nurses felt they needed support in the aftermath of the error. They "accepted sympathy and understanding from someone" (21 %) and "talked to someone about how they were feeling" (25%) or "asked a relative or friend they respected for advice" (18%). A smaller number of nurses resorted to negative coping strategies such as "distancing" ("went on as if nothing happened"- 16%; "trying to forget the whole thing"-13.2

% or "refusing to think about it"-11%) and "escape-avoidance" ["wishing the whole thing would go away" (32%) and "had fantasies about how things might turn out" (23 %)]. The results relating to the coping strategies used by nurses are found in table 6.3.



**Table 6.3. Coping strategies nurses used in response to their errors.**

<b>Coping strategies</b>	<b>Number</b> (Agree strongly/agree somewhat)	<b>%</b>
<b>Accepting responsibility.</b>		
I criticised or lectured myself.	73	56.6
<b>Self-controlling.</b>		
I tried to keep my feelings to myself.	41	31.8
I did not allow my feelings to interfere with my work.	60	46.5
<b>Seeking social support.</b>		
I accepted sympathy and understanding from someone.	31	24.1
I talked to someone about how I was feeling.	59	45.7
I asked a relative or friend I respected for advice.	24	18.6
<b>Planful problem solving.</b>		
I made a plan of action and followed it.	52	40.3
I knew what had to be done, so I doubled my efforts.	80	62
<b>Distancing.</b>		
I went on as if nothing happened.	20	15.6
I tried to forget the whole thing	17	13.2
I refused to think about it.	14	10.8
<b>Escape-avoidance.</b>		
I wished the whole thing would go away.	41	31.8
I had fantasies about how things might turn out.	29	22.5

### **6.3.7. Changes in practice.**

Eighty percent (N= 103) of nurses reported some changes in practice as a result of the error. This ranged from changing the practice only a little (37%) to quite a bit (28%) and to a great deal (16%). Some of these changes were of the constructive kind; others were defensive. Cronbach alpha (named after the psychometrician who first reported it in 1951) was used to measure the internal consistency reliability of the constructive and defensive changes in practice. Internal consistency is a psychometric measure used in assessing survey instruments and scales, and it "is applied not to single items but to groups of items that are thought to measure different aspects of the same concept" (Litwin, 1995). Thus, internal consistency is an indicator of how well different items in a questionnaire measure the same issue. It is generally accepted to be adequate if the Cronbach's alpha is over 0.7 and correlations between items and total is over 0.4. The variables which measured constructive changes were group together because of their clinical homogeneity as well as their good internal consistency (Cronbach alpha= .76). The item-total correlation of the constructive changes variables is over 0.4. These indicate that the constructive changes variables were measuring the same concept. The defensive changes variables were separated into three types of defensive changes (defensive change1, defensive change2, defensive change3) as they appeared, from a clinical point of view, to reflect different aspects of defensive practice. For instance, the variables "less confident" and "getting more worried" were grouped together to form defensive change1 as they seem to measure the same value. However, the variables "more likely to keep an error to oneself" (defensive change2) and "less trusting of others" (defensive change3) appear to represent different aspects of defensive practice and may also lead to different clinical implications. For example, not reporting an error may put the patient at risk and also has an ethical dimension. "Being less trusting" of others may affect team work and management of case loads, but may also be regarded as a constructive change in the sense that the nurse may

supervise her/his colleagues more diligently to ensure that the work is being carried out correctly. Cronbach alpha for the defensive changes variables was 0.6, indicating relatively lower internal consistency. The type of changes that the nurses reported to have made in their practice are shown in table 6.4.

**TABLE 6.4 Constructive and defensive changes in practice.**

Types of changes (Scale 1-4)	Number (Agree strongly/agree somewhat)	%
<b>Constructive changes</b>		
Paying more attention to detail.	108	84.7
Keeping better records on patients.	68	51.5
Reading patients' notes/ plan more carefully.	67	53.6
Asking colleagues what they would have done in similar situation.	64	51.2
Seeking advice.	61	48.8
Doing more observation on patients.	51	41.2
<b>Defensive change 1.</b>		
Getting more worried.	45	35.7
Feeling less confident in my work.	27	21.8
<b>Defensive change 2.</b>		
Being more likely to keep an error to myself.	22	17.5
<b>Defensive change 3.</b>		
Being less trusting of other colleagues.	43	34.4

### 6.3.8 Factors relating to changes in practice.

Both bivariate and multivariate analyses were used to examine how predictor variables were related to reported changes in practice (constructive and defensive changes in practice).

Pearson's product correlations were used to assess whether there was a significant relationship between a number of predictor variables and constructive and defensive changes in practice. The results are displayed in table 6.5. Inexperience (i.e. lack of knowledge and not having the relevant information) and work overload were significantly associated with constructive changes in practice.

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Errors which were caused by faulty judgement, work overload and stressful atmosphere were significantly associated with defensive change 1 (i.e. loss of confidence and increased anxiety). Lack of support from senior staff and insensitiveness of senior staff were significantly associated with defensive change 2 (i.e. more likely to keep the error to oneself). Severity of error was found to be significantly correlated with constructive changes in practice, defensive change 2 and defensive change 3.

The types of emotional responses (internal and external responses) to the error as well as the coping strategies used in the aftermath of the error were found to be significantly related to reported changes in practice. The time span for the occurrence of these two types of psychological reactions to the error may be different, with emotional reactions occurring immediately after the error and coping responses in the hours and days in the aftermath of the error.

All the results are displayed in table 6.5.

**TABLE 6.5. Correlation of causes of error, circumstances of error, severity of error, coping strategies, and responses to error with constructive and defensive changes in practice.**

Factors	Constructive changes 1 @	Defensive change1@	Defensive change2 @	Defensive change3@
<b>Causes.</b>				
Inexperience.	.26*	.05	.16	.15
Work overload	.20*	.30**	.16	.24*
Faulty judgement.	.16	.26*	.09	.34**
<b>Circumstances</b>				
Stressful atmosphere.	-.20*	.19*	-.06	.17
Insensitive staff.	.26*	.17	.19*	.26*
Unsafe work practices.	.12	.12	.32**	.19
<b>Severity of error.</b>	.21 **	.18*	.22 **	.26**
<b>Coping strategies.</b>				
Accepting responsibility.	.43**	.42**	.18	.32**
Distancing.	.20*	.04	.41**	.17
Self-controlling.	.32**	.42**	.38**	.40**
Seeking social support.	.45**	.23*	.14	.36**
Planful problem solving.	.31**	.06	-.01	.34**
Escape avoidance.	.30**	.58**	.18	.44**
<b>Emotional responses.</b>				
Internal responses(feeling angry at self, guilty, inadequate).	.36**	.34**	.04	.14
External responses(feeling angry at others, fearful of repercussions)	.18	.28**	.09	.32**
<b>Senior staff responses.</b>				
Supporting.	.29*	-.08	-.29**	-.15
Treat unfairly.	.31*	.38**	.21*	.41**
Cause loss of self-esteem.	.23*	.27**	.23*	.33**

@ = These categories are illustrated in table 2.

\* p < .05 \*\* p < .01

N.B.: The problem of type I error must be taken into account, especially when multiple comparisons are made. In type I error, we reject the null hypothesis when it is true. The probability of making a type I error can be reduced if a more stringent level of significance is used (e.g. 1 % rather than 5 %). In table 6.5, a large number of the p values are less than 0.01, but there are still a number of p < 0.05. It is also important to be aware that by reducing the chances of type I error, we increase the likelihood of making a type II error (i.e. when no difference is found between the groups when there is one).

Table. 6.5 shows that internal responses (i.e. feeling angry at self, guilty and inadequate) as well as accepting responsibility were significantly related to constructive changes in practice. There was no relationship between external responses (i.e. feeling angry at others and fearful of repercussions) and constructive changes, but both internal and external responses were significantly related to being less confident and more anxious in one's work ( $p < .01$ ). It can also be seen from table 6.5 that nurses used more than one coping strategies in response to an error. With a few exception, these strategies were significantly associated with both constructive and defensive changes. Accepting responsibility and planful problem solving strategies were positively related to constructive changes whereas "distancing" and "self- controlling" strategies were more related to defensive change 2 (i.e. more likely to keep an error to oneself).

#### **6.3.8.1. Multiple regression analysis.**

In the bivariate analysis, many variables were found to be related to constructive and defensive changes in practice. In order to determine what factors contribute the most to explaining changes in practice, multi-variate analysis was used.

As accepting responsibility for one's error was positively correlated to constructive changes in practice and defensive change1, it was important to determine whether this applied to the total sample of nurses in this study, the reason being 43 of the 129 nurses reported that the error was made by someone else under their supervision and was technically not physically responsible for making the error. These nurses might not accept personal responsibility for the error. Therefore, a preliminary regression analysis was carried out using only the group (N= 43) which did not personally make the error. The results of this analysis revealed that accepting responsibility was no longer a significant factor in predicting changes in practice, but stressful ward atmosphere was a significant

predictor. They were therefore deemed to belong to a separate group. The results are shown in table 6.6.

**Table 6.6 Predictors of constructive changes in practice (in the group that did not personally make the error).**

Predictors of constructive changes	Beta	R <sub>2</sub>
<b>Antecedents of errors.</b>		
Years in nursing	.14	
Lack of knowledge/information	.35*	
Stressful atmosphere	.59**	
Job overload	.007	.48
<b>Error severity</b>	.28*	.55
<b>Coping strategies used</b>		
Accepting responsibility	.025	
Distancing	-.11*	
Planful problem solving	.29**	.58
<b>Emotional responses</b>		
Internal responses	.05	
External responses	.008	.60

\* p < .05      \*\* p < .01

Therefore, the analysis reported below applies only to those who were personally responsible for the error (N= 86).

Hierarchical regression was employed to determine if addition of information regarding error severity, coping mechanisms and emotional responses improve prediction of constructive changes in practice beyond that afforded by the background factors (i.e. inexperience, job overload and ward atmosphere). Table 6.7 displays the results of the regression analysis at various steps.

**TABLE 6.7 Predictors of constructive changes in practice.**

Predictors of constructive changes	Beta	R <sub>2</sub>
<b>Antecedents of error.</b>		
Stressful atmosphere.	.08	
Years in nursing	-.05	
Lack of knowledge/information.	.33**	
Job overload.	.12	.11
<b>Error severity.</b>		
Patient unaffected.	.24	.13
<b>Coping strategies used.</b>		
Accepting responsibility.	.39*	
Planful problem solving.	.26*	
Seeking social support.	.19*	
Self-control.	-.06	.43
<b>Emotional responses.</b>		
Internal responses(i.e. angry at self, guilty, feel inadequate).	.17	
External responses (i.e. angry at others, fearful of repercussions)	-.05	.45

\* p < .05 \*\* p < .01

Background factors such as inexperience (lack of knowledge/information), job overload and ward atmosphere were entered first, but only inexperience proved a significant predictor. Severity of the error was then entered, followed by coping strategies and emotional responses. Coping strategies at step 3 are significant predictors of constructive changes.

The same technique was used to assess the influence of selected variables on defensive changes 1 and 2 , the selection being based on variables which were found to be significant in the Pearson's correlation analysis. The results of the



multiple regression analyses of defensive changes 1, 2 and 3 are summarised in tables 6.8 , 6.9 and 6.10.

**TABLE 6.8 Predictors of defensive change 1 (more anxious and less confident at work)**

Predictors of defensive change 1	Beta	R <sub>2</sub>
<b>Antecedents of error.</b>		
Faulty judgement .	.23*	
stressful atmosphere.	.27*	
Lack of knowledge and information.	.02	.12
<b>Severity of error.</b>	.12	.13
<b>Coping strategies used.</b>		
Planful problem solving	.002	
Accepting responsibility.	.36**	
Seeking social support.	.15	.29
<b>Emotional responses.</b>		
External responses (angry at others, fearful of repercussions).	.23*	
Internal responses (angry at self, guilty, inadequate).	.15	.35

\* p < .05 \*\* p < .01

**Table 6.9 Predictors of defensive change 2 (more likely to keep an error to myself).**

Predictors of defensive change 2.	Beta	R <sub>2</sub>
<b>Antecedents of error.</b>		
Unsupportive staff.	.19	
Lack of knowledge/information.	.03	
Unsafe working practices	.27*	.15
<b>Severity of error.</b>	.11	.16
<b>Coping strategies used.</b>		
Distancing	.32*	
self-controlling.	.22	.35
<b>Emotional responses.</b>		
Internal (angry at self, guilty, inadequate).	-.13	
External responses (angry at others, fearful of repercussions)	-.18	.39

\* p < .05 \*\* p < .01

**Table 6.10. Predictors of defensive change 3 (less trusting of others)**

Predictors of defensive change 3	Beta	R <sub>2</sub>
<b>Antecedent of error.</b>		
Years of experience in nursing	-.09	
Lack of supervision	.031	
Job overload	.13	
Unsupportive senior staff	.23	
Someone else made the error	-.09	.10
<b>Error severity</b>	.32**	.20
<b>Accepting responsibility</b>	.008	
<b>Self-controlling</b>	.23	
<b>Planful problem solving</b>	.08	
<b>Escape-avoidance</b>	-.03	
<b>Seeking social support</b>	.20	.31
<b>Internal responses</b>	-.06	
<b>External responses</b>	-.02	.31

\*p < .05 \*\* p < .01

Of the background factors (antecedents of error), stressful atmosphere proved a and faulty judgement proved significant predictors of defensive change 1 (more anxious and less confident in one's work). At step 2, error severity was not significant predictor of defensive change 1 and at step 3, accepting responsibility proved a significant predictor. Addition of emotional responses at step 4 did not significantly improve  $R^2$ .

With defensive change 2 (more likely to keep an error to myself), background factors (antecedents of error) and error severity contributed only minimally to the equation, but the use of distancing strategy proved to be a significant predictor.

Emotional responses did not add further to the equation at step 4.

In defensive change 3 (less trusting of others), background factors did not contribute to the equation. However, error severity explained 20 % of the variance of the dependent variable. When coping factors were added at step 3, the  $R^2$  increased to 31. Emotional responses did not add further to the equation at step 4.

## **6.4 Discussion.**

### **6.4.1 General findings.**

The findings revealed that errors are common in the delivery of care and often affect patients adversely, but they are not always reported to the management. Nurses are also emotionally affected by their error and they feel the need for support in the aftermath of their error. If the error has led to an adverse event, their emotional distress was greater. However, this may not be fully appreciated by the senior staff and a significant proportion of nurses felt dissatisfied after discussing the error with senior staff. The findings also indicate that nurses were willing to accept responsibility for their error and make constructive changes in their practice. Thus the potential for learning from errors is there.

#### **6.4.2 Types of errors.**

When using the nursing process, nurses commonly make errors during the assessment/planning of care and nursing intervention stages, and to a smaller extent in the evaluation of care. Failures of communication are also important sources of errors. These findings support the Health Service Commissioner's (1987) concerns about nursing staff apparent difficulties in using the nursing process effectively and the quality of communication in health care delivery. In fact, in his conclusions, the Health Service Commissioner also made allusions of the fact that inability to use the nursing process correctly may be responsible for a "catalogue of errors" in nursing practice.

The findings also indicate that most of the errors which occurred during the process of care and in communication were the result of slips and lapses, although mistakes too play an important part. According to Reason (1990) slips and lapses are monitoring failures and occur because of a lack of timely attentional check. They are unintended acts. Mistakes, on the other hand, occur because of lack of knowledge or misinterpretation of a situation. They are errors of intention. A variety of factors such as work overload, stress, fatigue and interpersonal relations may cause slips and lapses. Therefore, the high occurrence of slips and lapses might suggest that these factors may be present in the nurses' working environment and may be affecting their performance. These have important implications in error-prevention strategies. In nursing, correct delivery of care is often contingent on the nurses remembering to do so. But this may be unreasonable to expect on a busy ward with staff shortages; the attention of the nurse may be divided between many tasks. Errors and failures may be inevitable in these situations. Reason has suggested that a system approach should be used to deal with errors such as slips, lapses and mistakes rather than an individual approach.

### **6.4.3 Perceived causes of errors.**

The findings suggest that nurses perceived that many factors may be involved in the causation of errors. The most common reported causes of errors were stressful atmosphere, job overload, lack of knowledge or experience and inadequate supervision and support from senior staff. From these findings, it could be suggested that the climate in which the nurse has to work may be becoming more stressful and demanding, particularly in line of the rapid changes in the NHS and the market approach to health care. In fact, the Audit Commission (1996) reported a 16 % increase in emergency admissions, the brunt of this increased workload falling heavily on the nurses. In fact, work overload and stressful atmosphere are particularly perceived to be important causes of errors by nurses in this study. These may be creating working conditions that predispose to a variety of active failures (Reason, 1990).

### **6.4.4. Reporting of nursing errors.**

There is evidence in this study that the nurses were reluctant to discuss their error to the senior staff. Yet, the majority felt the need to discuss their error with someone, presumably because of the stress associated with making a clinical error. The implications of not discussing the error with the appropriate personnel could affect patient care. For instance, since not all errors were reported to senior staff, they may not be fully aware of the "safety health" of their unit or the system's contribution to these errors. As a result, appropriate preventative measures may not be taken, and certain types of error-producing conditions may perpetuate in the system. Although the nurses were more willing to discuss their errors with the doctors, the doctors were still informed only in a small proportion of cases. This may deny the patients of any medical intervention or investigation that may be required as a result of the error. Patients and their relatives were also inadequately informed about mistakes that may have occurred in their care. This could lead to a lack of trust in the health care professions. It has also been found

that patients are more likely to sue for negligence when they have not been given adequate information about mistakes in their care (Vincent, 1994).

#### **6.4.5 Responses to errors.**

In most cases of error, the nurse became emotionally distressed. Giving safe care to patients tend to be an overriding concern for nurses (Hibberd and Norris, 1992). Two types of emotional responses were prominent- internal and external responses. In internal responses, the nurse feels angry at herself/himself, guilty and inadequate. There is evidence that these type of reactions are associated with taking responsibility for the error. What this may mean is that when a nurse takes responsibility for an error, she/he may initially react negatively towards herself/himself for having made the error in the first place, but subsequently take measures to ensure that similar errors are not repeated. Those nurses who make external responses (i.e. angry at others , fearful of repercussions) are more likely to adopt defensive changes in practice in terms of becoming less confident and more anxious in one's work or not reporting their errors. If the lack of confidence and increased anxiety are not recognised and dealt with appropriately in the aftermath of an error, they may affect the nurses' self-confidence and inhibit learning. There is also a danger that those nurses are more likely to make another error when being in this frame of mind.

Making an error may affect one's image of being competent (Arndt, 1994) and senior staff need to respond sensitively. After an error, nurses felt the need for support and most of them approached their colleagues for it, but few went to their managers. Indeed, Arndt (1994) argues that when an error is made, it is "important for staff to be reassured of their professional qualities". It is likely that the traditional approach of disciplining/admonishing nurses in all cases of error may not <sup>be</sup> the most effective strategy for managing errors and may be discouraging

some staff from seeking support or from divulging their error, which could have negative consequences for their practice.

#### **6.4.6 Changes in practice.**

The potential for nurses to learn from their errors are there. The majority of nurses admitted to making some changes to their practice as a result of their error. Making constructive changes in practice may promote the delivery of safer care and also help to increase the general standard of care. The study suggests several factors are associated with making changes in practice. Accepting responsibility for the error are shown to be prerequisites for making constructive changes in practice, and only nurses who have personally made the error tend to show this response. It is therefore important to encourage nurses to accept responsibility for their error and to think objectively about how to ensure that future errors are minimised. In fact, those nurses who accepted responsibility for their errors also reported to make plans to ensure that they do not make a mistake again. This is in line with the professional ethos of the nurses: to be responsible and accountable for one's actions and to maintain one's level of clinical competence. The findings also show that those staff who tend not to divulge their error were unlikely to plan a course of action to deal with the after effects of the error. These staff were also found to be concerned about possible repercussions. It is possible that this type of defensive and unsafe behaviour may be the result of perceiving senior staff as insensitive and unsupportive, hence not trusting the senior staff to understand their predicament and treat them fairly.

The perception of causes of errors as well as the circumstances leading to the error were also associated with changes in practice. Potentially changeable factors such as lack of knowledge/experience and work overload were more likely to lead to reported constructive changes in practice than more internal causes such as faulty judgement. But this will be further investigated in chapters

8 and 10 as causal perception of an event are known to influence the type of reactions to that event (Kelley and Michaela, 1980).

### **6.5 General implications.**

The measures that can be taken to reduce the incidence of errors in nursing practice and the potential for learning from errors will now be discussed briefly. These will then be further expanded in the concluding chapter.

#### **6.5.1 Supervision and support.**

The issue of lack of supervision and support for trained staff, which were perceived as important sources of errors, must be addressed. Supervision of trained nurses has always been weak link in the management of patient care in the health service. Until very recently, it has been generally accepted that once a nurse receives her/his registration, she/he becomes immediately responsible and accountable for her/his action, and is expected to make important decisions in patient's care often without recourse to more experienced colleagues.

#### **6.5.2 Updating of knowledge and skills.**

A second measure that needs urgent consideration is how best to update nurses' knowledge and skills. Findings from this study point to a deficiency in this areas. There is a need for a stronger linkage between supervision and professional updating where needs of individual nurses can be better ascertained. This issue will be further investigated in chapter 9.

#### **6.5.3 Addressing the causes of errors.**

The majority of nurses in this study perceived external factors (e.g. stressful atmosphere, high work load , lack of support) to be important contributory causes to their error. Causal attributions are known to influence behavioural reaction to a negative event. It is therefore important to understand more fully what causal



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attributions nurses use to explain causes of errors and other deficiencies in care before implementing measures to manage errors and inadequacies in care. Mitchell and Wood (1980) also argue that managers should focus less on the "outcome" (i.e. the error) and more on the causes and circumstances leading to the error.

The chapter has reported the types of errors that occur during the process of giving care to patients and the perceived causes of these errors as well as responses of nurses to them were investigated. The causes of errors were found to be multi-factorial. The results also highlighted the factors that predict changes in practice in the aftermath of an error.

The next chapter will examine the assessment of patients admitted with chest pain, more particularly to develop a questionnaire to audit the assessment of patients with chest pain. The aim is to identify potential factors in the nurses' method of work which may predispose to active failures (errors) in the assessment and care of patients with chest pain.

## **CHAPTER SEVEN: THE DEVELOPMENT OF AN AUDIT QUESTIONNAIRE TO INVESTIGATE THE FREQUENCY OF OMISSIONS IN THE ASSESSMENT OF PATIENTS WITH CHEST PAIN.**

### **7.1 Introduction.**

The previous chapter provided some evidence that errors in nursing care may occur at any of the four stages of the nursing process, errors of assessment/ planning and intervention being particularly quite common. Assessment is a crucial aspect of the nursing process involving a search for relevant and precise information about the patient's clinical condition with a view to arriving at a diagnosis, i.e. identification of the problem(s). Pagana and Pagana (1990) argue that nurses use specific assessment data to make nursing diagnoses as well as identifying collaborative problems. They define nursing diagnoses as problems that nurses can deal with through independent nursing interventions whereas collaborative problems are potential complications arising from the disease or treatments that can be prevented or resolved through collaboration with the physician. Thus, nurses not only have a responsibility to identify "nursing" problems but also signs of complications or potential complications which would need to be reported to the physician. An inadequate assessment of a patient may result in a poor care plan, and may also affect the quality and safety of nursing care.

Cardiac chest pain is a common reason for admission to hospital. The chest pain may be a symptom of cardiac ischaemia (angina) or actual blockage of the coronary artery (myocardial infarction). On admission, it is not always possible to differentiate whether the chest pain is caused by angina or myocardial infarction. It is also possible that a patient may be admitted with angina and then develop myocardial infarction. Thus, all instances of acute chest pain should be considered as serious and life threatening. Since complications in the form of dangerous arrhythmias and shock are more common during the first 48 hours

following the initial cardiac chest pain, it is crucially important that patients are thoroughly assessed on admission and that the assessment needs to be repeated frequently as the patient's condition may change rapidly. Thus, cardiac chest pain is a good illustrative condition to depict the way nursing process should be used in the care of a patient, and the consequences of not following all the stages of the nursing process in a systematic way. For instance, failure to identify or to report/record critical changes in the condition of a patient with chest pain would mean that actions required to resolve these problems may not be taken or be delayed, hence putting the patient at risk or giving substandard care to the patient.

#### **7.1.1 Core criteria for assessment of patients with chest pain.**

When assessing patients with chest pain, nurses evaluate the patients' presenting complaint and current physiological manifestation of the condition to enable them to decide what to do (Jacavone & Dostal, 1992; Corcoran-Perry & Graves, 1990). Crow et al (1995) also argue that assessment forms the basis of decision making; knowledge and expertise are crucial in this process (Webster & Thompson, 1992). In order to assess patients effectively, the nurse needs to have specific and relevant knowledge to "zero on the most relevant symptoms" (Jacavone & Dostal, 1992). This is referred to as domain-specific knowledge, i.e. cognitive strategies required to gather and organise information (Norman et al, 1987). For example, cardiovascular nurses collect general information about the patient's condition "to get a general picture of the patient to plan the provision of care" (Corcorran-Perry & Graves, 1990). Jowett and Thompson (1995) argue that much of the nurses work with chest pain involves a high degree of medical and technical expertise, incorporating the collection and recording of clinical data and taking prompt and appropriate action. Implicit in the holistic or "gestalt" approach nurses use in the assessment of patients is the ability to recognise relevant from irrelevant cues (Baumann & Bourbonnais (1984). Assessment of patients with chest pain also needs to be repeated frequently, and Zander (1988)

has suggested that the use of a critical pathway for patients with chest pain may enable this to be carried out at different stages during the patients' stay in hospital.

Panzer et al (1991) state that the probability of significant coronary disease can be predicted on the basis of the person's age, sex and characteristic of pain. In angina, the chest pain is typically substernal. It is brought on activity and relieved by rest. The patient's age, the timing and duration of the chest pain, radiation of the chest pain, associated sweating, and history of coronary heart disease are significantly related to myocardial infarction (Goldman et al, 1982). When assessing a patient with suspected coronary heart disease, the history of the present complaint, previous medical history, current medication, general appearance, characteristic of pulse rate, BP, oedema, dyspnoea, cyanosis, ECG changes and type of pain must all be recorded (Lumley & Bouloux, 1994; Drake et al, 1997). It has also been argued that nurses can use their clinical knowledge and skills to identify those patients who have suffered a myocardial infarction, thus enabling them to receive immediate thrombolysis (Albarran & Kapeluch, 1994). In an audit of thrombolysis in the elderly patients, Hendra and Marshall (1992) found that nursing staff usefully influenced treatment, by their thorough assessment of patients with chest pain and accurate interpretation of ECG changes, identifying those patients to the doctor who had a myocardial infarction and enabling thrombolysis treatment to be started in the immediate stage following a myocardial infarction when it is expected to be most effective.

In the first 24 hours following admissions, most potential high risk problems such as recurrent chest pain, left ventricular failure, cardiogenic shock and severe arrhythmias may be identified, which may require adjustment to the care and mobilisation plan (Jowett & Thompson, 1995). This requires accurate and continuous assessment. Raised anxiety levels are also common in coronary

patients, particularly at the initial stage of the chest pain and admission, and this would need to be assessed so that intervention could be specifically tailored at the patient's needs (Jowett & Thompson, 1995).

The effects of lifestyle and habits on the aetiology of coronary artery disease and on rehabilitation following its diagnosis are well recognised. Thus, demographic variables, patient's knowledge about his condition, lifestyles and habits and other known risk factors such as smoking, dietary fats, obesity, stress, alcohol abuse and hypertension would need to be assessed (Jowett & Thompson, 1995; Drake et al, 1997). These assessment strategies are quite complex and not all nurses may be equipped with the necessary skills and knowledge to carry out an effective assessment of a patient.

### **7.1.2 Aims of the study.**

The study has two broad aims:

- 1) To develop an audit questionnaire to evaluate the quality of assessment of patients with chest pain.
- 2) To identify the type and frequency of omissions in the assessment record of patients with chest pain.

### **7.1.3 Operational definition.**

In this study, chest pain is used as a diagnostic umbrella for angina and myocardial infarction and not just the cardiac pain.

## **7.2 Method.**

The assessment records of thirty patients, whose age ranged from 43 to 70, were selected for this study. The main criteria for selection were :

- \* The patient had been provisionally diagnosed with chest pain (i.e. angina or myocardial infarction).

- \* The patient was aged between 40 to 70 years old
- \* The patient had been in hospital for at least 48 hours
- \* The patient was not confused
- \* The patient was not terminally/critically ill
- \* The assessment was carried out by 30 different nurses

Data were collected over a period of one month by the author from four acute medical wards from the nursing assessment notes of patients who were deemed to satisfy the above inclusion criteria. A questionnaire devised by the author was used to carry out this retrospective audit of patients' assessment record.

### **7.3 The Development of the Assessment Questionnaire.**

The data collection questionnaire (see appendix 3) was designed by the author after analysing relevant medical and nursing literature (see section 7.1.1) relating to the assessment and management of chest pain (i.e. angina/myocardial infarction). The questionnaire was developed in two stages.

#### **7.3.1 Critical care pathway.**

In the first stage, a critical care pathway form for chest pain was designed (see appendix 3). Zander (1988) defines a critical care pathway as a nursing case management tool that shows the exact timing of all key incidents that must occur for a patient to achieve the standard outcomes within the specific length of stay. Thus, the rationale for this initial exercise was to obtain an overall idea about the type of data that should be collected and recorded in the assessment of patients with chest pain as well as identifying the specific care that the patients should receive at various points during their stay in hospital. Once this pathway form has been developed, it was shown to five experienced medical nurses, and they were asked to comment whether the information contained in the form reflected the assessment and care that patients with chest pain should receive. All five nurses agreed that the pathway reflected the care for patients with chest pain. The

pathway was then used by the researcher to check how far the current assessment notes and care plan of ten patients admitted with chest pain match the contents in the care pathway. Although collectively all the information were found within the 10 notes evaluated, a number of omissions were also noted in the patients' notes. But, overall the care pathway did appear to provide an effective map of the care of a typical patient with chest pain and the types of variances that may occur.

### **7.3.2. The audit questionnaire.**

In the second stage of development, the information derived from the care pathway and from the literature review was used to develop a 19-items audit questionnaire relating only to the assessment stage (i.e. excluding nursing interventions, but including all aspects of assessment of patients with angina and myocardial infarction during the first 48 hours). This again was shown to the five experienced clinical nurses so that they could give their comments on the content validity of the questionnaire. They all commented that the criteria contained in the audit questionnaire would be those they would use if they were assessing a patient with chest pain. The questionnaire was pilot tested on ten nursing assessment records of patients with chest pain. The questionnaire was found to be sensitive to the measurement of all the core criteria relating to the assessment of patients with chest pain. No changes were deemed to be necessary before using the questionnaire for the study proper.

The nineteen core criteria relevant to the assessment of patients with chest pain that were included in the audit questionnaire were as follows : Seven criteria concerned the assessment of pain itself (history /development/presentation), five criteria concerned physiological and physical observations relevant to patients with cardiac problems. Two criteria concerned the patient's psychological reaction to his/her condition as well as his/her knowledge of the condition and four criteria assessed lifestyle. The final criteria checked for evidence of

synthesis of assessment information, i.e., identification/listing of problems. The audit questionnaire as well as definition of the criteria is found in the appendix 3.

#### **7.4. Data collection.**

The questionnaire was then used by the researcher in a small pilot study involving 30 patients' records. In ten cases, an experienced nurse also audited the patients' records using the audit questionnaire in order to assess for inter-rater reliability.

The data collection was carried out over a period of one month on three medical wards of one General Hospital Trust. The patients' assessment notes were examined and compared with the criteria in the audit questionnaire to identify and record omissions relating to those criteria. In the patients' assessment notes, the first section contains biographical details (e.g. age, address, next of kin, consultant, named nurse, reason for admission and provisional diagnosis and patients' understanding of their illness). The remainder of the assessment documentation has headings relating to the activities of living model developed by Roper et al. in 1986 (e.g. maintaining safety, breathing, eating and drinking, working and playing etc.- a full list of the activities of living is found in appendix 1). For instance, with regards to patients with chest pain, assessment of the chest pain and related physiological observations will be written under the activity "maintaining safety". Assessment of lifestyles (e.g. smoking pattern, drinking pattern etc.) will come under the activity " working and playing". Thus, the 19 criteria used in the audit questionnaire should be contained within the assessment of these "activities of living".



## **7.5 Validity and Reliability.**

Kaplan (1964) defines measurement as the process of assigning numbers to objects (events or situations) in accord with some rule". A component of measurement is instrumentation. An instrument is selected on the basis of its reliability and validity in the examination of specific variables. According to Burns and Groves (1993), reliability is concerned with how consistently the measurement technique measures a concept under investigation and validity is the extent to which an instrument measures what it purports to measure.

### **7.5.1. Validity of the audit questionnaire.**

Traditionally, the validity of a new measure is assessed by comparing results with those obtained from an established criterion or "gold standard" measure. No such measure was available. Therefore, content validity was sought by asking five experienced nurses to evaluate the care pathway and audit questionnaire as discussed earlier. All five nurses commented that the information or criteria contained in the two forms are relevant in the assessment and care of patients with chest pain. This suggests that the measurement is measuring what it purports to measure (i.e. it has content validity). Litwin (1995) defines content validity as a subjective measure of how appropriate the items seem to a set of reviewers who have some knowledge of the subject matter.

### **7.5.2. Internal consistency of the audit questionnaire.**

The Cronbach's alpha was 0.75 for the audit questionnaire, indicating that the internal consistency was good as it was greater than 0.7 (Streiner & Norman, 1989). Correlations between single items and total ranged from 0.02 to 0.74 for the audit scale (10 out of the 19 criteria exceeded 0.4). From the results of this test, it was decided to replace or combine some of the criteria with poor item-total correlations. For instance, assessment of BP and respiration was combined to form assessment of vital signs, work was replaced by a more clinical criteria (i.e.

permitted activity) and "list of problems" was removed. The scale was thus reduced from 14 to 16 criteria.

### **7.5.3. Inter-rater reliability of the questionnaire.**

The inter-rater (inter observer) reliability provides a measure of how well two or more evaluators agree in their assessment of a variable.

**Table 7.1, Level of agreement between the two raters on the 19 criteria relating to the assessment of patients' with chest pain.**

Criteria	% of agreement between the two raters	Kendall tau b
<b><u>History of development of chest pain</u></b>		
Presenting complaint recorded.	90	0.7**
Past medical history taken.	100	1**
Current medication noted	90	0.8**
History of chest pain recorded.	70	0.7**
Description of chest pain recorded.	90	0.8**
Intensity of pain recorded.	90	0.8**
<b>Physiological and physical observations.</b>		
Association of pain with other symptoms.	80	x
BP taken and evaluated.	70	x
Result of ECG noted	100	1**
Breathing assessment recorded.	90	x
Assessment of general appearance recorded.	90	x
<b>Response/knowledge.</b>		
Psychological reaction to chest pain recorded.	80	0.7**
Knowledge level of patient recorded.	80	x
<b>Lifestyle.</b>		
Smoking pattern recorded.	100	1**
Drinking pattern recorded.	80	0.7**
Dietary pattern recorded.	90	0.9**
Occupation activity recorded.	90	0.9**
<b>Synthesis of problem.</b>		
Problems identified at end of assessment.	90	x

x Indicates kendall tau cannot be computed. \*\* p < .01

Kendall's tau has been chosen for comparing the responses of the two raters because this statistic deals very well with tied ranks. In fact, a visual inspection of the data in table 7.1 indicates a near-perfect agreement between the two raters, and there is likely to be a large proportion of tied ranks. However, the risks of an inflated estimate when a reliability measure which does not control for base rates (as for example Kappa would) is used must be taken into account when interpreting the results.

As shown in table 7.1, the inter-rater reliability of the questionnaire was found to be very high with over 80 % agreement between the two raters<sup>or</sup>, 17 out of the 19 criteria, indicating that the items in the audit questionnaire were consistently interpreted by the two coders. Kendall tau b non-parametric test was used to determine the degree of association between data recorded by rater A and B. The Kendall tau b coefficients (where it can be computed) between the two raters scores ranged between 0.7 to 1, indicating a high level of agreement between the two raters.

## **7.6 Results.**

Of the 30 patients' assessment documentation audited, 53 % (N=16) of the patients were male and 47 % (N=14) female. Their age ranged between 43 to 70, 50 % of patients being 60 years old or below and the remaining 50 % between 64 and 70.

### **7.6.1 Audit of the nursing assessment records of 30 patients admitted with chest pain.**

Overall, the assessment documentation of patients with chest pain was poorly completed and contained a number of omissions. Some criteria were only partially assessed and the information collected may be too superficial to be useful in the identification of problems and planning of care. The results of the audit are shown in table 7.2.

**Table 7.2. Compliance with criteria pertaining to assessment of chest pain.**

Criteria	3	2	1
	Fully met* % (N)	Partially met* % (N)	Not met* % (N)
<b><u>History of development of chest pain.</u></b>			
Presenting complaint recorded.	10 (3)	90 (27)	-----
Past medical history taken.	100 (30)	----	-----
Current medication recorded	10 (3)	-----	90 (27)
History of chest pain recorded.	-----	93 (28)	7 (2)
Description of chest pain recorded	3 (1)	17 (5)	80 (24)
Relationship of pain to activity recorded.	27 (8)	-----	73 (22)
Intensity of chest pain recorded	27 (7)	33 (10)	43 (13)
<b><u>Physiological &amp; physical observations/ complications</u></b>			
Association of pain with other symptoms.	33 (10)	-----	68 (20)
BP taken and evaluated.	-----	96.7 (19)	3.3 (1)
Result of ECG recorded.	6.7 (2)	93.3 (28)	-----
Breathing assessment recorded.	93.3 (28)	6.7 (2)	-----
Assessment of general appearance recorded.	----	-----	100 (30)
<b><u>Response/knowledge.</u></b>			
Psychological reaction to the chest pain recorded.	10 (3)	46.7 (14)	53.3 (16)
Knowledge of condition recorded.	---	66.7 (20)	23.3 (7)
<b><u>Lifestyle</u></b>			
Smoking pattern recorded.	23.3 (7)	3.3 (1)	73.3 (22)
Drinking pattern recorded.	3.3 (1)	3.3 (1)	93.3 (28)
Dietary pattern recorded.	10 (3)	53.3 (16)	36.7 (11)
Occupation and activity recorded.	16.7 (5)	40 (12)	43.3 (13)
<b><u>Synthesis of assessment</u></b>			
Problems identified at end of assessment.	76.7 (23)	23.3 (7)	-----

\* Fully met, partially met and not met are fully explained in the appendix.

#### **7.6.1.1. History of development of chest pain.**

As shown in table 7.1, the assessment of cardiac chest pain was incompletely carried out. Although past medical history were recorded in all cases, yet in only 10 % of nursing notes was the current medication recorded. The pain was not clearly described. Overall, not enough detail was given regarding the background to the development of the chest pain.

#### **7.6.1.2 Physiological/ physical observations and complications.**

The patients' blood pressure (BP) and electrocardiograph (ECG) were recorded on admission in all cases, but not evaluated at all in relation to the patients' clinical state. For instance, no mention was made about the patient haemodynamic state or about any deviation in the ECG pattern .On the other hand, assessment of breathing was recorded in almost all cases (93 %). However, information emanating from the assessment of the patients' physical appearance such as obesity, oedema, cyanosis and presence or absence of physical signs of shock was not recorded at all. In 68 % (N=20) of the notes, no record was made of presence or absence of associated problems such as nausea and vomiting.

#### **7.6.1.3. Psychological responses/knowledge.**

Assessment of psychological reaction to chest pain was recorded only in 47 % (N=16) of cases. Evaluation of the patients' understanding of his/her condition was partially done in 67 % of cases, fully done in 10 % of cases and not carried out in 23 % of cases.

#### **7.6.1.4. Assessment of patients' life style.**

The patients' health behaviour with regards to smoking, drinking, diet and activity was poorly assessed The frequency with which information was recorded on these variables are shown in table 7.2.

#### **7.6.1.5. Synthesis of assessment.**

Following the collection of the relevant data, the nurse needs to sift through them in order to identify what the patients' actual and potential problems are. In the assessment documents audited, it was found that the nurses did summarise their assessment, but in almost all cases only one problem is identified (e.g. the chest pain).

### **7.7. Discussion.**

#### **7.7.1 Initial findings.**

The findings show that the assessment documentation of all 30 patients audited to be inadequate, with relevant information only partially taken or very often omitted. These may have important implications with respect to the type of care that patients diagnosed with chest pain receive and also produce a situation where errors in care are more likely to occur.

#### **7.7.2 Assessment of the pain.**

In almost all cases, the assessment of the cardiac pain was superficial, with little information given about the time of its occurrence and what led to it. The intensity of the pain was also rarely recorded. Although the past medical history of the patients was almost always taken, yet no indication was given about whether or not the patients were currently taking medication for angina or related conditions. As a result, the diagnosis of the condition and prompt commencement of treatment such as thrombolysis therapy may be delayed. Pain is a key warning symptom in ischaemic heart disease. By not monitoring it closely, the nurse may fail to appreciate that the coronary ischaemia may be getting worse and doctors may not be warned about it. Acute chest pain also imposes a strain on the heart by increasing its oxygen needs. This may extend the infarct or even predispose to heart failure.



### **7.7.3 Assessment of physiological status.**

There was also inadequate recording of the assessment of the patients' physiological status. For instance, there was no record about whether the blood pressure taken was normal or not for the particular patient. The pulse volume and rhythm were not commented upon. Although an EEG was always taken, there was no comment in the assessment documentation whether the pattern was normal or not. From the assessment documentation, it was difficult to ascertain whether or not the patient was evaluated for signs and symptoms of haemodynamic disturbance. Since both severe angina and myocardial infarction may exhibit similar clinical features, the lack of comprehensive initial assessment may delay immediate management decisions. Following a myocardial infarction, a number of life-threatening complications may arise. Thus, in the first 48 hours when complications are more likely to occur, the nurse should closely monitor and record the physiological status of the patient to make early detection of signs of impending complications. This would allow treatment to be instituted before the complications become more established and refractory to treatment.

### **7.7.4 Life-style assessment.**

As patients diagnosed with chest pain may require health education directed at informing them of any risky lifestyle which could exacerbate their condition, it is important for the nurses to have knowledge of their present lifestyle, particularly with regards to cigarette smoking, unhealthy diet and lack of activity. However, these information were rarely recorded in their assessment documentation. Latimer (1995) has argued nurses may not necessarily "see" patients objectively as well as holistically in acute medical and surgical wards. They may rather seem to be more concerned with their patients' physical and medical needs than with their psycho-social needs (Morrison, 1989), hence the lack of focus on lifestyles' problems. In this audit, lifestyle's assessment was more poorly carried out than any of the other criteria. It may be that the nurses felt that this was not important

in the initial stage of the patient's acute illness. But, this may delay or even affect the rehabilitation process which is vital for the patient's long term physical and psychological recovery.

## **7.8. Conclusions.**

### **7.8.1. Possible explanations for deficiencies in nursing assessment record.**

Two main explanations could be considered regarding the causes of deficiencies in the assessment documentation. Firstly, nurses may not have enough time to write down a complete assessment of the patient. As a result, they may concentrate more on assessing the patient quickly at an intellectual/subjective level. For instance, it is postulated (e.g. Benner, 1984; Jacovone & Dostal, 1992) that expert nurses assess patients rapidly without apparently much conscious deliberation. Jacovone & Dostal (1992) refer to this as "the ability to zero in on the most relevant symptoms ... she [the nurse] does not need to view each clinical element separately". It could thus be deduced that expert nurses have the ability to link assessment to the identification of the most important problems as well as to what courses of action to take. This may explain their lack of reliance on written record of the assessment. Nonetheless, this could seriously affect continuity of care as it is very unlikely for the same nurse to look after the patient from admission to discharge. It could not be assumed either that all nurses are "expert" and are capable to act in this "intuitive" but competent manner. As a result, there may be important omissions and deficiencies in the care the patients subsequently receive because of the incomplete record of the assessment process. The inability to verify the nurses' judgements in the assessment process through a written record may also lead to failure to detect any shortcomings in the judgements nurses formulate. This may allow errors to slip through.

A second reason for the inadequacy in the assessment record of the patients may be the lack of clinical guidelines for the assessment of patients admitted with

specific conditions such as chest pain. Delamonte (1993) argues that guidelines encourage good practice and thus generate health gain. In medicine, there is increasing evidence that clinical guidelines can cause significant improvement in the process of care (Grimshaw and Russell, 1993). Although the nurses use core care plans for patients with specific conditions/problems, they still have to use a "general" assessment documentation for all patients. As a result, there may be a tendency by some nurses to do minimal assessment once they realise that a particular core plan may be appropriate for that patient. Indeed, findings from the nursing record study commissioned by the Department of Health (1992) indicated a lack of correlation between admission assessment and subsequent care. The study also revealed that there was a lack of detail in the nursing record ; quantitative objective data such as the size of a pressure sore on admission was often omitted, which appears to support the initial findings of this study with regards to the assessment of chest pain.

### **7.8.2 The effectiveness of the data collection questionnaire in auditing the nursing assessment records of patients with chest pain.**

The assessment questionnaire tested in this study has been found to be effective in enabling appropriate data to be collected in relation to the nursing assessment of patients with chest pain, and has allowed some tentative conclusions to be made about the quality of that assessment. In fact, information obtained from the use of this questionnaire has enabled important areas of inadequacies in the assessment of patients with chest pain to be pinpointed, indicating some degree of content validity and possible areas for further studies. The questionnaire is tested on a larger sample in the intervention study described in chapter 11.

The overall findings from this study indicate the quality of the assessment records of patients with chest pain was unsatisfactory. This is line with previous reports relating to the poor quality of nursing records (DHS, 1992; UKCC, 1993; Hale et

al, 1997) and the misapplication of the nursing process (Health Service Commissioner, 1987). These inadequacies may have important implications for the quality and safety of the care delivered to patients with chest pain. These issues will be discussed fully in the final chapter.

In the next chapter, nurses' perception of the causes of these omissions in the assessment of patients with chest pain will be investigated. As discussed in chapter 5, causal explanations of events have an influence on behavioural reactions to these events. Thus, nurses willingness to improve the quality and safety of care they give to their patients may depend on whether they personally feel responsible for the inadequacies in care or they perceive external factors as more important.

## **CHAPTER EIGHT: PERCEPTION OF CAUSES OF OMISSIONS OR INADEQUACIES IN THE ASSESSMENT OF PATIENTS WITH CHEST PAIN.**

### **8.1 Introduction.**

As discussed in the previous chapters, errors and omissions are common in clinical practice. For instance, both the Harvard Medical Practice Study (1989) and the Quality in Australian Health Care Study (1995) reported significant incidence of errors and adverse events in medical practice. The study reported in chapter 6 showed that nurses too made a variety of errors in the delivery of care, particularly errors of assessment, planning, intervention and communication. Furthermore, an audit of the assessment records (reported in chapter 7) of patients admitted with chest pain revealed a number of important omissions. It is conceivable that these omissions may have affected the care of these patients, both in terms of quality and safety.

To improve the standard of care, it is important to take into account the antecedents of errors and other deficiencies in care (Crombie and Davies, 1994). It is now generally accepted that the mechanism of error causation is quite complex, and that an error may result from a combination of factors (Reason, 1990). Reason has also argued that persistent multiple innocuous faults (i.e. latent failures) may create "error-producing conditions" which could then make actual errors (i.e. active failures) more likely to be triggered.

It is however unclear whether nurses recognise these external causes of errors, or whether they perceive them as "internally" generated because of lack of knowledge, fatigue or some other personal characteristics. Perception of causes of a negative event such as an error does influence responses to it (Kelley and Michaela, 1980). These may have an important impact upon how nurses deal

with their errors. For instance, if they perceive external factors to be responsible for an error, they may not see it as within their control to do much about it. On the other hand, if they perceive the error to be "internally" caused, they may be more likely to accept responsibility for it and take preventative action (see chapter 6). In the same vein, if nurses perceive that errors occur infrequently in their practice, it may lull them into a false sense of security, believing that their care is safe and is of acceptable standard. They may be less vigilant in detecting minor omissions or fail to appreciate the cumulative effects of these omissions in their practice. This could endanger the safety "health" of their working environment, creating the conditions for an "accident waiting to happen".

Thus, more appropriate and effective change strategies to correct deficiencies in assessment and care may be introduced if we gain better understanding of nurses' perception of their causes and frequency.

This study aims to address the following questions :

1. Do nurses' perceptions of the frequency of omissions in the assessment of patients with chest pain match those detected in the assessment records?
2. What are the perceived causes of omissions in the assessment of patients with chest pain ?
3. What types of causal attributions do nurses use to explain the causes of their omissions in the assessment of patients with chest pain?

## **8.2 Method.**

### **8.2.1 Design.**

This study is a follow-up from the study reported in chapter 7 on assessment of patients with chest pain. Two weeks after the audit of the assessment records, all the trained nurses working on the medical wards were approached by the researcher over a period of a week and invited to complete a questionnaire

regarding their perceptions of the frequency and causes of omissions in the assessment of patients with chest pain.

### **8.2.2 The subjects.**

The sample selected for this study was 88 nurses from four acute medical wards and the Coronary Care Unit (CCU) of one General Hospital NHS Trust which receive medical in-patients, including patients admitted with chest pain. All trained staff on duty at the time of the data collection were included in the study. The staff were from grade D to G, with 39.8 % (N=35) in grade D, 38.6 % (N=34) in grade E, 15.9 % (N=14) in grade F and 5.7 % (N=5) in grade G. This is broadly representative of the distribution of grades on acute wards. The nurses had between one and 25 years experience between them (mean 9.7 years)

### **8.2.3 Procedures.**

Staff working on both day and night duty were approached individually by the researcher and were invited to participate in this study. After a brief introduction of the aims of this study, the participants were given the questionnaire to complete. They were assured of anonymity and confidentiality and also giving them the option to opt out if they so wished. None of them declined to participate. The questionnaires were collected from the participants within two hours of distribution.

### **8.2.4. The self-report questionnaire.**

The 51-item questionnaire was designed by the researcher for this study, and was arranged as follows:

- (a) Questions relating to personal and biographical details, i.e. types of ward, grade of the nurse, gender and years of experience in nursing.
- (b) Seven items rated on a 5-point scale concerned the frequency of omissions that are made in the assessment of patients with chest pain.

(c) Ten items rated on a 5-point scale concerned the causes of omissions. These ten items were selected from the information obtained following individual interviews with ten trained nurses working on the medical wards. All grades of staff from D to G were represented in this small sample. A modified Delphi Technique was used. A delphi technique is used to measure the judgements of a group of experts who do not have to meet together, the aim being to prevent the opinions of individuals to be altered by a few people at a meeting (Burns and Grove, 1993). Using this technique, each nurse was asked to make a list of the causes omissions that commonly occurred in the assessment of patients with chest pain. After completing the list, the nurse was asked to rank the omissions according to their frequency of occurrence. The lists from the ten nurses were then collated and the results were summarised into the ten most common causes of omissions. This revised list was then taken to each of the ten nurses, asking them how far they agree or disagree with the list of causes of omission. There were a high degree of consensus amongst the ten nurses. The most common causes of omission reported by the nurses in that exercise were lack of time, more than one nurse being involved in the assessment, poor documentation, work overload, unfamiliarity with acute cardiac disorders, stressful atmosphere, patient being transferred from another ward and lack of checking. This list corresponded closely with the categories of error-producing conditions (i.e. high workload; inadequate knowledge, ability or experience; poor interface design; inadequate supervision; stressful atmosphere; mental state; change) suggested by Reason (1995).

(e) The nurse then had to give an example from her/his personal experience of the commonest cause of omission which occurred in the assessment of patients with chest pain. This was to ascertain whether the nurse would be inclined to attribute the cause of an omission to a personal (internal) factor or to an environmental (external) factor. For instance, if the nurse blames lack of knowledge or ability as the cause of the omission, this will be considered as an



internal factor whereas blaming others or poor working conditions will be an example of an external factor.

(f) The nurse was asked to evaluate the cause of omission reported in (e) using the causal dimensions scale developed by Russell (1982) in order to ascertain the level of internality/externality in the nurse's response on the attributional dimensions of locus, stability and controllability. The instrument contains a set of nine semantic differential rating sub-scales. The cause is rated according to whether it (1) reflects an aspect of the situation (2) is controllable by you or others (3) is permanent or temporary (4) is intended by you or others (5) is inside or outside of you (6) is variable or stable over time (7) is something about you or others (8) is changeable or unchangeable and (9) is something for which someone is responsible or is not responsible. Each item is rated on a nine point scale. These nine causal dimensions scale yield three subscales, namely locus of causation (items 1, 5 and 7), stability (items 3, 6 and 8) and controllability (items 2, 4 and 9). The subscales are derived by averaging responses to the three items in the inventory that correspond to each of the sub scale . High scores reflect high levels of internality, stability and controllability. The maximum score for each sub scale is 27 and the minimum is 3.

(g) Finally, the nurse had to rate the level of usefulness of the documentation that was currently used for the assessment of patient with chest pain on a 5-point scale.

The questionnaire is found in appendix 3. Some sections of the self-report questionnaire will be reported in chapter 9.

### 8.3 Results.

#### 8.3.1 Responses from the self-report questionnaire.

All 88 nurses surveyed responded by filling in the questionnaire as instructed, giving a response rate of 100 %.

#### 8.3.2 Perceptions of nurses with regards to frequency of omissions in the assessment of patients with chest pain.

Six criteria relating to cardiac pain, ECG interpretation, observations for potential complications associated with chest pain and lifestyle were selected on the basis of their clinical importance to evaluate the frequency of omissions in their assessment. Nurses reported that they collected information on the history of the chest pain, intensity of the pain and the association of pain with other symptoms in over 90 % of cases. ECG results were reported to be recorded in virtually all cases. Assessment of shock was reportedly <sup>to be</sup> carried out in 79.5 % of cases, with 15 % of nurses being unsure whether it was assessed and 6 % reported that it was not always assessed. Information about smoking was always taken in 55 % of cases and not taken in 13 % of cases, with 32 % being unsure. Assessment of dietary pattern was carried out in only 47 % of cases and omitted in 23 % of patients, with 27 % being unsure. The results indicated that nurses were more likely to collect information pertaining to the chest pain and associated observations than to lifestyles.

These nurses' reported perceptions of omissions were then compared with the data on six common omissions reported in the study in chapter 7. This showed a wide discrepancy. This is shown in table 8.1.

**Table 8.1. Comparison of reported omissions and omissions in the assessment records (in percentage) in six selected criteria.**

Criteria	Perceived omissions (data from this study) %	Omissions assessment records (data from study in chapter 7) %	Z Statistic
History of chest pain.	4	6.7	-.45
Intensity of chest pain	1	43.3	-6.1***
Association of pain with other symptoms/signs.	0	66.7	-8.2***
Assessment of haemodynamic effects.	5.7	100	-9.5***
Dietary habits	25	36.7	-1.9
Smoking pattern	12.5	73.3	-6.2***
Record of ECG results	0	0	.000

\*\*\* P < 0.001

As the results in table 8.1 show, what nurses say they do and what may occur in practice may be two different things. Mann-Whitney U test was used to test the significance of the difference between perceived omissions and omissions observed in the assessment records of patients with chest pain. The results show that the difference in assessment of the intensity of the chest pain, associated signs/symptoms, haemodynamic disturbances, and assessment of smoking pattern was highly significant (P < 0.001). The only three areas of assessment where there was almost total agreement between reported and recorded assessment was assessment of the history of pain, ECG recording and assessment of dietary habits.

N.B. Since the data were collected from two different populations (and have different distributions), Mann-Whitney test was considered as more appropriate than, for example, the chi-square test ( as Mann-Whitney test is less dependent on population distribution and parameters than other statistics). Also, the data do not satisfy the restrictions of chi-square test that none of the cells should contain less than 5. when only two categories (or one degree of freedom) are used . The Mann-Whitney test determines the number of times a score of one of the samples is ranked higher than a score from another sample. If the two scores are similar, then the number of times this happen should also be similar for the two groups.

### **8.3.3 Perceived causes of omissions in the assessment of patients with chest pain.**

The causes of omissions in the assessment of patients with chest pain which nurses had to rate on a 5-point scale anchored by fully agree to fully disagree (from a list of ten scales provided in the questionnaire) varied. On average, nurses fully agreed/agreed with a minimum of 3 causes of omissions in the list (i.e. they perceived omissions to be due to multiple causes). In the majority of cases (56 %), nurses fully agreed/agreed that omissions in assessment occurred because the patient was too ill (patient's condition) to provide the necessary information for a proper assessment. The other commonly reported causes (fully agreed/agreed) were work overload (51 %), poor assessment documentation (46 %), lack of time (43%) and stressful ward atmosphere (43%). The results are shown in table 8.2.

In response to a separate question on how helpful they found the current documentation they were using, 69.3 % (N=71) of the nurses reported that the documentation was unhelpful, the remainder (29.7 %) found it either helpful or very helpful.

**Table 8.2. Rating of perceived causes of omissions in the assessment of patients with chest pain from a list of seven scales.**

Perceived causes	Number (fully agree/agree)	Percentage (fully agree/agree)
<b>Internal causes.</b>		
1. Lack of checking	22	22
2. Lack of familiarity	31	35
3. Not realising that the assessment was incomplete.	36	41
<b>Total number of responses</b>	<b>89</b>	
<b>External factors</b>		
4. Lack of time	38	43
5. Patients' condition (Patient too ill to participate in assessment)	49	56
6. Different nurses involved in assessment	34	39
7. Patient transferred from another ward	32	36
8. Work overload	45	51
9. Poor assessment documentation	40	46
10. Stressful atmosphere	38	43
<b>Total number of responses</b>	<b>276</b>	

As table 8.2 shows, nurses tended to fully agree/agree more to the occurrence of external causes of omissions (276 responses) than to internal ones (89 responses). To investigate this tendency further, nurses were asked to write down what they personally perceived to be the most common cause of omissions when nursing patients with chest pain. This is described below.

#### **8.3.4 Internal and external causes of omissions.**

From the nurses' responses regarding their perception of the most common causes of omissions in the assessment of patients with chest pain, nine categories of

causes of omissions were identified. The 'internal' category was used for all instances where the nurses blame an aspect of themselves or accept their own role in the omissions. The three most frequently reported internal factors perceived to be responsible for omissions were poor assessment skill, lack of knowledge, experience or training and unfamiliarity in nursing patients with chest pain. The 'external' category were applied to those factors which were external (or environmental) in origin. Five main external factors were frequently mentioned by the nurses. All nine categories of causes of reported omission are shown in table 8.3.

**Table 8.3. Classification of reported causes of omissions into internal and external categories.**

Perceived causes	Number	Percentage
<b>Internal (personal) factors.</b>		
1. Poor assessment skills	4	4.5
2. Lack of knowledge/experience/skill	7	8
3. Lack of familiarity in nursing patients with chest pain.	5	5.7
<b>Sub-total</b>	<b>16</b>	<b>18.2</b>
<b>External (environmental) factors.</b>		
4. Lack of time/work overload	21	23.9
5. Poor documentation/communication failures	12	13.6
6. Stressful/demanding ward atmosphere	3	3.4
7. Patient transferred from another ward	6	6.8
8. Too many nurses involved in the assessment	30	34.1
<b>Sub-total</b>	<b>72</b>	<b>81.8</b>
<b>Grand Total</b>	<b>88</b>	<b>100</b>

As shown in table 8.3, nurses tended to attribute causes of omissions in assessment of patients with chest pain overwhelmingly to external factors (i.e. causes 4 to 8). Only 18 % (N= 16) of reported causes of omissions (i.e. causes 1-3) could be described as being related to internal factors. The most common causes of omission were perceived to be too many nurses involved in the assessment of patients (34.1 %), followed closely by lack of time/work overload (23.9 %). Since these two causes of omission were also frequently rated in the list as being relevant (see table 8.2), they could be considered as crucial factors in the causation of omissions as well as particular areas of concern for the nurses. The least reported cause of omission was stressful ward atmosphere (3.4 %).

Although there were some similarities in the internal/external dimensions between the causes of omissions rated as "fully agreed/agreed" by nurses as from the 10 scales (table 8.2) and the causes of omissions identified by the nurses (table 8.3) as being most important from their own personal experience, there were also some differences in the types of external or internal factors that were reported to be responsible for the omissions in the two conditions. For instance, patient's condition was not personally identified at all by nurses as an important cause of omission whereas it was rated as common from the list of scales provided. However, this is not necessarily inconsistent as nurses could all perceived patients' conditions as important, but also secondary to other factors. Stress was identified as a perceived cause of omission by only 3 nurses whereas it was rated 38 times as being common in the list of scales.

### **8.3.5 Causal attributions for the reported omissions in assessment.**

Thus, the causes of omissions that nurses reported to occur in the assessment of patients with chest pain were classified as either internal (N= 16) or external (N= 72), according to whether the nurses blame themselves or aspects of the environment for the omissions as in table 8.4 . To find out whether or not the

classification of the attributional responses into internal and external dimensions stands up, causal dimensions scores were computed for each of the three subscales: locus of causality, stability and controllability. This was to compare the responses of those who had given an internal cause for the omission (N= 16) with those who had attributed the cause of their omission to an external cause (N= 72). This is shown in table 8.4.



**Table 8.4. Mean score and T-value of the three subscales of the causal dimensions in relation to reported internal and external causes of omissions.**

Causal dimensions	Internal (N.16)	External (N. 72)	T-value	DF
	Mean score (SD) (out of a total of 27) @	Mean score (SD) (out of a total of 27) @		
Locus	18.1 (5.6)	9.7 (4.7)	6.2 **	86
Stability	15.7 (4.8)	9.7 (4.2)	5.1 **	86
Controllability	19.4 (4.6)	13.2 (5.6)	4.1 **	86

@ Low scores indicate externality and high scores internality for locus; low scores indicate stability and high scores instability; and low scores indicate lack of control and high scores being in full control.

\*\* p < .0001

In table 8.4, it can be seen that there are statistically significant differences in the responses of the two groups on the dimensions of causality, stability and controllability, indicated by the higher scores that the "internal" group achieved in all three dimensions compared with the "external" group. According to Russell (1982), a causal response is classified as "internal" if the scores achieved on locus, stability and controllability are high (i.e. above the mid-way point). Conversely, "externals" would achieve lower scores on locus, stability and controllability. This confirms that the classification into external and internal causal responses was correct.

## **8.4 Discussion.**

The study explored the perceived causes of omissions in the assessment of patients with chest pain so that recommendations could be made about how to effect improvement.

### **8.4.1 Reported omissions and omissions found in the assessment records.**

Nurses in this study did not find omissions to be a serious problem in the assessment of patients with chest pain which suggests a misperception of risk. Their reported claims that hardly any omissions occurred in the assessment of patients are contrary to the findings of the audit of assessment records of patients with chest pain which found evidence of superficial assessment and the omissions of important details required for proper identification of patient's problems and planning of care. Argyris and Schon (1974) argue that there may be a difference between what a person says he would do when questioned with what he or she would actually do when faced with the situation. In fact, they differentiate between "spoused theory" (i.e. the theory of action to which an individual gives allegiance) and "theory-in-use" (i.e. the theory that actually governs an individual's action). According to Argyris and Schon (1974), these two theories may not necessarily be compatible with each other, and the individual may well not be aware of this incompatibility. Thus, as the nurses were not aware that there was anything amiss with their assessment and care of patients with chest pain, there was a potential danger that innocuous faults may accumulate within the 'system', which would then render the system unsafe. Alternatively, this could suggest that the system was already unsafe. Unusual circumstances such as staff shortage and lack of appropriately experienced nurses on duty may then trigger more serious errors and adverse events (Reason, 1990). Moreover, the nurses may not see the need to make changes in their practice because, as far as they were concerned, everything was running well. This could promote a norm

whereby nurses may pay little attention to quality and safety issues in their practice or aim to achieve excellence in their care.

However, it is also possible that the nurses may have assessed the patients as comprehensively as they reported, identifying and dealing with the problems correctly without seeing the need or having the time to document the assessment details in the patients' records. "Expert" nurses may be particularly liable not to record the results of their deliberation because of the intuitive approach to their work (Benner, 1984). The flaw in this practice is that whilst these nurses may be able to assess patients and identify priorities in care quickly, their reluctance to record these deliberations may fail to benefit the "novices" or nurses who were unfamiliar with nursing patients with chest pain, resulting in less than adequate care being given to patients. This may even have jeopardised the patients' safety because if the nurses had not been alerted of the presence of an actual problem or the likelihood of a potential problem arising, they might not be in a position to take urgent and decisive actions in response to the patient's changing clinical condition. Neale (1995) made a similar observation with regards to physicians decision-making. He argues that "clinicians repeatedly make 'on line' decisions regarding medical problems which occur unexpectedly. Often it is difficult to ensure the nature and effect of such decisions are clearly understood by all staff involved in the clinical care of the patient". Because of the skill-mix on the wards and the shift pattern, different nurses may be involved in the care of the patients. This may lead to serious variations in the care that the patients receive during their stay in hospital in the absence of a comprehensive assessment record and clear care plan. In fact, different nurses being involved in the care of the patients is identified as an important cause of omissions in patients' assessment in this study.

#### **8.4.2 Causal attributions of omissions.**

Nurses attributed the causes of the reported omissions overwhelmingly to external, unstable and uncontrollable factors which might suggest a degree of helplessness regarding their ability to assess patients as comprehensively as they might have liked. In fact, the majority of nurses in this study attributed the causes of reported omissions to uncontrollable factors such as work overload, stressful atmosphere, lack of time and too many nurses involved in the assessment of patients. Very few nurses made internal causal attributions such as lack of knowledge or skills in relation to the omissions. Bardwell (1986) argues that a nurse is less likely to change her or his behaviour if she or he predominantly blames external factors for the negative event.

#### **8.4.3 Clinical implications.**

Making external attributions for inadequate assessment of patients have other implications. It has been found in chapter 6 that when nurses accepted responsibility for their reported errors, they were more likely to make constructive changes in their practice. From the findings of this study, it would thus appear that nurses may not view omissions and other inadequacies in the assessment of patients in the same light as errors. In fact, it has been found that people tend to ignore "near-misses", not expending any effort in analysing the causal factors involved (Dejoy and Kippel, 1984). This apparent tendency to attach less importance to inadequacies in assessment and care may not only militate against constructive changes in practice to improve the quality of care but also may inadvertently create what Reason (1995) defines as 'error-producing conditions' or "latent" factors, which would then make more serious errors more likely to occur.

There are also some indications in this study that nurses may not be entirely happy with the documentation they were using in the assessment of their patients.

This might be an area where some changes could be targeted to reduce the level of omissions in the assessment and care of patients. For instance, Wallace et al (1994) state that the development and use of proformas in medical practice for specific conditions have resulted in more accurate and complete medical records which is an essential component of quality care. Introducing documentation which incorporates clinical nursing guidelines would make the knowledge needed to assess and care for patients with a specific condition readily and immediately available for all nurses to use and would also provide some form of "prompts" for nurses to remind them of the types assessment and care that are needed at any given point during the patient's stay in hospital.

#### **8.4.4 Limitations of the study.**

Since the evidence of omissions and inadequacies in the assessment of patients were obtained from the nursing records, there was no external confirmation that the actual assessment of these patients was necessarily unsatisfactory. More accurate and generalisable results could have been obtained by direct observation of the nurses during the assessment of specific patients with chest pain. It was also possible that the nurses may have intentionally omitted to collect certain data because they did not feel it was required for these patients. Direct interview of the nurses following the assessment could have clarified these issues. Moreover, the small sample of assessment records audited compared to the larger number of nurses invited to complete the self-report questionnaire on general omissions in the assessment of patients with chest pain may have made the results rather skewed and limit their generalisability. Finally, with "real" incidents of omissions and other forms of inadequacies in the clinical situation, nurses may possibly use different types of causal attributions to those found in this study.

Nevertheless, unrecorded information can be very dangerous. It could have an impact on the quality of care that patients receive. There is a particular risk

involved if the patient is looked after by a staff who are not familiar with the patient's condition and treatment or is inexperienced. As a result important aspects of care may be omitted. There is also a medico-legal dimension regarding poor nursing records. In a court of law, it will only be accepted that a particular care has been given if it has been recorded in the nursing notes.

#### **8.4.5 Conclusions.**

The findings of this study provide some relevant insights into possible inadequacies in a very important area of nursing. These inadequacies have also been highlighted in other reports and studies (e.g. Health Service Commission, 1987; Audit Commission, 1993; Hale et al. 1997). Some strategies to reduce these inadequacies using an attributional approach will be investigated in chapter 11. For instance, there are some indications in this study that the nurses may use external causal attributions in response to omissions and inadequacies in the assessment of patients. This would suggest that a system approach to deal with these inadequacies may be effective.

In this chapter, it has also been shown that there may be a misperception of risk by the nurses. Their perception of the frequency of omissions in the assessment patients did not match those observed in the patients' records. It is also possible that their perception that lack of knowledge was not an important factor in causing omissions in the assessment of patients may be inaccurate.

The next chapter examines the level of clinical knowledge nurses possess in relation to the assessment of patients with chest pain, particularly comparing knowledge they can recall and knowledge they can recognise as relevant.

## **CHAPTER NINE: NURSES' CLINICAL KNOWLEDGE RELATING TO THE ASSESSMENT OF PATIENTS WITH CHEST PAIN.**

### **9.1 Introduction.**

In chapter 7, it was found that the assessment of patients diagnosed with chest pain was superficial and contained a number of omissions. It was argued that incomplete or inadequate assessment of patients, when combined with unusual local circumstances, may lead to errors and adverse events. Thus, to improve the quality and safety of care of patients with chest pain, it is important to ascertain what factors may contribute to inadequate assessment of these patients. Reason (1990) points out that many factors may contribute to errors and other systems failure, including lack of knowledge and experience. Similarly, the findings in chapter 6 revealed that nurses perceived lack of knowledge to be an important causative agent for their error. However, with regards to omissions in the assessment of patients with chest pain, the majority of nurses reported that external factors (e.g. work overload, too many nurses being responsible for assessment of patients) were responsible as opposed to internal factors such as lack of knowledge or experience. However, there is evidence that lack of knowledge may play an important part in quality of care. For instance, Puntis et al (1990) found that after nurses and doctors had followed an education programme and gain knowledge and skills on correct hand-washing technique, the incidence of sepsis in intravenous catheters was able to be reduced from 45 % to 8 %, demonstrating that clinical knowledge and skills have an impact on competent professional practice.

Thus, the role of knowledge and expertise in providing quality care and reducing variances in clinical practice is generally well recognised in professional practice. For instance, the UKCC replaced the certificate course in nursing by an all diploma (i.e. p2000) course ostensibly to develop "knowledgeable-doers", the

assumption being those nurses will be better equipped to cope with the increasingly complex nature of health care. This assumption is further advanced by the implementation of the Post Registration Education and Practice (PREP) proposal for nurses, requiring trained nurses to regularly keep themselves up to date (UKCC, 1994) for periodic recertification every three years.

### **9.1.1. The retrieval of knowledge from memory.**

During the assessment of a patient, the nurse has to make critical decisions about the relevance of various data before arriving at a diagnosis of the patient's problems and selecting the type of interventions that are required. Knowing what data to collect and how to interpret them will depend on the possession as well as the appropriate use of an array of mental models or "schemata" (Reason, 1990). Nurses will need to use various retrieval cues during the assessment of the patient to allow the relevant knowledge to be activated from their memory and to bear on their decision-making process (Reason, 1990). Salem-Schatz et al (1990) also argue that both clinical "facts" and experience are important in the clinical assessment and care of patients. Thus, the ability to remember key information is fundamental if assessment and care of the patients were to be carried out correctly. There are two main ways in which relevant information can be retrieved from memory: recall and recognition.

Recall is the ability to retrieve and reproduce from memory previously encountered material whereas recognition is the ability to identify previously encountered material. With recall, a person has to tap from memory information that is not currently present. In contrast, recognition only requires the matching of a current stimulus with what has been stored in memory. Wade and Travis (1990) argue that under most circumstances recall is more difficult than recognition. Bahrick et al. (1974) found that when recent graduates were asked to write down the names of as many classmates as they could remember, they could write only a



few dozen names. On the other hand, when the graduates were shown cards containing some of their former classmates in them, they were able to remember their names in 90 % of cases. This demonstrates that recall tests may underestimate the amount of information people retain in their memory.

Reason (1990) postulates that the working memory "plays a crucial part in controlling the current 'working database', regardless of whether the information contain therein has arrived by way of senses or whether it has been called up from long term memory in the course of reasoning, thinking or performing...". However, because of the limitations of the working memory, various factors may impede its effective functioning. Norman (1984) has suggested that tasks should be simplified to reduce the load on the working memory. For instance, the standardisation of procedures may help to reduce error by promoting the use of pattern recognition which is known to help retrieval of information and lighten the load on human cognition (Leape, 1994). Similarly, Atkinson et al (1990) suggest that people who are given retrieval cues recall more words than people who are not given such clues. This explains why people do better on recognition tests than on recall tests, the test item itself in the recognition test being an excellent retrieval cue for our memory for that item.

The concept of 'working memory' is important in the understanding of how omissions might occur in nursing care. Nurses have to undergo long statutory training and clinical experience to gain the knowledge and clinical skills underpinning their practice. They not only have to accumulate various clinical facts, but also need to be able to retrieve them from their memory at the appropriate time. However, as it has been discussed earlier, recall is not easy in situations of stress and work overload; and in chapter 6, it was also reported that slips and lapses are the most common perceived types of errors in nursing and work overload and stressful atmosphere were reported as common causes of these

errors. In the case of patients with chest pain, various items of clinical knowledge are required to assess the patients correctly and identify the actual and potential problems. However, the patients with chest pain are usually admitted in a critical state, requiring rapid intervention and/or accurate monitoring of the physical signs. In this kind of cognitively demanding situation, the nurse may not be able to recall key aspects of knowledge which would help her/him to make specific observations and understand causal clinical relationships, despite the fact that they may have learnt them before. As a result, subtle signs of complications may not be picked up. Although nurses use some types of retrieval cues such the Activities of Living Model of Nursing (see appendix 1), these may not be specific enough to enable them to recall key knowledge regarding conditions such as angina/myocardial infarction. But, findings from research on memory suggest that more specific retrieval cues such the use of clinical guidelines may help nurses remember appropriate knowledge and their application to specific clinical problems.

This study has the following aims:-

- 1) To evaluate the nurses' level of knowledge relating to the assessment of patients with chest pain.
- 2) To determine whether there is a difference between recall and recognition in the retrieval of knowledge relating to the assessment of patients with chest pain from memory.

## **9.2 Method.**

### **9.2.1 Design.**

As part of a larger study reported in chapter 8, the knowledge level of 88 qualified nurses relating to the assessment of patients with chest pain was tested. The sample selected for the study came from 4 medical wards of one General Hospital Trust. The nursing staff were from grade D to G, with 39.8 % (N=35) in

grade D, 38.6 % (N=34) in grade E , 15.9 % (N=14) in grade F and 5.7 % (N=5) in grade G. This is broadly representative of the distribution of grades of staff on medical wards used for this study. The nurses had between one and 25 years experience between them (mean 9.7 years ).

### **9.2.2 Procedures.**

The questionnaire used in this study was piloted with a group of 12 nurses, consisting of one grade G, one grade F, four grade E's and six grade D's. The nurses were also invited to write down their comments about the content of the questionnaire. All 12 nurses reported that the two sections relating to knowledge assessed what it purported to measure, i.e. their knowledge of the assessment of patients with chest pain arising from angina and myocardial infarction. This indicated that the questionnaire had content validity. However, most of the nurses in the pilot survey suggested that the question relating to recall should be amended to specify that the participants should list as many items of information as they can remember as opposed to just list the information. This was the only change made to the sections on knowledge in the questionnaire before it was used in the study proper.

For the main study, staff working on both day and night duty were approached individually by the author and were invited to participate in this study. After a brief introduction of the aims of this study, the participants were given the questionnaire to complete. They were assured of anonymity and confidentiality and were also given the option to opt out if they did not wish to participate. All of them offered to participate. The questionnaires were collected from the participants within the same day or night of distribution.

### **9.2.3 The questionnaire.**

The questionnaire consisted of 51 items, but only the following sections will be reported in this study as the rest has already been reported in the study in chapter 8.

- 1) A section concerning personal/biographical details (i.e. sex, grade, years of experience and type of ward where the nurse is currently employed).
- 2) Two sections on measures of clinical knowledge relating to the assessment of patients with chest pain.

#### **a) Recall knowledge.**

This is tested by asking the nurse to write down as many items of information as she/he can remember regarding the assessment of patients with chest pain. Each relevant item of information written down is given a score of 1, up to a maximum score of 15. This is then described as the total recall knowledge score. The core items of information deemed as relevant answers in this test were derived from the criteria already developed by the researcher in a pilot study and literature review (the literature review is discussed fully in the introduction of chapter 7), and included information relating to the history, type, location and intensity of chest pain, associated haemodynamic disturbances, assessment of vital signs, arrhythmias, ECG, associated nausea/vomiting, previous medical history and patients' lifestyle

#### **b) Recognition knowledge.**

In the second step of knowledge assessment, towards the end of the questionnaire, the 15 criteria for chest pain assessment were included with 5-point Likert response scales anchored by "not relevant" and "very relevant". Responses to these criteria were transformed so that the correct response (i.e. a tick in the relevant or very relevant section) yielded a score of 1, again giving a possible maximum score of 15. This is called the total recognition knowledge

score. The criteria was description of chest pain, past medical history, current medication, history of chest pain, relationship of pain to activity, association of chest pain to other symptoms, shock, oedema, breathlessness, ECG, BP, Pulse rate, smoking pattern, drinking pattern and dietary habits.

3) One question asked the nurse to write down what she/he perceived to be the commonest cause of omissions in the assessment of patients with chest pain. The nurse's response was classified as either internal (i.e. when personal causes such as lack of knowledge or experience was given) or external (i.e. when an external cause such as work overload or lack of time was given).

3) One item rated on a 5-point scale concerned health teaching of cardiac patients by the nurses.

#### **9.2.4. Validity and reliability.**

The 12 nurses who participated in the pilot survey were invited to write down comments as well as discussing these comments with the researcher regarding the validity of the questionnaire, i.e. whether it was measuring what it purported to measure. All twelve nurses felt the questionnaire had content validity, i.e. they felt it was effective in testing them about their knowledge of angina/myocardial infarction.

The internal consistency reliability coefficients (Cronbach's alpha) for the recognition knowledge test scale was 0.86. This indicates that the internal consistency was good and that the different items in the scale were measuring the same concept (i.e. chest pain) very well. Correlations between single items and total ranged from 0.32 to 0.65 (13 of the 14 items in the recognition test scale exceeded 0.4). Internal consistency is deemed to be adequate where Cronbach's alpha is greater than 0.7 and correlations between items and total exceed 0.4 (Streiner and Norman, 1989).

### **9.3 Results.**

All the 88 nurses approached completed the questionnaire as instructed, giving a response rate of 100 %.

#### **9.3.1 Nurses' recall of knowledge relating to chest pain.**

The results, as displayed in table 9.1, showed that nurses' recall of knowledge relating to chest pain was relatively poor, with an overall recall rate of less than 50 % of the target knowledge. Items relating to the cardiac pain itself were recalled quite well. For example, description of chest pain was recalled in 90 % of cases, history of chest pain in 70 % of cases. However, items relating to the assessment of physiological effects of the condition and potential complications were poorly recalled, with only BP and pulse assessment being recalled in over 70 % of cases whereas assessment of potential complications such as shock and pulmonary complications were recalled less well. The nurses obtained the lowest scores on recall of items relating to aspects of lifestyle which could influence the condition.

#### **9.3.2. Nurses' recognition of knowledge relating to chest pain.**

On 'recognition' knowledge, nurses obtained significantly better scores, achieving an overall recognition rate of over 84 % of the target knowledge. The nurses recognised all of the items of knowledge relating to the history of pain in over 83 % of cases, the seven items relating to physiological/physical observations were recognised in over 70 % of cases, and the items relating to lifestyle in over 60 % of cases. The results are shown in table 9.1.

**Table 9.1. Comparison of scores derived from recall and recognition tests.**

<b>Criteria</b>	<b>Recall Scores (%)</b>	<b>Recognition Scores (%)</b>
<b>History of development of chest pain</b>		
Description of pain	80 (90.9)	87 (98.9)
Past medical history	47 (53.4)	83 (94.3)
Current medication	33 (37.5)	83 (94.3)
History of chest pain	62 (70.5)	88 (100)
Relationship of pain to activity	28 (31.8)	86 (97.7)
<b>Physiological and physical observations</b>		
Association of pain with other symptoms	24 (27.3)	83 (94.3)
Shock	53 (60.2)	78 (88.7)
Oedema	5 (5.7)	67 (76.1)
Breathing assessment	43 (48.9)	83 (94.3)
ECG	38 (43.2)	84 (95.7)
BP (Hypotension/hypertension)	70 (79.5)	73 (94.3)
Pulse rhythm	65 (73.9)	85 (96.5)
<b>Life style.</b>		
Smoking pattern	10 (11.4)	60 (68.2)
Dietary pattern	7 (8.0)	56 (63.6)
Alcohol intake	3 (3.4)	54 (61.3)

### 9.3.3. Comparison of recall and recognition.

Related t-tests, as displayed in table 9.2, showed that there was significant differences between the knowledge scores obtained in recall and recognition tests. The results suggested that although nurses may not recall all the information relating to the assessment of patients with chest pain, they did

recognise the relevant knowledge when this was presented to them in the form of a scale. There was no significant association between grade and knowledge scores in the recall and recognition tests. Years of experience in nursing was also found not to be significantly related to recall and recognition scores

**Table 9.2. Difference between mean scores obtained in the recall and recognition tests.**

Areas of tests (range of scores)	Pairs	Mean (SD)	SE of mean	Df	T-value
<b>Development of pain (0-5).</b>					
Recall	88	2.82 (1.2)	.128	1, 87	-15.47***
Recognition		4.86 (.43)	.046		
<b>Physical/physiological observations (0-7)</b>					
Recall	88	3.40 (1.6)	.174	1, 87	-15.69***
Recognition		6.45 (.09)	.094		
<b>Lifestyle (0-3)</b>					
Recall	88	.238 (2.1)	.227	1, 87	-23.04***
recognition		1.94 (2.0)	.214		
<b>Overall score (0-16).</b>					
Recall	88	6.8	.246	1, 87	22.33***
Recognition		13.5	.209		

\*\*\* P < 0.001

The nurses showed varying degree of deficiencies in specific knowledge in the three sub-areas of assessment (i.e. history of development of chest pain, physiological/physical observations and lifestyle) of patients with chest pain. Nurses obtained considerably higher scores in the recognition test than in the



recall test not only on the individual criterion, but also in all the three sub-areas of assessment. This is discussed in the following sections:

#### **9.3.3.1 History of the development of chest pain.**

Scores obtained on the recall test indicated that nurses' knowledge of the assessment criteria of the cardiac pain itself was quite good, particularly description of pain (90.9 %) and history of pain (70.5 %). However, they achieved a score of under 50 % in the other three criteria (i.e. medical history, current medication and relationship of pain to activity). By contrast, in the recognition test, nurses achieved over 80 % in all 5 criteria relating to the history of the development of pain. The difference between the two mean scores were found to be highly significant.

#### **9.3.3.2 Physiological/physical observations.**

In the recall test, nurses did poorly in 4 of the 7 criteria in this subscale. They did relatively well on assessment of signs of shock (60.2 %), evaluation of blood pressure (79.5 %) and evaluation of pulse rate (73.9 %). The scores obtained in the recognition test were over 65 % in all seven criteria. As shown in table 9.3., the difference between the mean scores of the recall and recognition tests was found to be statistically significant.

#### **9.3.3.3 Lifestyle.**

The lifestyle criteria of smoking, dietary habits and drinking were mentioned by less than 11 % of the nurses in the recall test. The nurses did better in the recognition test, achieving over 54 % in all three criteria. The difference between the two scores in this subscale was statistically significant. However, as table 9.1. shows, scores on lifestyle's criteria were proportionally lower than scores achieved in the criteria in the two other sub-scales in both recall and recognition tests.

#### **9.4 Discussion.**

The purpose of this study was to assess whether there was a difference between nurses ability to recall and to recognise core criteria relating the assessment of patients with chest pain and to suggest ways in which improvement in assessment of patients might be effected. Overall, nurses have poor recall of the core criteria relating to the assessment of patients with chest pain. Yet, their recognition of the relevance of these criteria was excellent. The variability in the nurses ability to recall relevant knowledge may be a possible contributing factor in the superficial assessment of patients with chest pain reported in chapter 7, although other factors may also play an important part as will be discussed later.

##### **9.4.1 Level of clinical knowledge relating to assessment of patients with chest pain.**

This study shows that the level of nurses' knowledge of assessment and management of chest pain may be quite variable in acute medical wards. Nurses did particularly poorly on the recall test with only a very limited number of them being able to recall more than 7 out of the fifteen criteria. However, most of the nurses in the recognition test see the relevance of the 15 criteria in the assessment of patients with chest pain when these were presented to them, which may indicate that the items in the recognition test may act as retrieval clues enabling nurses to retrieve previously learned knowledge from their memory more effectively. It is also possible that when nurses are actually assessing patients, they may have a better recall than reflected in the recall score in this study as the patients' condition itself may provide retrieval clues. However, changes in the local conditions of work ( e.g. increased in workload and lack of experienced staff on duty) or undue load on cognition arising from stress, fatigue or sensory over-load may make it less easy for nurses to pick up these clues and may even trigger active failures.

While the nurses in the recall test were adequately knowledgeable in the assessment of the cardiac pain itself, they were less good at recalling the potential complications that could arise or the potential lifestyle risk that needed to be assessed. These deficiencies in their knowledge may affect the safety and quality of their care. For instance, potential signs of complications may be overlooked, hence delaying interventions which may prevent actual complications from occurring. However, the results also show that although the nurses may not remember certain key information relating to the assessment of patients with chest pain, they can recognise the relevant knowledge if they are shown a list. This raises a host of issues relating to the nature of knowledge and its use in the clinical situation.. Cook and Woods (1991) argue that when solving a problem, the relevant knowledge needs to be recalled and organised. Mistakes may arise if the individual has inadequate knowledge or if the knowledge is inert (i.e. when knowledge needed for use in a problem-solving context cannot be activated at the time).

Nurses did not appear to be aware that there were gaps in their knowledge and the impact this may have on their practice. In fact, only a small proportion of the nurses mentioned lack of knowledge as a cause of their omissions in the assessment of patients with chest pain, the majority of them reporting external factors to be the main source of omissions/inadequacies in assessment (this is more extensively discusses in chapter 8).

The findings also indicate that nurses may perceive knowledge relating to lifestyle as less relevant than knowledge related to the cardiac pain and physical/physiological complications. This may be because they saw dealing with the cardiac pain and resultant complications as being of higher priority in the immediate period of admission to hospital than in finding out about the patients' lifestyle. However, assessment of patients should be a continuous process and

should not concentrate just on admission. With regards to patients admitted with angina/myocardial infarction, it is vital to identify factors in their lifestyle which may have predisposed to their illness and may subsequently affect their rehabilitation.

#### **9.5. Limitations of the study.**

The findings have certain limitations. The assessment of nurses' "recalled" knowledge were not done under supervision or "exam" condition. Thus, nurses would have had the opportunity to discuss with their colleagues what to put down on the form. Conversely, some nurses may not have taken the exercise seriously enough and may have written less than what they actually knew about assessment of patients with chest pain. In a previous study involving doctors, it was also found that competence (e.g. at answering exam questions) on its own does not have predictive value on actual practice (Rethans et al, 1991). With regards to the assessment of knowledge by recognition, more reliable results could have been obtained if some "non-relevant" items were also introduced in the list, hence forcing the nurses to distinguish between relevant and non-relevant items.

#### **9.6. Possible role of clinical knowledge in care planning.**

The objective of assessment in the nursing process is to collect and analyse relevant information in order to identify the problem and plan an intervention. It can be tentatively suggested that if nurses do not have adequate clinical knowledge or cannot retrieve appropriate knowledge when it is required in clinical-decision making, then the quality of care that the patient receives may be less than adequate. For example, in this study, a sizeable number of nurses did not consider it their responsibility to teach cardiac patients about the need to reduce risk factors associated with heart disease. Most of these risk factors are related to smoking and dietary habits, which incidentally were poorly recalled in the recall test, and to a lesser extent, in the recognition test as well. The post-

myocardial rehabilitation of cardiac patients is heavily based on advising modification of unhealthy lifestyle, which requires data on the patients lifestyle habits.

### **9.7. Clinical implications of the study.**

The overall findings of this chapter have indicated that nurses may not be completely aware of the gaps in their knowledge relating to specific assessments of patients. With the introduction of the Post Registration education and Practice (PREP) proposal, nurses are now required to attend a minimum of five study days for re-certification every three years. Although such measures as well as other update courses may improve the knowledge of the staff, it is also important to appreciate that because of the skill-mix on a typical ward there will always be some variability in clinical knowledge. However, findings from this study indicate that although nurses may not recall the appropriate knowledge needed for the assessment of patients with chest pain, they do recognise what knowledge is relevant when they are given some appropriate prompts or clues. Thus, the introduction of care-pathways/clinical nursing guidelines for specific conditions may provide nurses of different experience and knowledge with the information required to work effectively and uniformly under different work demands. This may help to reduce variations in assessment and care, thus improving the quality of care delivered to the patients. As the different aspects of assessment and care of patients with chest pain and the periods of patients' stay that these should occur are specified in the care pathway, these would act as triggers to recognition and action.

Findings from this study also indicate that nurses tend to focus their assessment of patients with chest pain to the immediate needs of the patients on admission with little evidence of systematic assessment in the latter period of patient's stay

in hospital. Again, a care-pathway might help to resolve this problem as it would cater for the full episode of the patient's stay in hospital.

### **9.7.1. The development of an assessment proforma for angina/myocardial infarction.**

On the basis of information derived from the types of deficiencies of knowledge observed in nurses' recall test and the ease with which the nurses were able to identify relevant knowledge relating to the assessment of patients with chest pain from the recognition test scale, the researcher has developed an assessment proforma for chest pain as a further step in the development of the care pathway. The assessment proforma is structured in such way as to guide or prompt the nurses to collect specific items of information relating to chest pain and to carry out selective physical/physiological measurements, with designated spaces to record the assessment data. At the end of the assessment proforma, a space is also allocated to prompt nurses to synthesise the data they have collected on the patient and to list down the problems they have identified. This will then lead to the next stages of the nursing process, i.e. care-planning, implementation and evaluation. In the medical examination of patients, assessment proformas for specific conditions have been found to be very effective as well as efficient in guiding the physician to assess patients, particularly in accident and emergency departments (Wallace et al, 1994). Goodyear and Lloyd (1995) have also reported that the number of clinical details present in pre-printed assessment sheets were significantly higher than those recorded with traditional notes. It is likely that this may apply to the nursing assessment of patients as well. Therefore, it is intended to test the effectiveness of the assessment proforma in the assessment of patients with chest pain in conjunction with the full care pathway in an intervention study to be reported in chapter 11. The final version of the assessment proforma is found in the appendix 5.

### **9.8. Conclusions.**

The findings of this study indicate nurses' knowledge in relation to chest pain may not be adequate to enable them to carry out a comprehensive assessment of patients with chest pain or to understand the priorities in the care of these patients. Nurses also did not seem aware that there were gaps in their knowledge. This may introduce an element of risk in their care.

The study reported in the next chapter examines the perception and responses of nurses to 'actual' errors in patient care. Antecedents and effects of errors in nursing were reported in chapter 6. In chapters 7, 8 and 9, the circumstances (e.g. inadequate assessment of errors, external causal attribution of omissions in assessment and lack of clinical knowledge) that may promote errors were examined. To understand fully the mechanism of error production and the types of preventative measures that can be undertaken, it is important to gain insight into the chain of events (i.e. antecedents of errors/latent failures → local conditions → active failures) that lead to an adverse event. Thus the next chapter will investigate how nurses react to active failures (errors) which have led to a serious and non-serious outcome.

## **CHAPTER TEN: COMPARISON OF NURSES' RESPONSES TO ERRORS WITH A SERIOUS AND NON-SERIOUS OUTCOME: THE IMPLICATIONS FOR PRACTICE.**

### **10.1 Introduction.**

In the previous chapters, it was found that nurses attributed the causes of their errors and omissions in nursing care to more than one cause. The findings in chapters 6 and 8 also suggest that the perceived causes of errors and omissions in care tend to be of two kinds: internal (or personal) and external (or environmental). A number of studies (e.g. Kelley, 1972; Weiner, 1972) on attribution have shown that this internal/external categorisation of causes of events is critical for the responses that follow. For instance, when making an external causal attribution for a negative event such as an error, the subject is more likely to deny responsibility for it (De Jong et al, 1988). On the other hand, accepting responsibility for an error was found in chapter 6 to be an important prerequisite for learning and for making constructive changes in practice. Wu et al (1991) also found that those physicians who accepted responsibility for their mistakes were more likely to make constructive changes in their practice.

However, the findings in chapter 8 indicated that the majority of nurses perceived the causes of omissions and other inadequacies in the assessment of patients with chest pain to be external. It is possible that nurses may not interpret these omissions as errors and they may react differently to more "defined" errors which has resulted in a serious outcome. In fact, Dejoy (1990) argues that people tend to see themselves as less responsible for 'near-misses' than with an actual accident. As the types of causal attributions nurses make about aspects of safety and quality in nursing care may have implications for the types of changes that may be introduced and might be effective, it is important to understand the salient factors which influence nurses' causal reactions to different types of errors.



To improve quality and safety in nursing care, there is a need to gain insight into the chain of events that lead to an adverse event, encompassing the antecedents of errors, latent factors, the local conditions that would promote the production of errors, and actual occurrences of errors and adverse events. This would then enable the identification of root causes of errors and omissions in care, hence enabling proper targeting of preventative measures. So, it is important to look at errors per se whether or not they have a serious outcome.

The issue of safety is important for all clinical staff. For instance, Florence Nightingale's dictum "first do no harm" is enshrined in the nursing culture. In the same vein, nurses as well as doctors tend to react "pathologically" to errors, viewing an error as a failure of character (Leape, 1994). Most investigations of errors in clinical practice are also focused at incidents and individuals, and the root causes of errors are rarely sought. These kinds of reaction to errors may block changes aimed at reducing them and may fail to uncover errors which have not led to an adverse outcome. It is therefore crucial to investigate reaction to errors both to assist staff in coping with errors and to develop appropriate error reduction strategies.

The purpose of the study reported in this chapter was to investigate how nurses respond to errors (active failures) and whether they would make different types of causal attributions for an error with a serious outcome compared to one with a non-serious outcome. A second purpose of the study was to examine the types of causal factors that are associated with taking responsibility for an error.

## **10.2 Method.**

Sixty nurses were selected for this study. The staff were attending the day release "Examining and Assessing" course. The staff were seconded on this course from

three NHS trusts. Their grade ranged from D to G, and they had between one to twenty six years experience in nursing between them (mean 11.6 years).

### **10.2.1 Procedures.**

The staff were given a brief introduction about the aims of the study and the type of participation required. They were assured of anonymity and confidentiality and given the option of not participating if they so wished. None declined to participate. The questionnaires and an accompanying letter were then distributed and the nurses were given thirty minutes of course time to complete the questionnaires. Half of the sample (N= 30) received the scenario with a serious outcome and the other half the non-serious outcome.

### **10.2.2 The questionnaire.**

The nurses were presented with a scenario (see appendix 6). The scenario involved a man returning from theatre following a prostatectomy, with a written instruction that the urinary catheter be secured to prevent dislodgement. This was not carried out. In the non-serious outcome condition, no harm came to the patient but the error was noticed by the surgeon when visiting the patient. In the serious outcome condition, the catheter came off and the patient bled profusely.

After reading the description and visualising themselves to be personally involved in the scenario for about one minute, nurses had described what they perceived to be the most important cause of the error. The cause was coded as internal or external according to whether they blamed themselves (self-blame) for the error or others/environment (other-blame). They then evaluated the cause using the causal dimensions scale (Russell, 1982). The instrument contains a set of nine semantic differential rating subscales. The cause is rated according to whether it (1) reflects an aspect of the situation (2) is controllable or uncontrollable by you or others (3) is permanent or temporary (4) is intended by

you or others (5) is inside or outside of you (6) is variable or stable over time (7) is something about you or others (8) is changeable or unchangeable and (9) is something for which someone is responsible or is not responsible. Each item is rated on a nine-point scale. These nine causal dimensions scale yield three subscales, namely locus of causation (items 1, 5 and 7) stability (items 3, 6 and 8) and controllability (items 2, 4 and 9). The subscales are derived by averaging responses to the three items in the inventory that correspond to each of the subscale. High scores reflect high levels of internality, stability and controllability respectively. The maximum score for each sub-scale is 27 and the minimum score is 3.

Participants also rated their responses to the following three questions on a scale of 1 to 9, with 9 indicating the highest level of globality , importance and responsibility.

- (i) Is the cause you have mentioned typical of this situation or can it also affect other aspect of your work (globality dimension)?
- (ii) How important would this situation be if it actually happened to you ?
- (iii) Do you feel responsible for the error ?

Finally, the participants had to write down their present grade and the number of years in nursing. The questionnaire can be found in appendix 6.

### **10.3 Results.**

All sixty nurses completed the questionnaire. Eighty percent (N=26) of those responding to the scenario with the serious outcome and 63 % (N=19) responding to the scenario with the non-serious outcome would have blamed themselves if they had made this error. A chi-square test showed a significant difference between the two groups ( $p < .05$ ), indicating more self-blame amongst those who had visualised themselves to be involved in the serious error.

### 10.3.1 Causal Dimensions Scores.

Causal dimensions scores were computed for each of the three subscales for both serious and non-serious outcomes. A one-way ANOVA was used to determine whether the attribution scores in the three sub-scales differ significantly in the two groups. Table 10.1 contains the group means, the standard deviations, degrees of freedom, F value and significance level of the 3 subscales for the two conditions .

**Table 10.1 Comparison of the scores obtained by the groups in the serious and non-serious conditions on the three sub-scales of the causal dimension scale.**

<b>Causal dimensions</b>	<b>Serious outcome Mean (SD)</b>	<b>Non-serious outcome Mean (SD)</b>	<b>Df</b>	<b>F-value</b>
Locus	15.3 (5.4)	14.1 (5.4)	2, 58	1.06
Stability	8.6 (3.7)	8.6 (3.7)	2, 58	1.54
Controllability	17.8 (2.9)	15.1 (3.4)	2, 58	3.33***

\*\*\* p < .001

The maximum score that could be obtained for each subscale is 27 and the minimum is 3. Higher scores on the subscale indicate internality, stability and controllability. Lower scores indicate externality, instability, and uncontrollability. Nurses in both serious and non-serious conditions obtained scores higher than the mid-point of the scale on the locus of causality and controllability dimensions, indicating a tendency towards internality and controllability. In the serious outcome condition, nurses scored slightly higher in the locus of causality and controllability dimensions than nurses in the non-serious condition, although this reached significance only in the controllability

dimension ( $p < .001$ - see table 10.1). The stability scores for the two groups were similarly low (mean =8.6), suggesting both groups perceived the cause of the error to be unstable. Overall, both group of nurses tended to judge the cause of the error to be internal, unstable and controllable.

### **10.3.2 Implications of errors.**

Nurses in both the serious and non-serious conditions rated a high level of globality relating to the cause of the error (mean score 6), i.e., it could affect other aspects of their work and that it was not typical only of the present error. If the same cause remained present, other errors could be made. As expected nurses in the serious outcome condition attached more importance to the error ( $p < .0001$ ). Both groups considered that the error could affect their work generally. Nurses involved in the serious error were slightly more inclined to take responsibility ( $p < .01$ ). The results are shown in table 10.2.

**Table 10.2 Comparison of responses of the two groups (serious and non-serious conditions) on the globality dimension, perceived importance of error and acceptance of responsibility.**

<b>Variables</b>	<b>Serious outcome Mean (SD)</b>	<b>Non-serious outcome Mean (SD)</b>	<b>Df</b>	<b>F-value</b>
Cause of error can also affect other aspect of my work (globality)	6.1 (2.7)	6.4 (2.0)	2, 58	1.7
How important would this situation be if it actually happened to you	8.5 (0.7)	6.9 (1.8)	2, 58	6.4**
Do you feel responsible for the error	7.2 (1.7)	6.8 (2.7)	2, 58	2.59***

\* p < .05    \*\* p < .01    \*\*\* p < .0001

### 1 0.3.3. Factors associated with accepting responsibility for the error.

Pearson Product Moment Correlation was used to test the degree of association between locus of causality, stability, controllability, globality, perceived importance of error and accepting responsibility for the error. Table 10.3 provides data on the factors relating to accepting responsibility for the error.

**Table 10.3 Correlation of locus, stability, importance, grade with accepting responsibility for one's error in the serious and non-serious conditions.**

Factors	Accepting responsibility		
	Serious condition	Non-serious condition	Overall
Locus (internality)	.42 **	.36 *	.38 **
Stability	-.39 *	-.004	-.20
Controllability	.26	.09	.13
Globality	.12	.11	.12
Importance	-.01	.31 *	.08

p < .05    p < .01

In the non-serious condition, locus of causality and importance attached to the error were positively correlated to accepting responsibility for the error. In the serious condition, locus of causality was positively correlated to accepting responsibility for the error whereas stability was negatively correlated to accepting responsibility. There was no significant relationship between controllability and responsibility, although the two variables may be expected to measure the same thing (e.g. within the controllability dimension, one of the statements concerned feeling responsible for the error).

A hierarchical regression involving both groups (and using error severity as a variable to test the effects of the groups on the dependent variable) was used to determine which factors contributed the most to the assignment of personal responsibility for the error. Years of experience in nursing and importance attached to the error were entered at the first step. Severity of error (i.e. group) was entered at the second step. The globality dimension was entered at step 3.

Locus of causality, stability and controllability were entered at the final step. Years of experience and importance attached to the error did not significantly contribute to the equation. Error severity had no effects on the dependent variable (responsibility) either, indicating no group effects on the dependent variable. Globality dimension at step 3 explained 10 percent of the variance in the variable accepting responsibility. At step 4, locus of causality was found to contribute significantly to the equation, accounting for most of the variance (27 %) in the value of the dependent variable (responsibility). Removal of controllability dimension did not alter the  $R^2$  at step 4, indicating that most of the effects came from the variable locus of causality. The results suggested that if nurses make internal causal attributions in relation to the error, they were more likely to accept responsibility for the error. The results are shown in table 10.4.



**Table 10.4 Association of years of experience in nursing, importance attached to the error, globality, locus, stability, controllability with accepting responsibility. Summary of hierarchical regression analyses.**

<b>Accepting responsibility</b>		
<b>Predictor variables</b>	<b>Beta</b>	<b>R<sub>2</sub></b>
Years	-.10	.016
Importance	-.06	
-----	-----	-----
Severity of error	-0.07	.017
-----	-----	-----
Globality	.12*	.10
-----	-----	-----
Locus (internality)	.37 **	.27
Stability	.16	
Controllability	.08	

\* p < .5 \*\* p < .01

## 10.4 Discussion.

### 10.4.1 General findings.

The purpose of this study was to examine the types of attributions nurses make in response to an error with a serious and non-serious outcome and evaluate the clinical implications of the findings. On the whole, nurses in both the serious and

non-serious error conditions obtained higher than the mid-point scores in locus and controllability, although the scores of the nurses in serious condition were slightly higher than those in the non-serious condition. Both groups obtained low scores in the stability dimension. These indicate a tendency for both groups of nurses to perceive the cause of the error to be internal, controllable and unstable. However, there was a significant difference in the attribution of self-blame in response to the error, with more nurses in the serious outcome condition blaming themselves for the error than in the non-serious condition. Nurses also tended to attach more importance to the error if the outcome is severe than if it is not severe. Nurses in the serious outcome condition were more inclined to take responsibility for their error.

#### **10.4.2. Comparison with previous research.**

These findings seem to run counter with results of previous attribution research as well as the findings reported in chapter 8, which generally found that subjects tended to view the causes of success as more internal, stable and controllable. The causes of failure were perceived as more external. An error, particularly one with a serious outcome, would be expected to be viewed as a negative event akin to failure. According to attribution theory, this would be expected to trigger external causal attributions. But, this was not shown to be the case in this study.

A number of interpretations may be made as to why the results were counter in some ways to previous research. This may be because of the design of the study (i.e. the nurses were responding to an imagined error rather than an actual one), but more probably explained by nurses attitudes to accountability. Nurses are expected to be accountable for their actions, which is particularly emphasised in the UKCC's Code of Conduct (UKCC, 1992). This may account for this internal response to errors, and also the greater tendency towards self blame in serious outcome errors. The need to provide safe care is also paramount in professional

nursing practice (Hibberd and Norris, 1992), and nurses may feel they had let their patients <sup>down</sup> if they had harmed them as a result of their error (Arndt, 1994).

Where a patient has been harmed by an error (as in the serious outcome-condition), the nurse may feel she had no option but to accept blame for the error and report its occurrence. In this way, the nurse may try to limit any "damage" or repercussions arising from the error (Dejoy, 1990). In particular, accident with severe outcomes creates in the individual the need to make the "accident appear controllable and therefore avoidable in the future" (Burger, 1981). Findings from this study tends to indicate that a similar phenomenon may occur following an error with a serious outcome, with more nurses in this group claiming the cause of the error is controllable. The lower scores that the nurses in both groups obtained on the stability dimension also indicated that they perceived the cause of this error to be unstable, hence potentially changeable.

## **10.5 Implications of the study.**

### **10.5.1 Changes in practice.**

As nurses in both outcome conditions tended to make more internal causal attributions following an error, we might expect them to cope better with the error (Janoff-Bulman and Wortman, 1977) and also to be more likely to accept responsibility and make changes in their practice (Wu et al, 1992). However, there may be some drawbacks in this type of response as well. For instance, once the nurse has made an internal attribution to the error (i.e. blame herself or himself), she or he may ignore or discount the role of other factors in the causation of the error (Dejoy,1990), hence failing to take necessary actions to remedy any relevant organisational problems. In fact, it is postulated (e.g. Reason, 1990; also chapters 6 and 8) that multiple causes rather than a single cause interact to produce the errors and adverse events. Therefore, just focusing on one factor is unlikely to get to the root causes of an error.

### **10.6. Conclusion.**

The findings indicate that nurses may perceive "clearly defined errors" differently to inadequacies and omissions in care. While they may be expected to learn from their errors (particularly errors which have led to a serious outcome) and make constructive changes in their practice, it is less clear whether they would feel "internally" motivated to improve their practice with respect to inadequacies, omissions and "near-misses" in their day to day work because an important prerequisite in making changes in practice following an error is accepting one's role in the chain of events which produce errors and adverse events. It is therefore more likely that a system's approach to dealing with errors, omissions and inadequacies may be more effective in improving general safety and quality in nursing practice rather than an individual approach or undue focus on the outcome (i.e. error, omission or inadequacy). Thus, it is crucial to ensure that appropriate structures and systems are put in place to support clinical judgement and reduce potential risks. At the same time, nurses also need to be encouraged to accept responsibility for all aspects of their care, identify their learning needs and take full opportunities of appropriate courses and training to increase and/or maintain their competence.

Nurses should also appreciate that all types of errors have a potential impact on patients' care. Therefore, equal importance should be attached to all types of errors, regardless whether they have led to a serious outcome or not. Failure to do that may lead nurses to misjudge risks in clinical nursing practice and to fail to take adequate or appropriate preventative actions during the various stages of the process of nursing to ensure that quality and safe care are delivered to patient. As Dejoy (1985) argues, how a person appraises risks in the work situation will influence whether or not the person will take steps to minimise hazards in the work place.

*Chapter 10: Nurses' responses to errors with a serious and non-serious outcome*

The next chapter examines how assessment and care of patients with chest pain may be improved by using a system approach combined with appropriate training for the nurses, drawing together findings from all previous studies.

## **CHAPTER ELEVEN: REDUCING OMISSIONS AND INADEQUACIES IN THE ASSESSMENT OF PATIENTS WITH CHEST PAIN.**

### **11.1 Introduction.**

Errors and adverse events as previously noted are common and often serious problems in both medical and nursing practice (Hiatt et al, 1989; McL Wilson et al, 1995 ; Wu et al, 1991). Yet, the study of clinical errors, and particularly ways of preventing them, has been a neglected area of research enquiry (Vincent, 1994). As a result, there is limited understanding of how best to reduce errors and improve the quality and safety of professional health care. Although much is known about the chain of events which leads to accidents in other fields, this information is rarely used by clinicians and health service managers (Reason, 1995; Leape, 1994).

However, findings reported in the previous chapters provided not only some information about the types of errors and inadequacies (e.g. omissions) that occur in nursing practice but also what nurses perceived to be their causes. Although nurses perceived both errors and inadequacies in assessment and care of patients to be due to multiple causes, they appeared to make a distinction between the source of these causes for the two types of unsafe acts. For instance, they attributed the causes of more "defined" errors (particularly if they have led to adverse events) mostly to internal factors<sup>↓</sup>(e.g. inexperience) whereas the causes of less "defined" errors such as omissions and inadequacies in assessment and care were largely attributed to external (i.e. environmental or organisational) factors. These may affect the way they respond to these two types of occurrences. While they may be inclined to accept responsibility for errors and make constructive changes in their practice (see chapter 6), they may feel less responsible for general inadequacies in their care. In fact, they may perceive inadequacies in care more of a system-based problem, hence less controllable by

individual nurses. Besides their lack of awareness or appreciation of their own possible contribution to errors and inadequacies in care through inadequate knowledge and skills, the evidence also tends to indicate that nurses may not have full insight into the extent of errors and inadequacies that takes place in their practice (see chapters 7, 8 and 9). Findings reported in chapter 9 also revealed that they accorded less importance to minor errors than more serious errors. These kind of attitudes may affect the safety "health" of the clinical environment and promote error-producing conditions, making it more likely for errors and adverse events to be triggered (Reason, 1990; 1995).

These would indicate that strategies directed at "flaws" in the structures and systems in the work-place may have more impact on reducing errors than those more limited approaches aimed solely at individuals (Reason, 1990; Leape et al, 1995). Avorn et al (1992) argue that there is a need to "figure out what systems-oriented solutions can be applied to make things run more smoothly, safely, and efficiently for the benefit of the patients we care for". Even when an individual is seen to be primarily responsible for an error, it is also possible to point out the contribution of the system in the individual's erroneous behaviour. For instance, mistakes made because of lack of knowledge and skill may result from inadequate supervision of junior staff and lack of resources for training and education.

It is also argued in chapter 6 that there is a strong professional ethos among nurses, encompassing clinical responsibility and accountability with regards to their actions including any errors they may make in their practice. With the benefit of supervision, the statutory requirements and constructive support from senior staff/managers, nurses may be expected to respond positively to measures that are aimed to increase or maintain their level of clinical competence. It is

therefore crucial to ensure that appropriate structures and systems are also in place to support nurses' clinical judgement and professionalism.

### **11.1.1 Intervention strategies.**

As significant omissions were found in the assessment records of patients with chest pain (see chapter 7), the main thrust of this intervention study was to test whether a new system of care to patients with chest pain using critical care pathways would effect improvement in the assessment and care of these patients. The following strategies were used to introduce this change:

- 1) A critical care pathway for patients with chest pain was developed in conjunction with senior medical nurses, using key information derived from the literature relating to angina and myocardial infarction (see literature review in chapter 7). The care pathway was developed in several stages. The first stage of development involved reviewing the relevant literature on the assessment and care of patients with angina and myocardial infarction as well as literature relating to the use of care pathways in various settings. This allowed the relevant criteria relating to the assessment and care of patients with chest pain to be identified. Using the information derived from this exercise, a draft care pathway was developed by the researcher. This draft care pathway was used by the researcher in a pilot study (reported in chapter 7) as a data collecting instrument on ten patients admitted with chest pain to compare whether data recorded in their nursing documentation matched those in the care pathway. Although collectively most of the information in the care pathway could be found in the 10 nursing records, yet individually the records were found to contain a number of omissions. The draft care pathway can be found in the appendix<sup>3</sup>. After this initial development, the care pathway was subject to various reviews by the researcher on the basis of feedback from five experienced medical nurses. The consultation with the medical nurses consisted of giving them the draft care pathway and inviting them to comment whether the information relating to the assessment and



care of patients with chest pain reflected what they would normally do for these patients on the specified days and whether there were other things that they also did for these patients which were not in the care pathway. They were invited to write down their comments on the care pathway and discussed them with the researcher when the form was collected from them. After each round of consultation, the researcher would make appropriate changes to the care pathway and sent it back to the five nurses for further comments. Six round of consultations took place including two rounds after the care pathway was implemented on a trial basis. The final version of the care pathway was prepared after a consensus of agreement was reached relating to what information should be contained on the care pathway and also the general layout of the care pathway (this final version is found in appendix 7). This was the version that was used for the intervention study.

### **11.1.2 Issues relating to the implementation of changes in clinical care .**

It has been suggested that clinical guidelines can help to reduce errors of omission and commission in clinical care by providing a more specific, rigorous, standardised and structured approaches to care (Chassin, 1990). Despite its obvious appeal and benefits, the implementation of clinical guidelines have not always led to changes in practice, principally because not enough attention has been paid to the role of social influence in the successful implementation of guidelines (Mittman et al, 1992). Therefore, when implementing clinical guidelines, the role of behavioural norms and customs on clinical practice behaviour needs to be taken into account.

Thus, the strategies used in the implementation of the clinical care pathways were based on social influence theory and change (Greer, 1988; Lomas and Haynes, 1988). Social influence refers to the process by which "the behaviour of

one person has the effect or intention of how another person behaves, feels, or thinks about something (Zimbardo and Leippe, 1991).

The practitioners in the clinical areas selected for the introduction of care pathways were invited to participate in the development and review of the guidelines. Various studies have suggested that participatory guidelines development increases the likelihood of successful implementation (Spiegel et al, 1989; Gottlieb et al, 1990).

Another social influence strategy that was used in the implementation of the critical care pathways was the selection of a senior nurse on each ward as well as the participation of the senior clinical nurse and researcher as opinion leaders to direct the implementation of the guideline. Opinion leaders are respected individuals who are known to the target population. It has been suggested that they can exert significant influence in changing group norms and increasing adherence to consensus recommendations (Lomas et al, 1988).

With regards to the role of educational approaches in changing clinical behaviour, it has been found that the dissemination of content knowledge may be more effective if it is delivered by persons perceived as educationally influential (Stross and Bole, 1980). Thus, the researcher in his capacity as link teacher for the clinical areas used for the implementation of the care pathways, took a major role in giving individual and group teaching sessions on the principle of care pathways and methods of using them.

Thus, the first purpose of this study was to investigate whether the implementation of a care pathway for patients admitted with chest pain led to a reduction of omissions in the assessment of these patients.

A second purpose of this study was to examine whether the reduction in omissions in the assessment of patients with chest pain in turn had other effects on patient care, i.e. more effective pain relief, reduced pain and anxiety scores, prompt response to patients' pain, good pain control, better patients' knowledge, and improved patients' experience and satisfaction with care.

## **11.2 Methodology.**

### **11.2.1 Design.**

This study consisted of three phases as follows:-

1. In the first phase the documentation records of 60 patients admitted with chest pain were audited to identify the frequency of omissions from a list of criteria. A short structured interview was also used to test the patients' knowledge regarding their condition and treatment. Specific clinical indicators such as pain, anxiety level, experience of nursing care and satisfaction level were also evaluated. The data collection was over a period of two months and took place on three medical wards of one General Hospital NHS Trust.
2. The second phase of the study involved the implementation of a clinical care pathway for patients admitted with chest pain through the Coronary Care Unit (CCU). The duration of this phase was 3 months. Staff preparation regarding the use of the care pathways was done before and during the implementation of the care pathways.
3. The third phase took place four weeks after of the implementation of phase 2 and last 2 months. It was a repeat of phase 1 on 60 patients being nursed under the system of critical care pathways to evaluate whether there was any changes from phase 1 as a result of that implementation. Data collection took place on three medical wards following the patients transfer from the CCU.

### **11.2.2 Patients.**

Two samples of 60 patients admitted with chest pain were included in the study. Chest pain is used in this study as a diagnostic umbrella for angina and myocardial infarction. The first sample of 60 patients would be referred to as the 'baseline' group, and the second sample of 60 patients as the experimental group. Data were analysed for the 'baseline' group and compared with data from the experimental group. The 'baseline' group consisted of 19 patients admitted with myocardial infarction and 39 patients with angina, and the patients were nursed using the conventional (i.e. existing) system of documentation. The experimental group consisted again of 60 patients admitted with myocardial infarction (N=23) and angina (N=37), and they were nursed using the system of critical care pathways. There were 41 men and 19 women in the control group and this sample had a mean age of 65.3 (Sd 9.4 ). In the experimental group, there were 39 men and 21 women, the mean age being 63.1 (Sd 10.4 ). Age was recorded both as numerical and categorical variables during the data collection.

### **11.2.3. Inclusion Criteria.**

Only patients satisfying the following criteria were eligible to be included in the study:-

- 1) The patients were admitted only with angina and/or myocardial infarction
- 2) The patients in the 'baseline' group were nursed under the conventional (i.e. existing) system of documentation.
- 3) The patients in the experimental group were nursed under the critical care pathway system.
- 4) The patients were not critically ill or confused during the phases of data collection.

#### **11.2.4. Exclusion criteria.**

Patients who had any the following were not considered eligible and were excluded from the study:-

- 1) The chest pain was of non-cardiac origin
- 2) The chest pain (i.e. angina/myocardial infarction) occurred after the patient had been admitted to hospital for a different condition

Verbal consent to take part in the study was obtained from the patients prior to data collection after explaining the nature and purpose of the study to them.

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#### **11.2.5. Questionnaires.**

##### **11.2.5.1 The audit of nursing assessment questionnaire.**

The audit of nursing assessment questionnaire was used to evaluate the nursing assessment records of patients with angina/myocardial infarction. The development of this questionnaire was discussed in chapter 7. The effectiveness of the questionnaire to detect omissions and inadequacies in the assessment records of patients with chest pain was evaluated on a sample of 30 records (see chapter 7), and it was found to have good content validity. The internal consistency of the questionnaire and inter-rater reliability were also found to be good.

The audit questionnaire has a three point scale for each statement. A score of one is given if a criteria is not met, a score of two if the criteria is partially met, and three if it is fully met. The scores for all the criteria are then added together to obtain an audit score for each case. The maximum score that can be obtained is 48 and the minimum is 16.

A copy of the criteria for using this questionnaire is found in appendix 7.

#### **11.2.5.2 The audit of patients' knowledge of their condition and treatment.**

This consisted of 10 questions relating to patients knowledge about their condition, the factors which may have contributed to their angina or myocardial infarction, the medications they were taking and the type of activity they were allowed.

Each correct answer carries one point, giving a total of 10 points if all questions are answered correctly (the questions as well as the criteria for marking the patients' responses are listed in appendix 7). Patients need a good understanding of the area of knowledge covered by the above 10 questions for their successful rehabilitation. All the information elicited in the above questions can be found in the booklet normally given to patients following their admission for angina or myocardial infarction, and staff caring for these patients are expected to go over the booklet with them and discuss any areas of concern.

#### **11.2.5.3 The short form McGill Pain Questionnaire (SF-MPQ).**

The main component of the SF-MPQ consists of 15 descriptors (11 sensory, 4 affective) which are rated on an intensity scale as 0 = none, 1 = mild, 2 = moderate or 3 = severe. Three pain scores are derived from the sum of the intensity rank values of the words chosen for sensory, affective and total descriptors. The SF-MPQ also includes a visual analogue scale (VAS) and the present pain intensity (PPI). The SF-MPQ had been shown to compare very well with the standard McGill Pain Questionnaire (MPQ), and was found to be sensitive to demonstrate differences due to treatment at statistical levels comparable to those obtained with the standard form (Melzack (1987)).

#### **11.2.5.4 The Beck Anxiety Inventory (BAI).**

The BAI is a 21 item questionnaire designed to assess symptoms of anxiety in a clinical population. Each item is rated on a four point scale (0-3) and a total score derived which can be compared with those from clinical and non-clinical populations. A score of 0-9 is normal; 10-19 indicates mild to moderate anxiety;

19-29 moderate to severe anxiety and 30-63 severe anxiety. The questionnaire correlates well with other standard measures of anxiety.

A copy of this questionnaire is found in the appendix 7.

#### **11.2.5.5 Newcastle Satisfaction with Nursing Scales (NSNS).**

This self-administered questionnaire was developed by Thomas et al (1996) to evaluate nursing interventions. It was tested on a sample of 2078 patients in general and surgical wards in five hospitals, and was found to have good internal consistency and construct validity. The NSNS comprised three sections as follows:

##### **a) Experiences of nursing care scales**

This scale consisted of a series of 26 statements on aspects of nursing rated on a seven point Likert scale. To avoid affirmation bias, a mixture of 15 positively and 11 negatively worded statements were included. Responses across all items were summed and transformed to yield an overall experience score, with a potential range of 0-100, where 100 represents the best possible experience.

##### **b) Satisfaction with nursing care scale.**

This section comprised 19 items. Participants were asked to rate their satisfaction with various aspects of nursing care, using a five point Likert scale. Responses across all items were summed and transformed to yield an overall satisfaction score of 0-100, in which 100 denoted complete satisfaction with all aspects of nursing care.

##### **c) Demographic information**

The final section concerned information about the patient and details of the stay in hospital.

A copy of the questionnaire is in appendix 7.

Ethical approval to carry out this study was sought and obtained from the Northampton Medical Research/Ethics Committee. The terms of the protocol as agreed by the Ethical Committee were adhered to throughout the research.

### **11.2.6 Procedure.**

#### **11.2.6.1 The 'baseline' group.**

Sixty patients admitted with chest pain and who satisfied the inclusion and exclusion criteria were selected for phase one of the study. Data were collected on these patients from at least 48 hours after their admission to the hospital and after they had been transferred to the three medical wards from the Coronary Care Unit (CCU).

#### **11.2.6.2 Intervention Strategies.**

1) A critical care pathway (see appendix 7) for chest pain was implemented in the CCU and three medical wards.

2) Preparation of staff.

Staff in all the clinical areas (CCU and three medical wards) selected for the study were prepared in the following ways before the introduction of the critical care pathways:

a) The rationale of the study was discussed with the senior clinical nurse for the medical unit and the ward sisters of the CCU and three medical wards and their support was enlisted.

b) The study proposal, aims and rationale were discussed at the medical unit meeting attended by senior nurses. A copy of the proposal was also distributed to the CCU and the 3 medical wards. The staff were invited to discuss any points relating to the study with the researcher.

c) One senior nurse from each ward and the CCU was fully prepared by the researcher with regards to the nature and aims of the study, the principle of critical care pathways, methods of implementing the care pathways to the ward or unit and methods of preparing and supervising the staff in using them. The senior nurses were also required to ensure that patients being nursed under the care pathways' system had a nurse responsible for their care (i.e. a named nurse).



d) Twice weekly visits by the researcher to the wards and CCU to conduct group and individual teaching sessions and personal support with qualified nurses regarding the principle and use of the care pathways. The teaching sessions were carried out over a period of two months before the implementation of the care pathways and additional twice weekly sessions were also given after the implementation of the care pathways to discuss issues and difficulties relating to the use of the care pathways.

e) Distribution and discussion of relevant literature on care pathways to the three medical wards and CCU

f) Further attendance at the medical unit meeting by the researcher to present feedback relating to the initial implementation of the care pathways on the three medical wards and CCU.

Some of the materials used in staff preparation are found in appendix 7.

#### **11.2.6.3. The experimental group.**

Sixty patients being nursed under the system of critical care pathways were selected for phase 3 of the study. This phase commenced five weeks after implementation of the critical care pathways for patients with chest pain after any difficulties in the use of this system were ironed out. Data were collected on the patients who satisfied the inclusion and exclusion criteria as they were transferred to the three medical wards from the CCU over a period of six weeks when the sample criteria was reached. The same procedure as in phase 1 of the study was used.

#### **11.3. Results.**

All patients selected (60 in the 'baseline' group and 60 in experimental group) for the study completed all the stages of the study. Prior to analysis, the data were screened for accuracy of data entry as recommended by Tabachnick and Fidell (1989). There were no missing data.

**11.3.1. Comparison between the two groups on demographic data.**

The 'baseline' and experimental groups were compared to see whether there was any significant difference in the demographic data. As table 11.1 shows, the two groups are very similar on most of the demographic data. With regards to the diagnostic categories, there was slightly more patients in the experimental group diagnosed with myocardial infarction. However, this was not found to be significant.

**Table 11.1. Comparison of the demographic data between the 'baseline' and experimental groups.**

Demographics	Baseline group % (number)	Experimental group % (number)	Chi-square value	Df	P value
<b>Age</b>					
35-45	1.7 (1)	3.3 (2)			
46-55	16.7 (10)	23.3 (14)			
56-65	28.3 (17)	30 (18)			
66-75	36.7 (22)	30 (18)			
76-85	16.7 (10)	13.3 (8)	7.3	4, 112	NS
<b>Gender</b>					
Male	68 (41)	65 (39)			
Female	31.7 (19)	35 (21)	.15	1, 114	NS
<b>Education level</b>					
Basic (up to 16)	93.3 (56)	86.7 (52)			
Further (17+)	6.7 (4)	13.3 (8)	1.9	1, 114	NS
<b>Diagnosis</b>					
Myocardial infarction	35 (21)	38.3 (23)			
Angina	65 (39)	61.7 (37)	6.5	1, 114	NS
<b>Length of stay</b>					
1-5 days	81.7 (49)	75 (45)			
6-10 days	8.3 (5)	23.3 (14)			
11-15 days	10 (6)	1.7 (1)	16.4	4, 116	NS

\*  $p < 0.05$  \*\*  $p < 0.01$  NS = non-significant

N.B. The chi-square test was used to compare the observed frequencies of cases with their expected frequencies. This test was considered as appropriate because of the categorical nature of the data. Moreover, as no expected frequencies in the variables which have more than two categories were smaller than one (or more than 20 % of the expected frequencies were smaller than 5), the data meet the criteria on using the chi-square test.

There was no significant difference in the distribution of the 60 patients between the three medical wards in the two groups. The results are shown in table 11.2.

**Table 11.2 Distribution of patients on the three medical wards.**

Wards	Baseline group % (number)	Experimental group % (number)	Chi-square value	Df	p value
Medical ward 1	31.7 (19)	38.3 (24)	3.21	2, 118	NS
medical ward 2	38.3 (23)	25.0 (15)			
medical ward 3	30.0 (18)	36.7 (21)			

### 11.3.2. Quality of the assessment of patients with angina/myocardial infarction.

Table 11.3 compares the record of assessment of the core criteria in the baseline and experimental group. On the whole, the assessment of the patients in the baseline group was superficial and contained a number of omissions. Details will follow below. In contrast, examination of the assessment records of patients in the experimental group reveals very few omissions. The assessment was very comprehensive, and included the full assessment of virtually all the criteria identified as relevant. Using the scoring criteria of 1 point for not met, two points for partially met and three points for fully met, the baseline group obtained a mean audit score of 29.7 (out of a maximum of 48) whereas the experimental group obtained a mean score of 45.2 (out of a maximum of 48).

**Table 11.3. Comparison of assessment of patients with chest pain between baseline and experimental groups.**

	<b>Groups (baseline and experimental)</b>					
	<b>Base</b>	<b>Exp.</b>	<b>Base</b>	<b>Exp.</b>	<b>Base</b>	<b>Exp</b>
<b>Criteria</b>	<b>Fully met %</b>	<b>Fully met %</b>	<b>Partially met %</b>	<b>Partially met %</b>	<b>Not met %</b>	<b>Not met %</b>
<b>History of development of chest pain</b>						
Presenting complaint recorded	51.7	88.3	46.7	0	1.7	11.7
Past medical history recorded	81.7	100	16.7	0	1.7	0
Current medication recorded	41.7	100	16.7	0	41.7	0
History of chest pain recorded	23.3	96.7	45	3.3	31.7	0
Description of pain recorded	18.3	100	45	0	36.7	0
Intensity of pain recorded	10	98.3	23.3	0	66.7	1.7
<b>Physiological/physical observations</b>						
Association of pain with other signs/symptoms	21.7	98.3	21.7	1.7	56.7	0
Vital signs (BP, pulse, resp.) recorded	53.3	95	33.3	3.3	13.3	1.7
ECG recorded	16.7	56.7	45	43.3	38.3	0
Assessment of haemodynamic effect recorded	15	88.5	11.7	10	73.3	1.7
Weight recorded	16.7	48.3	--	1.7	83.3	50
<b>Response/knowledge</b>						
Psychological reaction to chest pain recorded	1.7	66.7	16.7	26.7	81.7	6.7
Knowledge level of condition recorded	8.3	65	28.3	33.3	63.3	1.7
<b>Lifestyle</b>						
Smoking pattern recorded	58.3	98.3	1.7	1.7	40	0
Dietary pattern recorded	46.7	98.3	35	1.7	18.3	0
Drinking pattern recorded	20	88.3	13.3	11.7	66.7	0

Base = baseline group Exp.= Experimental group

### 11.3.3. Comparison of the mean audit scores of the two groups.

In order to ascertain whether the difference in the mean audit scores between the baseline and experimental groups is statistically significant, one-way ANOVA was carried out. The results of the ANOVA showed that the scores obtained by the two groups in the subscales as well as the total audit score demonstrated statistically significant differences. The results are displayed in table 11.4

**Table 11.4. Comparison of audit scores between control and experimental groups.**

Criteria (subscale)	Baseline mean (Sd)	Experimental mean (Sd)	Df	F-value
History of development of chest pain	12.4 (1.8)	17.9 (.4)	1,119	51.03**
Physiological/physical observations	8.6 (2.1)	13.3 (1.3)	1,119	22.59**
Response/knowledge	2.7 (.9)	5.3 (.9)	1,119	25.41**
Lifestyle	6.0 (1.9)	8.7 (.9)	1,119	95.9**
Total audit score	29.7 (5.0)	45.2 (3.0)	1,119	61.47**

\*\* p < 0.01

### 11.3.4. Areas of deficiencies.

When the data relating to the audit in the baseline and experimental groups were examined (as shown in tables 11.2 and 11.3), major deficiencies were found in the assessment records of patients in the baseline group compared to that of the experimental group in the four key areas as follows:

#### 11.3.4.1 History of development of the chest pain

In the baseline group, the aspects of the pain which was particularly poorly assessed were the history of the chest pain, description of the pain, intensity of pain

and the medication which the patients were currently taking. Eighty one percent of the records showed full assessment of past medical history and 51.7 % showed that the patients presenting complaints were fully recorded. The compliance in all the six criteria relating to the assessment of the history of the development of the chest pain were over 88 % in the experimental group.

#### **11.3.4.2. Physiological and physical observations.**

The areas which were poorly recorded in the assessment records of patients in the baseline group compared to those of the experimental group were symptoms and signs related to the cardiac condition, ECG, assessment of haemodynamic effect of the condition and assessment of weight. Vital signs were fully recorded in 53.3 % of cases in the control group compared to 95 % in the experimental group.

#### **11.3.4.3. Knowledge and psychological response.**

The patients' psychological reaction to their condition and their knowledge about their condition were mostly omitted in the assessment record of the patients in the baseline group, with less than 9 % of the records that these criteria were fully assessed. In contrast , assessment of these two criteria was recorded in over 65 % of the assessment records of patients in the experimental group.

#### **11.3.4.4. Lifestyle.**

The assessment of smoking was recorded in 58.3 % of the assessment records of patients in the baseline group, and that of diet and drinking pattern was recorded in 46.7 % and 20 % of cases respectively. In the experimental group, all three criteria were assessed in over 88 % of cases.

#### **11.3.5. Influence of intervention on clinical indicators.**

The results reported above showed that the implementation of the care pathway had a significant impact on the reduction of errors and inadequacies in the as-

assessment of patients with chest pain. It is important to examine whether this feeds through to have a clinical impact. This was evaluated by testing whether or not there were changes in selected patients' variables (clinical indicators) following the implementation of the care pathway for the assessment and care of patients with chest pain. Thus, one-way analysis of variance was carried out to analyse data sets on various clinical indicators comparing the two groups. The results are shown in table 11.5.



**Table 11.5. Comparison of the two groups on physiological indicators, cognitive indicators, satisfaction with care outcomes. Results of one-way ANOVA.**

Patients' variables	Control	Experimental	F value	df	p value
	Mean (Sd)	Mean (Sd)			
<b>Physiological indicators</b>					
Pain scores (score 0-45)	12.2 (6.2)	9.2 (3.7)	10.5	1, 118	< .0016 **
Pain level (scale 1-5)	2.9 (1.0)	2.9 (0.9)	.0089	1, 118	.925
Relief of pain (scale 1-3)	2.0 (0.9)	2.9 (0.47)	44.2	1, 118	< .0000 **
<b>Cognitive indicators</b>					
Anxiety scores (BAI score 0-63 )	16.9 (9.0)	13.8 (7.5)	3.9	1, 118	.05
Knowledge (score 0-10)	7.3 (2.1)	8.6 (2.0)	11.6	1, 118	< .0009 **
<b>Satisfaction with care</b>					
Experience of care (score 0-100)	85.7 (0.76)	93.6 (5.6)	40.1	1, 118	< .0000 **
Satisfaction with care (score 0-100)	82.2 (12.4)	91.9 (9.4)	23.7	1, 118	< .0000 **

\* p < .05 \*\* p < .01

Table 11.5 shows the means and standard deviations for pain scores, pain level, relief of pain, anxiety scores, knowledge level, experience of nursing care and satisfaction with care. With the exception of pain level and anxiety scores, all of

the indicators appear to improve in the experimental group. This observation was confirmed by the analysis of variance which was used to compare changes in the clinical indicators following the implementation of the care pathway for patients admitted with chest pain, the between -group main effects yielding significant F ratios. An increased number of patients was also aware that there was a named nurse responsible for their care in the experimental group compared to the baseline group, 31.7 % (N=19) and 76.7 % (N=46) respectively. This was found to be highly significant by a chi-square test (  $p < 0.0001$ ).

#### **11.3.6. Changes in nursing behaviours.**

Following implementation of the care pathway, the results indicate improvement in certain nursing activities such as monitoring of arrhythmias, recording planned activity regime for patients, prompt response to patients' chest pain and improved control of chest pain. This observation was confirmed by a one-way ANOVA, which shows the differences between the data sets to be highly significant. The results are displayed in table 11.6.

**Table 11.6. Comparison of nursing behaviours between the baseline and experimental groups.**

Nurse's variables (Nursing behaviours)	Baseline Mean (Sd)	Experimental Mean (Sd)	F- value	Df	P-value
Monitoring of arrhythmias (scale 1-3)	1.6 (0.82)	2.3 (0.9)	17.3	1,118	<.0001**
Planned activity (scale 1-3)	1.5 (0.7)	3 (0.1)	30.1	1,118	<.0000**
Prompt response to pain (scale 1-5)	4.4 (0.72)	4.9 (0.44)	15.7	1,118	<.0001**
Good control of pain (scale 1-5)	4.2 (0.8)	4.9 (0.43)	12.0	1,118	<.0000**

\*\* p < 0.001

Thus, the results discussed above showed significant differences between the baseline and experimental groups on audit scores, nursing behaviours, patients' variables and satisfaction with care outcomes, suggesting that the intervention had a crucial role in these changes. The possibility that the differences may be spurious (i.e. due to demographic differences) was also considered, and the evidence did not support this.

Further analyses will now be carried out to ascertain the different ways in which the intervention might have exerted its influence on the process of change. These will now be reported.

**11.3.7. Factors influencing satisfaction with care outcomes.**

Satisfaction with care outcomes are frequently used to measure effectiveness of clinical intervention in health care audit and research. In a one-way ANOVA, experience of nursing care and satisfaction with care were found to vary significantly between the two groups as shown in table 11.5. Patients' awareness of having a named nurse was also associated with more positive experience of nursing care ( $F= 6.7$ ,  $df 2,118$ ,  $p < .01$ ) and with greater satisfaction with care ( $F= 3.4$ ,  $df 2,118$ ,  $p < .05$ ). There was also a two-way interactions between group and patients' awareness of having a named nurse on experience of nursing care ( $F= 9.6$ ,  $df 2,118$ ,  $p < .001$ ). This may indicate that when a specific nurse (i.e. named nurse) deliver care to patients using a systematic approach of assessment and intervention inherent with the care-pathway system, patients may feel more positive about their care. As the main thrust of the intervention study was the use of a new system of assessment of care of patients and having a nurse on each ward responsible to co-ordinate this new approach to nursing and to act as named nurse for these patients, the results indicate that the interventions had a direct effect on experience of nursing care and satisfaction with care.

To examine what other variables were associated with experience of nursing care and satisfaction with care, Pearson's correlation was carried out. The results are shown in table 11.7.

**Table 11.7. Variables associated with satisfaction with care outcomes.**

Variables	Outcome measures	
	Experience of care	Satisfaction
Patient assessment (audit score)	.29 **	.25 **
Pain score (McGill)	-.12	-.19 *
Anxiety score (BAI)	-.17 *	-.13
Patient's knowledge	.4 **	.32**
Pain relief	.12	.13
Prompt response	.53 **	.53 **
No problems	.33 **	.32 **
Good pain control	.49 **	.47 **
Planned activity	.33 **	.26 **

\*  $p < .05$  \*\*  $p < .001$

Inspection of table 11.7 shows that patient assessment (reflected by audit score), prompt response to the patients' pain, good pain control, patient's knowledge about their condition and intervention, and not having experienced any problems with their care and planned activity are all highly significantly correlated to experience of care as well as satisfaction with care. Pain score had a weak negative correlation with satisfaction with care and anxiety scores (BAI) had a weak correlation with experience of care. There was no significant correlation between pain level and experience of care and satisfaction with care.

Hierarchical regression was then employed to determine if addition of nurses' behaviours and patients' clinical variables improve prediction of experience of nursing care and satisfaction with care beyond that afforded by patient assess-

ment (audit score). It is postulated that patient assessment would influence nursing behaviours and patient's clinical variables, and ultimately would have an impact on experience of nursing care and satisfaction with care, hence the reason for entering patient assessment first, nursing behaviours second and patient's clinical variables third. Table 11.8 displays the results of the regression analysis at the various steps, using experience of nursing care as the dependent variable.

**Table 11.8. Predictors of experience of nursing care**

Predictor variables	Beta	R <sub>2</sub>
<b>Intervention</b>		
Patient assessment (audit score)	.29 **	.08
<b>Nursing behaviours.</b>		
Prompt response to patient's pain	.39 **	
Close monitoring of arrhythmia	-.14	
Relief of pain	-.05	
Good control of pain	.14	
Planned activity for patient	.16	.34
<b>Patient's clinical variables</b>		
Patient's anxiety scores	-.17*	
Patient's knowledge level	.28	
Pain analogue	.07	
Pain scores	.06	.44

\* p < .05    \*\* p < .01

At the first step, patient assessment (audit score) was entered, and it was found to be significantly related to experience of nursing care, but explaining only 8 % of the variance. Nursing behaviours were then entered. Prompt response was found to be highly significant predictor of satisfaction of care. The variables related to nursing behaviours explained 34 % of the variance of the dependent variable. When patient's variables were entered at step 3, the R<sub>2</sub> increased from 34 to 44. The results are shown in table 11.8.

The same technique was used to assess the influence of selected predictor variables on satisfaction with care. The results are shown in table 11.9. Again, patient assessment (audit score) was found to be a significant predictor of satisfaction with care. When nursing behaviours were entered at step two, the  $R_2$  increased from 6 % to 30 %. Addition of patient's clinical variables did not significantly improve  $R_2$ .

**Table 11.9. Predictors of satisfaction with care.**

Predictors	Beta	$R_2$
<b>Intervention.</b>		
Patient assessment (Audit score)	.25**	.06
<b>Nursing behaviours</b>		
Prompt response to patient's pain	.39 **	
Close monitoring of arrhythmia	-.04	
Relief of pain	.004	
Good control of pain	.15	
Planned activity	.06	.31
<b>Patient's clinical variables</b>		
Patient's anxiety scores	-.03	
Patient's knowledge level	.04	
Pain analogue	.01	
Pain scores	-.12	.32

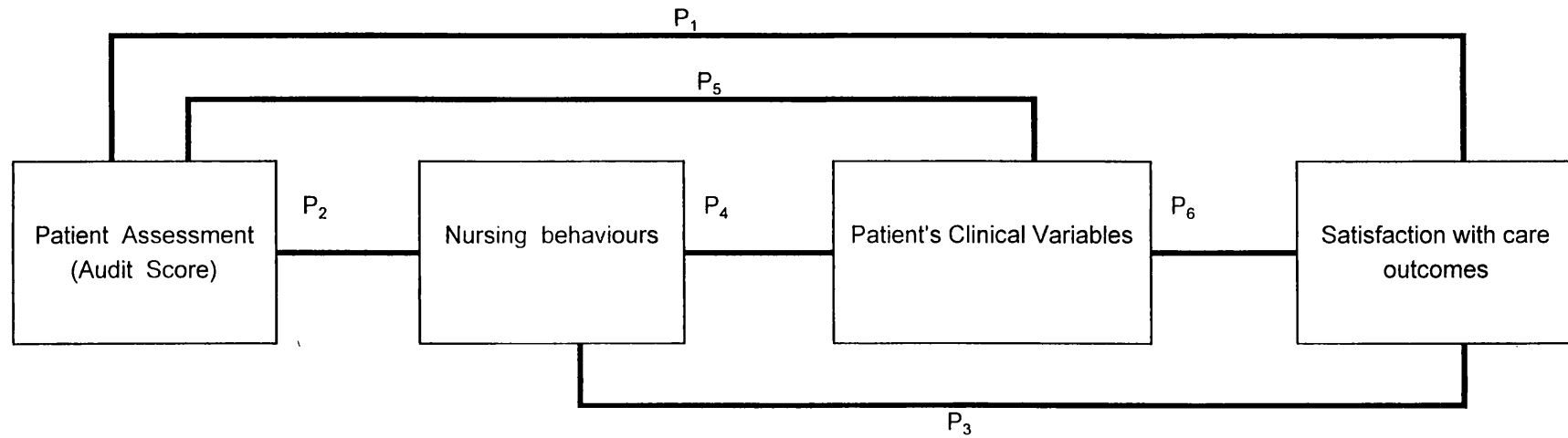
\*  $P < .05$  \*\*  $P < .01$



The hierarchical regression analyses indicated that patient assessment (audit score), nursing behaviours and patients' variables all contributed to satisfaction with care outcomes. The exact way in which these variables influenced satisfaction with care outcomes was not completely clear. A path analysis (using only the most powerful predictors of satisfaction with care outcomes, i.e. patient assessment, prompt response to patient's needs, and patient knowledge of his/her condition and clinical intervention required) was therefore used to examine the pattern of relationships between these variables. The aim of path analysis is to provide quantitative estimates of the causal connections between sets of variables (Bryman and Cramer, 1990).

Figure 11.1 shows the likely causal connections between these variables. The arrows, moving from left to right, indicated the expected causal connections between variables. Each  $p$  denotes the causal path.

Figure 11.1 Path diagram for satisfaction with care outcomes (experience of nursing care and satisfaction with care)



The model proposes that patient assessment (audit score) has a direct effect on satisfaction with care outcomes (path 1), and an indirect effect of patient assessment on satisfaction with care outcomes is also proposed. For example, patient assessment affects patients' clinical variables (path 5) which in turn affects satisfaction with care outcomes (path 6). Patient assessment affects nursing behaviours (path 2) which affects patients' variables (path 4). In addition, nursing behaviours have a direct effect on satisfaction with care outcomes (path 3). Finally, patients' clinical variables have a direct effect on satisfaction with care outcomes (path 6).

In order to provide estimates of each of the postulated paths, path coefficients were computed. This is shown in figure 11.2. Since the path coefficients are standardised, they can be compared directly. The path coefficients are computed by setting up three structural equations, one for nursing behaviours (prompt response to patient's needs), one for experience of nursing care and one for patient's clinical variables (level of knowledge about condition and clinical intervention). The three equations are as follows:

**Equation (1):**

Dependent variable= experience of nursing care,  
predicted from patient assessment (audit score), prompt response and patients knowledge.

The coefficients for patient assessment, prompt response and patient's knowledge in (1) will provide p1, p3 and p6 respectively.

**Equation (2):**

Dependent variable= patient's knowledge,  
predicted from patient assessment and prompt response.

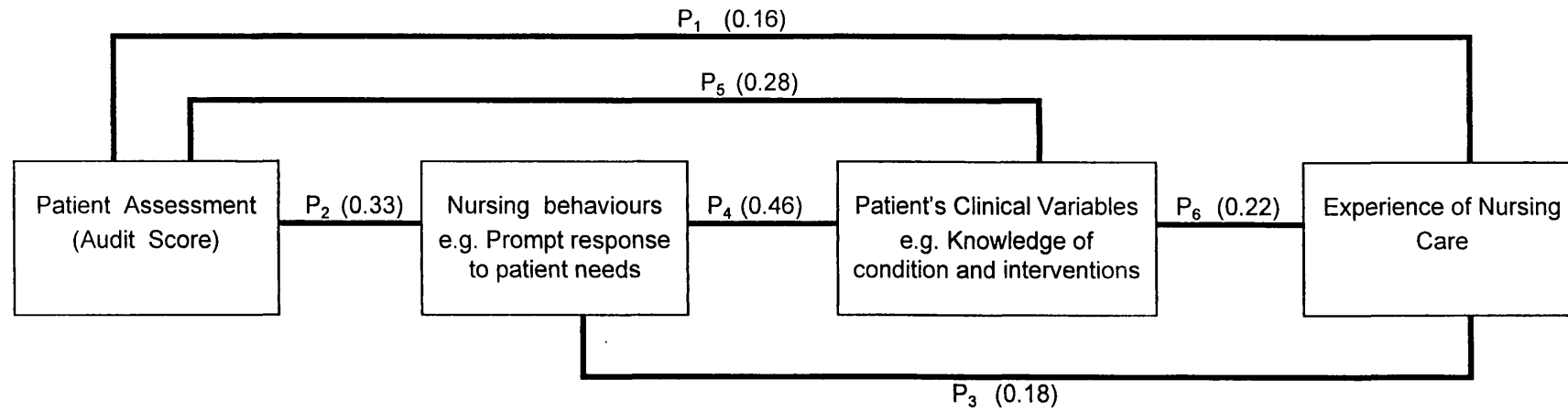
The coefficients for patient assessment and prompt response in (2) will provide p5 and p4 respectively.

**Equation (3):**

Dependent variable = Prompt response to patient's needs,  
predicted from patient assessment (audit score)

The standard coefficient for patient assessment in (3) will provide p2.

Figure 11.2 Path analysis for experience of nursing care

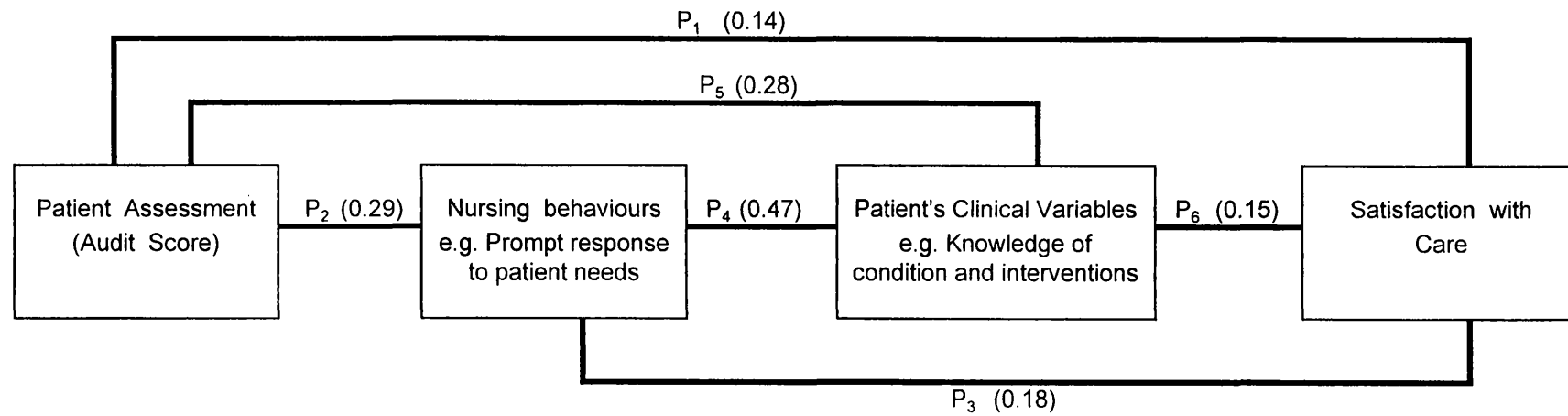


The results (figure 11.2) indicate that patient assessment (audit score) has a direct effect on experience of nursing care (path 1=.16). There is also a number of indirect effects. There is a sequence that goes from patient assessment to knowledge (path 5=.28) to experience of nursing care (path 6=.22); a sequence that goes from patient assessment (audit score) to prompt response to patient's needs (path 2=.33) to knowledge (path 4=.46) to experience of nursing care (path 6=.22). The causal links postulated in figure 11.1 were supported by the path coefficients.

The overall impact of patient assessment on experience of nursing care was then calculated by adding the indirect effects of patient assessment<sup>to</sup> its direct effect (.16) on experience of nursing. The indirect effects are obtained by multiplying the coefficients from each path from patient assessment to experience of nursing care. The path from patient assessment to knowledge to experience of nursing was calculated as (.28) (.22)= .06. The sequence from patient assessment to response to experience yields (.33) (.18)= .06. The sequence from patient assessment to response to knowledge to experience yields (.33) (.46) (.22)= .03 . Thus for the total effect of patient assessment on experience of nursing care is (.06)+ (.06)+ (.03)=.15. The direct effect of audit (.16) is added to the total indirect effects (i.e. .16+.15=.31). Thus patient assessment had a significant impact on experience of nursing care.

The path analysis was repeated with satisfaction with care. An almost similar pattern of causal links was observed (due to the high inter-correlation between experience of care and satisfaction with care). The results are displayed in the path diagram in figure 11.3.

Figure 11.3 Path analysis for satisfaction with care.



#### **11.4. Discussion.**

The findings show that following the implementation of the care pathway for patients admitted with myocardial infarction and angina, the quality of the nursing assessment was significantly improved, with very few omissions observed in the assessment records. There were also indications that the quality of care too have improved as a result of this intervention, reflected in higher satisfaction with care outcomes.

##### **11.4.1. Audit of the assessment records of patients with chest pain.**

The assessment records of the patients in the baseline group were inadequately completed, and contained a number of omissions. The main areas of inadequacies were assessment of problems associated with angina/myocardial infarction, assessment of potential complications, assessment of patients' knowledge of their condition and the psychological response to the chest pain. Assessment of patients' lifestyle was particularly poorly carried out. These results are broadly similar to the preliminary findings of the study reported in chapter 7.

Since the assessment of the key aspects of the patients' condition was not recorded, it would have been difficult for nurses to get an overall picture of the patients from the documentation records. For instance, novice nurses, nurses who were unfamiliar with nursing patients with chest pain and nurses who did not normally work on those particular wards (such as bank nurses or nurses who had been moved from other wards ) would not be able to discover from the nursing records the severity of the patients' condition and the specific types of nursing interventions that were required unless they were given supplemental information and support from more senior and ward-based staff. Since these wards tend to be very busy and the nurses frequently reported of work overload as discussed in chapter 7, it was unlikely that junior and novice nurses would receive the level of supervision they required to deliver quality and safe care. As a result, the



deficiencies in the patients' assessment records may have constituted a potential risk for nurses to make errors and omissions, especially if the local circumstances were suddenly to change significantly (Reason, 1990), such as if one or more experienced staff were absent and had to be replaced by less experienced staff of staff who are unfamiliar with the patients' conditions.

In contrast, the assessment records of the patients nursed under the critical pathway system were more comprehensively completed, with only minor omissions in the main assessment criteria. This indicates that when appropriate prompts are available within the assessment documentation, the nurse is more likely to seek that information when carrying out the patient's assessment and to record the findings. For instance, Sarter and Woods (1994) argue that there are gaps in clinicians professional knowledge; and Bransford et al (1986) have suggested that knowledge may be inert, and therefore cannot be activated when it is required in problem-solving situations. Similarly, findings reported in chapter 8 also indicate that nurses clinical knowledge of angina and myocardial infarction may not be complete and that they may not be fully aware of the gaps in their knowledge. Thus, the use of clinical guidelines such a care pathway may help to nullify or reduce the problems relating to the application of knowledge in nursing practice, hence reducing the risk of errors and omissions in care.

#### **11.4.2. Effects of interventions on specific outcomes.**

The experimental group tends to vary from the baseline group on a number of clinical indicators. There are indications that the introduction of the new system of care assessment and intervention had played a role in the differences between the pre and post-intervention groups, both through direct and indirect effects.

#### **11.4.2.1 Physiological outcomes.**

Patients nursed under the system of critical care pathway had lower reported pain scores. Pain relief was also recorded as being used slightly more often than in the baseline group. Post intervention recording of arrhythmias and planned activity regime was also higher. These might indicate that the more targeted and structured assessment inherent with the critical care pathway system as well as the stipulation that there should be an identified nurse co-ordinating the care may have enabled the nurse to assess the patients' pain more objectively and to give appropriate pain relief and more prompt response to the patients' pain. It would also appear that the patients condition was better monitored and interventions such as permitted activity regime was planned more explicitly according to the patients' condition.

#### **11.4.2.2. Anxiety reports and knowledge level.**

Patients in the post intervention group also reported less anxiety and slightly better knowledge of their condition and treatment than those patients in the baseline group. Since the care is mapped out for the whole duration of the patients' stay in the critical care pathway, it was possible that the patients were better informed of their condition and treatment which could have had an effect on the level of anxiety they felt.

#### **11.4.2.3. Lifestyle assessment.**

Omissions in the assessment of lifestyles and habits were considerably fewer in the records of patients in the post-intervention group than in the baseline group or the study previously reported in chapter 7. This would indicate that nurses would assess patients more holistically and not just focus on the immediate problems if they are given appropriate prompts in the assessment documentation. The fact that the critical care pathway allows assessment to be carried over a period of

time rather than just on admission may have contributed to the more comprehensive lifestyle assessment observed in the experimental group.

#### **11.4.2.4. Experience of nursing care and satisfaction scores.**

In the post-intervention group, the patients' experience of their nursing care as well as their satisfaction level were better than that of the baseline group. The influence of the interventions on experience of nursing and satisfaction with care may have been both direct and indirect. For instance, better patient's assessment and documentation records (as reflected by the audit score) as well as the allocation of a nurse to co-ordinate the care have a direct effects on the satisfaction with care outcomes. Indirectly, the interventions may have influenced nursing behaviours in a positive way, making them more prompt in responding to the patient's chest pain, in giving pain relief and alleviating their anxiety. In turn, the results indicate that nursing behaviours also had positive effects on experience of nursing and satisfaction with care.

In the path analysis, it was found that when the direct effect of patient assessment on satisfaction with care outcomes was added to the indirect effects, audit was found to have a significant impact on these outcome measures. For instance, audit (patient assessment) affects nursing behaviour, i.e. thorough and specific assessment of the patient is expected to make the nurse more aware of the patient's needs and problems as well as what interventions are required and in what order. The care pathway (intervention) consists of various "prompts", reminding the nurse of the assessment and care that are required at different stage of the patient's stay in hospital; and as the patient's co-operation and participation are required to implement the assessment and care, the nurse would be expected to communicate these information to the patient, hence the increase in patient's knowledge. Audit (patient assessment) have a direct effect on satisfaction with care outcomes possibly because the thorough and specific assessment inherent

with the care pathway is likely to induce confidence in the patient that his/her assessment and care are being competently managed.

The path analysis also indicated that nursing behaviours (prompt response to patients' needs and problems) and patients' knowledge of their condition and treatment had the biggest effect on the satisfaction with care outcomes. Patients' perception of their pain and anxiety state did not have a significant impact on satisfaction with care outcomes as demonstrated in the hierarchical regression. This would indicate that patients' experience and satisfaction with their care are influenced primarily by thorough assessment and care, by positive and empathic nursing behaviours and by being better informed about their condition and treatment. The effects of their clinical condition have a lesser influence on their experience of nursing care/satisfaction with care.

### **11.5. Implications of the study.**

The study has a number of implications relating to the improvement of quality and safety in nursing care.

#### **11.5.1. The audit questionnaire.**

The audit questionnaire was found to be sensitive in evaluating the quality of assessment records of patients with chest pain. In addition to satisfaction with care outcomes, it has been suggested that a standard measure of quality may be generated from reports concerning errors in nursing practice and studies of the factors that influence incident rates in hospitals (Wan and Shuckla, 1987). Thus, the identification of omissions that nurses make in the assessment and care of patients, as was the focus in this study, may provide good indicators of quality and point areas of deficiencies where specific actions can be targeted.

**11.5.2. A system approach to making improvement in nursing practice.**

Research in accidents in other areas (e.g. Reason, 1990) have found that systems failures play a significant role in the causation of these accident, and it has been suggested that a system approach should be used as a first step in any error prevention program. Findings from this study relating to the implementation of care pathway (which was a change in the system of assessing patients and implementing care) and the assignment of responsibility of co-ordinating care to a specific nurse indicate that this approach can be implemented effectively to the clinical situation to reduce deficiencies in patients' care. For instance, the quality and accuracy of nursing records have long been a source of concern, although various resources have been targeted to improve them (Elliat, 1994; UKCC, 1993; UKCC, 1992; Beeston, 1988; NHS Training Directorate, 1993,1994; Smith, 1993; Berwick & Richards, 1994), like the national campaign ("keeping the records straight") to increase awareness of good record keeping. However, these measures have failed or had minimal results because they had not fully taken into account the skill-mix on the ward, the increased turn-over of patients, staff shortage, and the explosion of clinical knowledge. Since care-pathways detail the care that a patient needs to receive over the entire episode of the patient's stay in hospital and could provide a guide of the patient's requirement for care to nurses of different level of experience and skills, more widespread implementation of the care pathways may contribute significantly to the improvement of nursing records and care which in turn may reduce variances in care.

**11.5.3. Evidence-based practice.**

Nurses (as well as doctors) find it difficult to cope with the explosion of clinical knowledge, and apply the most appropriate research findings to patient care. The clinical care pathways may be used as a vehicle to implement research findings into practice. This will be discussed further in the concluding chapter.

### **11.6. Conclusions.**

The intervention has been effective in improving the assessment records of patients with chest pain, and may also have made the assessment itself more structured, enabling the nurse to identify areas that require nursing interventions. This may explain the changes observed in some of the clinical indicators. However, the study has certain limitations. For instance, the relatively short trial period of implementation of the change may not have been long enough to make sustainable changes in the structures and processes of care. It was also apparent to the researcher that the clinical staff were not fully committed to the change process and this may have had some effects in the change process.

To examine whether it was the intervention in the form of the introduction of the care pathway which was responsible for the improvement in assessment of patients, a follow up study was carried out two months after the completion of the trial period of using the care pathway. The next chapter examines the findings of that study.

**CHAPTER TWELVE. REDUCING OMISSIONS AND INADEQUACIES  
IN THE ASSESSMENT OF PATIENTS WITH CHEST PAIN: A  
FOLLOW-UP STUDY.**

**12.1 Introduction.**

The study reported in chapter 11 concerning the implementation of a critical care pathway for patients admitted with chest pain (angina/myocardial infarction) was for a trial period of three months. The findings in chapter 11 suggest that the intervention was effective in a number of ways. For instance, there was a marked improvement in the assessment records of patients with chest pain, with all the relevant criteria relating to myocardial infarction and angina thoroughly assessed. There were also significant changes in nursing behaviours and patients' variables. In general, nurses appeared to be more aware of the patients' needs, hence responding promptly to them. Patients had better knowledge of their condition and treatment, and also reported less pain and anxiety. In conjunction with the patient assessment, these nursing and patients' variables were found to lead to increased patients' satisfaction with their care. Using a path analysis, it was demonstrated that compliance with patient assessment protocol had a direct effect as well as indirect effects on satisfaction with care outcomes. The Coronary Care Unit (CCU) and the three medical wards reverted back to the conventional system of documentation and care when the trial period was over. Some of the staff on the medical wards wanted to continue with it, but since the staff on the Coronary Care Unit were very negative towards this system of care, it was not possible to continue with the care pathway, the reason being the majority of patients with acute chest pain are admitted to the CCU first and the care pathway is a system that has to be used from admission to discharge.

Thus, the main aim of this study is to monitor the effect of the reversal to the conventional system of care which in turn may give further information on the efficacy of the intervention.

## **12.2 Method.**

### **12.2.1 Sample.**

A sample of 30 patients admitted with chest pain (angina/myocardial infarction) was selected for this study. The patients were nursed on three medical wards and were initially transferred from the CCU.

### **12.2.2 Procedures.**

The same inclusion and exclusion criteria concerning the baseline group in the study reported in chapter 11 were applied to this study. Data were collected over a period of one month from patients with chest pain after they were transferred to the medical wards from the CCU. The data collection took place two months after the completion of the trial period involving the use of the critical care pathway. The data relating to the audit of the patient assessment records were collected from the conventional records (i.e. the records that were in place before the implementation of the care pathway).

### **12.2.3 Questionnaires.**

The same questionnaires as in the study reported in chapter 11 were used. These included :-

- a) An audit questionnaire to assess the quality of the assessment records of patients with chest pain.
- b) A questionnaire consisting of ten questions to test patients' knowledge of their chest pain and its management.
- c) A short form McGill Pain Questionnaire (SF-MPQ).
- d) The Beck Anxiety Inventory (BAI) scale.



e)The Newcastle Satisfaction with Nursing Care Scales to evaluate the patients experience of their nursing care and their satisfaction level.

All the questionnaires are found in appendix 7.

### **12.3 Results.**

All 30 patients selected for this study completed all the stages of the study. The data were examined for accuracy of entry and missing values. There were no missing data.

#### **12.3.1 Comparisons between the baseline, experimental and follow-up groups on demographic data.**

The three groups were compared to see whether there was any significant difference in the demographic data. As table 12.1 shows, the demographic data in all three groups are largely similar, with the exception of length of stay in hospital. The follow-up group had stayed slightly longer in hospital. However, this was unlikely to have a major impact on the results as hospital stay for patients with chest pain in the three medical wards were usually more related to delay in having specialised cardiac investigations than to their clinical conditions.

**Table 12.1. Comparison of the demographic data between the baseline, experimental and follow-up group.**

Demographics	Baseline group % (number)	Experimental group % (number)	Follow-up group % (number)	Chi-square value	Df	P value
<b>Age</b>						
35-45	1.7 (1)	3.3 (2)	3.3 (1)			
46-55	16.7 (10)	23.3 (14)	6.7 (2)			
56-65	28.3 (17)	30 (18)	30 (9)			
66-75	36.7 (22)	30 (18)	30 (9)			
76-85	16.7 (10)	13.3 (8)	30 (9)			
				7.3	8, 142	NS
<b>Gender</b>						
Male	68 (41)	65 (39)	66.7 (20)			
Female	31.7 (19)	35 (31)	33.3 (10)			
				.15	2, 148	NS
<b>Education level</b>						
Basic (up to 16)	93.3 (56)	86.7 (52)	93.3 (28)			
Further ( 17+)	6.7 (4)	13.3 (8)	6.7 (2)			
				1.9	2, 148	NS
<b>Diagnosis</b>						
Myocardial infarction	35 (21)	38.3 (23)	36.7 (11)			
Angina	65 (39)	61.7 (37)	63.3 (19)			
				7.1	2, 148	NS
<b>Length of stay</b>						
1-5 days	81.7 (49)	75 (45)	63.3 (19)			
6-10 days	8.3 (5)	23.3 (14)	33.3 (10)			
11-15 days	10 (6)	1.7 (1)	3.3 (1)			
				16.4	4, 146	.05*

\* p < .05 NS= non-significant

There was no significant difference in the distribution of the patients between the three medical wards in the three groups. The results are shown in table 12.2.

**Table 12.2. Distribution of the patients between the three medical wards.**

Wards	Baseline group % (number)	Experimental group % (number)	Follow-up group % (number)	Chi-square value	Df	P value
Medical ward 1	31.7 (19)	38.3 (24)	30.0 (9)	3.21	4, 146	.52 (NS)
Medical ward 2	38.3 (23)	25.0 (15)	40.0 (12)			
Medical ward 3	30.0 (18)	36.7 (21)	30.0 (9)			

**12.3.2. Quality of assessment of patients with angina/myocardial infarction.**

For this follow-up group, the audit of the assessment record revealed inadequate assessment of the patients and a number of omissions were identified. These will be explained below. There were many similarities between the results obtained in this follow-up group and the baseline group. In contrast, the compliance to the assessment protocol in the experimental group was markedly different to that of the baseline and follow-up group. The results are shown in Table 12.3.

**Table 12.3. Comparison of 'fully met' compliance between the three groups.**

<b>Criteria</b>	<b>Baseline group % fully met</b>	<b>Experimental group % fully met</b>	<b>Follow-up group % fully met</b>
<b>History of development of chest pain</b>			
Presenting complaint recorded	51.7	88.3	46.7
Past medical history recorded	81.7	100	83.3
Current medication recorded	41.7	100	70
History of chest pain recorded	23.3	96.7	20
Description of pain recorded	18.3	100	10
Intensity of pain recorded	10	98.3	0
<b>Physiological and physical observations</b>			
Association of pain with other signs/symptoms	21.7	98.3	20
Vital signs recorded	53.3	95	90
ECG recorded	16.7	56.7	6.7
Assessment of haemodynamic effect recorded	15	88.5	16.7
Weight recorded	16.7	48.3	6.7
<b>Response/knowledge</b>			
Psychological reaction to chest pain recorded	1.7	66.7	0
Knowledge level of patient assessed	8.3	65	10
<b>Lifestyle</b>			
Smoking pattern recorded	58.3	98.3	56.7
Dietary pattern recorded	46.7	98.3	36.7
Drinking pattern recorded	20	88.3	10

#### **12.3.2.1 Areas of deficiencies.**

The three groups were compared on their level of 'fully met' compliance with the criteria relating to the assessment of patients with chest pain. The results, displayed in table 12.3, showed only minor differences between the baseline and follow-up group, but marked differences between these two groups and the experimental group. The differences in the sub-scales were as follows:

#### **12.3.2.2 History of development of pain.**

The experimental group 'fully met' the six criteria relating to the development of chest pain in over 88 % of cases. In comparison, the baseline and follow-up group did particularly poorly on 5 of the six criteria. The compliance level between the baseline and follow-up groups are largely similar, except in the recording of current medication . The results are shown in table 12.3.

#### **12.3.2.3 Physiological and physical observations.**

The compliance rate between the baseline and follow-up groups was broadly similar in 4 of the five criteria relating to physiological and physical observations. They differed mainly on the recording of vital signs where the baseline group achieved 70 % compliance and the follow-up group achieved 90 % compliance. The compliance rate in the experimental group was superior to the two groups in all 5 criteria.

#### **12.3.2.4. Knowledge and psychological response**

The patients' psychological state and their knowledge of their condition were mostly omitted in the assessment records of both the baseline and the follow-up group. But the assessment of these two criteria were recorded in over 65 % of the notes of the patients in the experimental group.

**12.3.2.5. Lifestyle**

Assessment of lifestyle habits was recorded in over 88 % of the notes of the experimental group; but in both the baseline group and follow-up group, the recording of these three lifestyle criteria was patchy, achieving less than 60 % for smoking, diet and drinking.

**12.3.3. Comparison of patient assessment (audit score) of the three groups.**

Using the scoring criteria of 1 point for 'not met', two points for 'partially met' and three points for 'fully met', the baseline group obtained a mean audit score of 29.7 (out of 48), the experimental group obtained 45.2 (out of 48) and the follow up group 29.1. The results are displayed in table 12.4.

**Table 12.4 Comparison of patient assessment (audit score) between the baseline, experimental and follow-up groups.**

Criteria (sub scale)	Baseline mean (Sd)	Experimental mean (Sd)	Follow-up mean (Sd)	Df	F-ratio
History of development of chest pain	12.4 (1.8)	17.9 (.4)	12.2 (2.3)	1,149	22.33**
Physiological/physical observations.	8.6 (2.1)	13.3 (1.3)	8.8 (1.7)	1,149	13.24**
Response/knowledge	2.7 (.9)	5.3 (.9)	2.6 (.8)	1,149	16.42**
Lifestyle	6.0 (1.9)	8.7 (.9)	5.5 (1.9)	1,149	58.5**
Total audit score	29.7 (5.0)	45.2 (3.0)	29.1 (4.8)	1,149	36.55**

\*\* p < .001

As table 12.4 shows, the mean scores on the subscales as well as the total audit score for the follow-up group are broadly similar to those obtained by the baseline group, but different to the experimental group. The results also show that there is a significant difference between the three groups.

#### **12.3.3.1. Paired group comparisons of audit scores and post-hoc analysis (Scheffe test).**

The F ratio described in the ANOVA in the previous section only indicates that there is a significant difference between the means of the three groups. To find out where the difference lies and to confirm whether the difference is significant or not, paired group comparisons and Scheffe test were carried out. The Scheffe test has tougher significance level to take into account of the greater likelihood of finding significant results when doing several comparisons (Cramer, 1994; Bryman & Cramer, 1990). Table 12.5 shows the results of the paired comparisons and the Scheffe test.

**Table 12.5. Paired group comparisons of audit scores between baseline and experimental, baseline and follow-up and experimental and follow-up and post-hoc analyses (Scheffe test).**

Comparisons	Criteria	Baseline Mean (sd)	Experimental Mean (sd)	Df	F-value	Scheffe * = p sig.
Baseline v/s experimental	History of development of chest pain.	12.4 (1.8)	17.9 (0.4)	1,118	51.0***	*
	Physiological/physical observations	8.6 (2.1)	13.3 (1.3)	1,118	22.5***	*
	Response/knowledge	2.7 (0.9)	5.3 (0.9)	1,118	25.4***	*
	Lifestyle	6.0 (1.9)	8.7 (0.9)	1,118	95.8***	*
	<b>Total audit score</b>	29.7 (5.0)	45.2 (3.0)	1,118	59.4***	*
Comparisons	Criteria	Baseline	Follow-up	Df	F-ratio	Scheffe
Baseline v/s follow-up	History of development of chest pain	12.4 (1.8)	12.2 (2.3)	1,89	.20	NS
	Physiological/physical observations	8.6 (2.1)	8.8 (1.7)	1,89	.36	NS
	Response/knowledge	2.7 (0.9)	2.6 (0.8)	1,89	.18	NS
	Lifestyle	6.0 (1.9)	5.5 (1.9)	1,89	1.1	NS
	<b>Total audit score</b>	29.7 (5.0)	29.1 (4.8)	1,89	.04	NS
Comparisons	Criteria	Experimental	Follow-up	Df	F-ratio	Scheffe
Experimental v/s follow-up	History of development of chest pain	17.9 (0.4)	12.2 (2.3)	1,89	34.1***	*
	Physiological/physical observations	13.3 (1.3)	8.8 (1.7)	1,89	20.0***	*
	Lifestyle	8.7 (0.9)	5.5 (1.9)	1,89	11.8***	*
	Response/knowledge	5.3 (0.9)	2.6 (0.8)	1,89	20.3***	*
	<b>Total audit score</b>	45.2 (3.0)	29.1 (4.8)	1,89	48.2***	*

\* p < .05 \*\* P < .01 \*\*\* p < .0001

The results indicate that the means of the baseline and follow-up group do not differ from each other, but they both differ significantly from the mean of the experimental group. This confirms that the intervention (i.e. the implementation of the care pathway) did have a significant impact on patient assessment (as reflected by the audit scores).



**12.3.4. Evaluation of differences in the clinical indicators between the three groups.**

To test whether there are any differences in selected patients' variables (clinical indicators) between the three groups, one-way ANOVA was carried out to analyse data sets on the selected clinical indicators. The results are shown in table 12.6.

**Table 12.6. Comparison of the three groups on physiological indicators, cognitive indicators and satisfaction with care outcomes. Results of one-way ANOVA.**

Patients' variables	Baseline mean (Sd)	Experimental mean (Sd)	Follow-up mean (Sd)	F-value	Df	P value
<b>Physiological indicators</b>						
McGill pain scores (score 0-45)	12.2 (6.2)	9.2 (3.7)	8.7 (4.8)	7.14	2,147	.0011**
Pain level (scale 1-5)	2.9 (1.0)	2.9 (0.9)	2.9 (1)	.024	2,147	.97
<b>Cognitive indicators</b>						
Anxiety scores (BAI score 0-63)	16.9 (9.0)	13.8 (7.5)	14.6 ( 11)	1.80	2,147	.17
Knowledge (score 0-10)	7.3 (2.1)	8.6 (2.0)	7.4 (1.7)	6.1	2,147	.0029**
<b>Satisfaction with care</b>						
Experience of care (score 0-100)	85.7 (0.76)	93.6 (5.6)	91 (4.3)	23.5	2,147	.0000***
Satisfaction with care (score 0-100)	82.2 (12.4)	91.9 (9.4)	88 (5.6)	13.9	2,147	.0000***

\*\* p <.01      \*\*\* P < .0001

Table 12.6. shows the means and standard deviations of pain scores, pain level, anxiety scores, knowledge scores, experience of nursing care and satisfaction

with nursing care. The mean score for pain level did not differ in the three groups. However, the experimental group obtained higher mean scores on all the other clinical indicators. With the exception of BAI anxiety scores, these differences were found to be statistically significant by a one-way ANOVA .

To ascertain where the difference lies, paired group comparisons of the baseline and experimental, baseline and follow-up, and experimental and follow-up as well as post-hoc test on selected patients' clinical variables were carried out. This is shown in table 12.7.

**Table 12.7. Paired group comparisons between baseline and experimental, baseline and follow-up and experimental and follow-up on physiological indicators, cognitive indicators and satisfaction with care outcomes and post-hoc analyses.**

Comparisons	Patients' variables	Baseline Mean (sd)	Experimental Mean (sd)	Df	F-value	Scheffe * = p sig.
Baseline v/s experimental	<b>Physiological indicators</b>					
	McGill Pain scores (0-45)	12.2 (6.2)	9.2 (3.7)	1,118	10.5**	*
	Pain level (1-5)	2.9 (1.0)	2.9 (0.9)	1,118	.009	NS
	<b>Cognitive indicators</b>					
	BAI Anxiety scores(0-63)	16.9 (9.0)	13.8 (7.5)	1,118	3.9*	NS
	Knowledge (0-10)	7.3 (2.1)	8.6 (2.0)	1,118	11.6**	*
Satisfaction with care	<b>Satisfaction with care</b>					
	Experience of care (0-100)	85.7 (0.8)	93.6 (5.6)	1,118	40.1***	*
	Satisfaction with care (0-100)	82.2 (12.4)	91.9 (9.4)	1,118	23.7***	*
Comparisons	Patients' variables	Baseline	Follow-up	Df	P-value	Scheffe
Baseline v/s follow-up	<b>Physiological Indicators.</b>					
	McGill pain scores (0-45)	12.2 (6.2)	8.7 (4.8)	1,89	7.1**	*
	Pain level (1-5)	2.9 (1.0)	2.9 (1.0)	1,89	.05	NS
	<b>Cognitive indicators</b>					
	BAI Anxiety scores(0-63)	16.9 (9.0)	14.6 (1.1)	1,89	1.2	NS
	Knowledge (0-10)	7.3 (2.1)	7.4 (1.7)	1,89	.02	NS
Satisfaction with care	<b>Satisfaction with care</b>					
	Experience of care (0-100)	85.7 (0.8)	91 (4.3)	1,89	12.4***	*
	Satisfaction with care (0-100)	82.2 (12.4)	88 (5.6)	1,89	5.8*	*
Comparisons	Patients' variables	Experimental	Follow-up	Df	P-value	Scheffe
Experimental v/s follow-up	<b>Physiological indicators.</b>					
	McGill Pain Score (0-45)	9.2 (3.7)	8.7 (4.8)	1,89	.24	NS
	Pain level (1-5)	2.9 (0.9)	2.9 (1.0)	1,89	.02	NS
	<b>Cognitive indicators</b>					
	BAI Anxiety score (0-63)	13.8 (7.5)	14.6 (1.1)	1,89	.10	NS
	Knowledge (0-10)	8.6 (2.0)	7.4 (1.7)	1,89	8.6**	*
Satisfaction with care	<b>Satisfaction with care</b>					
	Experience of care (0-100)	93.6 (5.6)	91 (4.3)	1,89	4.4*	NS
	Satisfaction with care( 0-100)	91.9 (9.4)	88 (5.6)	1,89	4.7*	NS

\* p < .05 \*\* p < .01 \*\*\* p < .0001

The results indicate that patient knowledge of their condition and treatment is significantly higher in the experimental group than the baseline and follow-up group and that there was no difference in knowledge between the baseline and follow-up group. Patients in the experimental and follow-up groups recorded less pain (McGill pain score) and were also more satisfied with their care than patients in the baseline group. The results show that without the intervention, the results (particularly patients' knowledge) returned to their previous level.

#### **12.3.5. Evaluation of nursing behaviours in the baseline, experimental and follow-up groups.**

The results relating to nursing behaviours in the three groups are displayed in table 12.8. The results indicate that nursing behaviours in relation to activities such as monitoring of arrhythmias, planned activity regime for patients, prompt responses to patients' pain, relief of pain, and improved control of chest pain were more commonly recorded in the experimental group than in the baseline and follow-up group. The overall difference was found to be highly significant in a one-way ANOVA, as shown in table 12.8.

**Table 12.8. Comparison of nurses' behaviours between the baseline, experimental and follow-up group.**

Nurses' variables	Baseline mean (Sd)	Experimental mean (Sd)	Follow-up mean (Sd)	F-value	Df	P-value
Monitoring of arrhythmia (scale 1-3)	1.6 (0.8)	2.3 (0.9)	1.3 (.7)	17.2	2,147	.0000
Planned activity regime (scale 1-3)	1.5 (0.7)	2.9 (0.01)	1.2 (.5)	24.8	2,147	.0000
Prompt response to pain	4.4 (0.7)	4.9 (0.4)	4.7 (.5)	7.9	2,147	.0005
Relief of pain (scale 1-3)	2.0 (0.9)	2.9 (0.5)	1.4 (.7)	46.7	2,147	.0000
Good pain control (scale 1-5)	4.2 (0.8)	4.9 (0.4)	4.7 (.5)	18.3	2,147	.0000

\*\* p < .01 \*\*\* p < .0001

When data sets involving the baseline and experimental group, baseline and follow-up and experimental and follow-up group were compared using a one-way ANOVA and post hoc test (Scheffe), the difference between the baseline and experimental group on all the selected nursing behaviours was found to remain significant. However, the results obtained between the baseline and follow-up and experimental and follow-up were more variable. These are shown in table 12.9.

**Table 12.9. Paired group comparisons between baseline and experimental, baseline and follow-up and experimental and follow-up and post-hoc analyses.**

Comparisons	Nursing behaviours	Baseline Mean (sd)	Experimental Mean (sd)	Df	F-value	Scheffe *=p sig.
Baseline v/s experimental	Monitoring of arrhythmia (scale 1-3)	1.6 (0.8)	2.3 (0.9)	1,118	17.3***	*
	Planned activity regime (Scale 1-3)	1.5 (0.7)	2.9 (0.01)	1,118	30.9***	*
	Prompt response to pain (scale 1-5)	4.4 (0.7)	4.9 (0.4)	1,118	15.7***	*
	Relief of pain (scale 1-3)	2.0 (0.9)	2.9 (0.5)	1,118	44.1***	*
	Good pain control (scale 1-5)	4.2 (0.8)	4.9 (0.4)	1,118	32.5***	*
Comparisons	Nursing behaviours	Baseline	Follow-up	Df	F-value	Scheffe
Baseline v/s follow-up	Monitoring of arrhythmia (scale 1-3)	1.6 (0.8)	1.3 (0.7)	1,89	3.9*	NS
	Planned activity regime (scale 1-3)	1.5 (0.7)	1.2 (0.5)	1,89	4.1*	*
	Prompt response to pain (scale 1-5)	4.4 (0.7)	4.7 (0.5)	1,89	4.2*	NS
	Relief of pain (scale 1-3)	2.0 (0.9)	1.4 (0.7)	1,89	10.8*	*
	Good pain control (scale 1-5)	4.2 (0.8)	4.7 (0.5)	1,89	10.8**	*
Comparisons	Nursing behaviours	Experimental	Follow-up	Df	F-value	Scheffe
Experimental v/s follow-up	Monitoring of arrhythmia (scale 1-3)	2.3 (0.9)	1.3 (0.7)	1,89	28.9***	*
	Planned activity regime (scale 1-3)	2.9 (0.01)	1.2 (0.5)	1,89	72.4***	*
	Prompt response to pain (scale 1-5)	4.9 (0.4)	4.7 (0.5)	1,89	1.01	NS
	Relief of pain (scale 1-3)	2.9 (0.5)	1.4 (0.7)	1,89	12.5***	*
	Good pain control (scale 1-5)	4.9 (0.4)	4.7 (0.5)	1,89	1.7	NS

\* p < .05 \*\* p < .01 \*\*\* p < .0001

Overall, the results in table 12.9 indicate that there was an improvement in nursing behaviours following the implementation of the new patient assessment protocol (care pathway), but two of these improvements (i.e. prompt response to pain and good pain control) were maintained in the follow-up group. The mean for monitoring of arrhythmia, planned activity and relief of pain was lower in the follow-up group than the baseline group, again indicating that the reversal to the conventional system led to a collapse of the standard achieved in the experimental group.

The comparisons between the baseline and follow-up groups were mostly non-significant, suggesting that the intervention had made a difference. They could have been significant with a bigger follow-up sample, but the similarity of the means suggests otherwise. For the experimental versus the follow-up group, there were significant differences between a number of key variables even with the small sample.

#### **12.4. Discussion.**

Overall, the findings indicate that there was a substantial deterioration in the quality of the assessment records of patients with chest pain following the return to the use of the conventional system of documentation. This provides powerful evidence of the effectiveness of the critical care pathway in improving assessment of patients with angina and myocardial infarction. There were also significant differences in patients' knowledge of their condition and treatment between the experimental group and the follow-up group whereas patients' knowledge were the same in both the baseline and experimental group. Nursing behaviours relating to the monitoring of arrhythmia, planning patient's activity and relief of pain were markedly superior in the experimental group compared to that of the follow-up group. These indicate that the benefits accrued with the use of the care pathway in the experimental group were lost when the wards reverted

back to using the conventional system of documentation and care for patients with chest pain.

#### **12.4.1. The quality of the assessment records in the follow-up group.**

The assessment of patients with chest pain in the follow-up group was superficial and contained a number of omissions and inadequate recording of assessment data. Almost all the omissions and inadequacies observed in the assessment records of patients in the follow-up group were virtually similar to those found in the assessment records of the baseline group. These provide strong evidence that the intervention described in chapter 11 concerning the implementation of the critical care pathway was an effective tool in the improvement of the assessment records of patients with chest pain and reducing omissions.

#### **12.4.2. Effects of intervention on specific outcomes**

The follow-up study provides evidence that when the ward staff reverted to using the conventional system, the gains in clinical outcomes achieved with the care pathway system were reduced, and in most cases reverted back to similar level or less than that obtained in the baseline group.

##### **12.4.2.1. Physiological outcomes.**

The results related to level of pain felt by the patients were less conclusive. For instance, the McGill pain scores were slightly lower in the follow up group compared to the baseline and experimental groups whereas the pain level (pain analogue) was the same across the three groups. Since there were no significant demographic differences between the three groups, it is then possible that the smaller sample in the control group may have skewed the results on the pain scores.



#### **12.4.2.2. Anxiety and knowledge of condition.**

The BAI anxiety scores were similar across the three groups, but the knowledge level in the control group reverted to the pre-intervention level, indicating strongly positive effects of the intervention on improving patients' knowledge of their condition and treatment.

#### **12.4.2.3. Experience of nursing care and satisfaction scores.**

In the follow up group, there was a slight fall in the experience of nursing care and the satisfaction with care scores compared to that of the experimental group, although this was not statistically significant. This might indicate that the patients responded more positively with the care pathway system where their care was well structured and the planned interventions were more targeted to their actual needs and problems than with the conventional system. There was also no significant difference between the experimental group and follow-up groups on prompt response to chest pain and good control of chest pain. As these two variables were found to be positively associated with satisfaction with care outcomes in the study reported in chapter 11, this might explain why both experimental group and follow-group were different to the baseline group on satisfaction with care outcomes. This would also support the conclusions reached in the previous chapter relating to the fact that satisfaction with care outcomes are influenced by the interactions of a number of factors and not by single factors.

### **12.5. Conclusions**

The follow-up study provides conclusive evidence that the assessment records of patients with chest pain could be improved and omissions reduced if the structures and processes of care were changed and a systematic system such as the care pathway was used. It also strongly suggests that the improved care plan inherent with the use of the care pathway had a positive impact on patients' care and nursing behaviours. The increased in patients' knowledge in the experimental

group provides strong evidence that when care is systematically and comprehensively planned and delivered using a specific protocol, patients are more likely to be given more accurate and pertinent information about their condition and treatment. This may have a cascading effect on their response to their care and rehabilitation regime as well as on their experience and satisfaction with their care.

However, the lack of significant differences between the experimental and follow-up groups on some of the other variables under investigation (e.g. prompt response, good pain control, and satisfaction with care outcomes) may suggest the possible influence of some untested variables on these variables. Moreover, when introducing changes, the possibility of Hawthorne effect must also be taken into account. For instance, although the wards reverted to the conventional system of assessment, some of the nurses may still have responded to the presence of the researcher and to the fact that data was still being collected by continuing to use some approaches to care inherent with the care pathway approach.

Thus, the use of critical care pathways can be an effective and valuable system approach in care improvement strategies, and may help to minimise the error-producing conditions which, in previous chapters, were found to be prevalent in nursing practice.

**CHAPTER THIRTEEN: DISCUSSION.**

This thesis has been concerned with the scientific study of nursing errors, their impact on the quality and safety of nursing care, and ways of reducing their incidence. The findings indicate that there is a substantial problem of errors in the delivery of nursing and medical care, but there is little concerted attempt by the clinicians to understand and tackle the chain of events that leads to errors and adverse events. It is clear that efforts must be directed at reducing errors in clinical care; and it is suggested that the scope of audit must be expanded to include the investigation of errors and adverse incidents as well as the development of sound strategies to make clinical care safer.

Although there is a strong professional ethos regarding the maintenance of safety and quality in clinical care, yet clinicians seldom collect or analyse data on the incidence of errors and adverse incidents. Evidence from the critical reviews of the literature and the empirical studies shows a failure by staff to fully appreciate the magnitude of the problem of errors in clinical practice and their implications to the quality and safety of care. As a result, the types of measures taken to deal with clinical errors and adverse events may be flawed and may not yield the desired results.

However, it is becoming increasingly important to change attitudes towards clinical errors and their management. Indeed, the rapid technological advance and other changes in the clinical field have increased the opportunities for errors as well as their impact on patients. There has also been a shift of patients' attitude towards health professionals and their treatment. They are better informed and have much more to say about how they are treated. They are also more inclined to seek redress through litigation or official complaints if they feel that they have sustained iatrogenic injuries or distress/discomfort through substandard care. In fact, medical negligence compensation claims now cost the NHS more than 125

million every year, with several made in excess of one million (The Times, 1998). These new trends suggest the need for more rigorous approach to evaluate the extent of the problem of clinical errors and to institute effective measures to tackle them.

The importance of learning from errors in order to prevent them is widely recognised in various fields (Reason, 1990). However, error management in the clinical field is still in its infancy, particularly when compared to aviation. Safety in aviation has been institutionalised and the adherence of airlines and pilots to required safety standards is closely monitored (Leape, 1994). In medicine and nursing, although errors are not necessarily ignored and audit is widely used, preventive activities are focused on incidents and individuals and root causes or the underlying system failures are rarely sought (Leape, 1994). Ohlsson (1996) argues that to learn from errors one should be able not only to detect them but also to understand their antecedents.

### **13.1. Overview of the findings of this thesis.**

#### **13.1.1. Findings from the literature review.**

In recent years, there have been a surge of interest in medical and anaesthetic errors. This has partly been triggered by the results of large scale studies such as the Confidential Enquiries, the Harvard Medical Practice Study (1991) and the Quality in Australian Health Care Study (1995) which reported a high incidence of errors and adverse events in medicine and also the spate of litigation for medical negligence and iatrogenic injuries. The growth of clinical audit has also raised awareness of quality and safety issues in clinical practice. By contrast, the investigation of errors in nursing are limited only to the study of medication errors, and little is known about the range and types of errors that nurses make.

However, much is known now on the nature and aetiology of errors in other systems, particularly as a result of enquiries relating to a number of catastrophic incidents such as Three Mile Island, Heysel Stadium, the Herald of Free Enterprise ferry disaster, Chernobyl and Bhopal. Analysis of these accidents revealed that they are often the end result of a chain of events set in motion by a faulty system. These system features either trigger errors or make them difficult to detect. Thus, in almost all cases, latent or organisational factors rather than particular individuals at the sharp end played a crucial role in their occurrences.

Reason (1990) has developed an organisational accident model to be used for the analysis of accidents and adverse events. This model incorporates the complete chain of events that leads to an accident in order to locate the source of the error and to identify the most effective strategies to prevent its future occurrence. However, clinicians rarely use in-depth analysis of errors of the type offered by the model, principally because they believe that errors should not occur in clinical practice in the first place and through a lack of appreciation of the extent of the problem. For instance, although more people sustained injuries or die from clinical intervention than from aviation, they do not have the same impact on the consciousness of health professionals or the general public because they happen one at a time compared to an air crash where hundreds of people may die in one crash (Leape, 1994). Health professionals also have an ostrich approach to clinical errors and adverse events, preferring to think that they do not exist or are minor problems perpetrated mostly by negligent or incompetent individuals.

Thus, clinicians responses to errors are both complex and ambivalent. Attribution theory can provide some insight into the behavioural responses of clinicians to their errors. Attribution research suggests that people react to a negative event by giving an external cause to it (i.e. blaming the environment). Yet, if another person has made the error, an internal attribution (i.e. blaming the person) is

made regarding its cause. These reactions have an impact on the way people cope with their errors or deal with hazards at work. External attribution has been found to lead to negative coping whereas internal attribution leads to superior coping and better management of errors (Mitchell & Wood, 1980). Thus, nurses will be more likely to make changes in their practice in the aftermath of an error if they accept responsibility for it than if they deny their role in its occurrence (Wu et al, 1991).

### **13.1.2. Findings of empirical studies.**

#### **13.1.2.1. Types of errors made and nurses' responses to them.**

The study in chapter six revealed that different types of errors were made by nurses, errors of assessment and planning, intervention, evaluation and communication being the most common types. These errors were predominantly slips and lapses. These may suggest that the nurses may be working under conditions of stress and work overload (Reason, 1990). In most cases, the errors that nurses made did affect the patients adversely. Nurses also reported a range of psychological reactions in response to their errors. After the initial feelings of guilt, inadequacy and anger, nurses used a number of coping responses to address this problem. Accepting responsibility and planful problem solving were particularly found to be associated with constructive changes in their practice to make their care safer. However, it was also found that nurses may suffer from a loss of confidence in the aftermath of the error; and this together with the perceived lack of support from their superiors may affect their performance. Thus, the overall findings of the study suggest that nurses should be encouraged to accept responsibility for their error within a supportive framework. Wu et al's (1991) obtained a similar findings in their study of house officers' mistakes.

**13.1.2.2. Frequency of errors of omissions in the assessment of patients with chest pain.**

A questionnaire was then developed to evaluate the quality of nursing assessment records of patients with chest pain (angina/myocardial infarction) and incidence of errors of omissions. An audit of the assessment records of these patients revealed significant omissions and inadequacies. Key information about the patients' condition which are important in identifying signs of complications and indicating types of interventions which might be required were missing from the nursing records. There was also no evidence of any ongoing assessment after the initial assessment of the cardiac pain. Information on lifestyles which would form the basis of the patients' rehabilitation regime was particularly poorly recorded. The overall findings of this study would suggest that important aspects of care may not be given because of the inadequate assessment and possible failure to identify specific problems.

**13.1.2.3. Perceptions of causes of omissions in the assessment of patients with chest pain.**

However, in a study (reported in chapter 8) investigating the nurses' perception of the causes of omissions, there was evidence of a general misperception of risk by the staff, perceiving errors of omission in the assessment of patients with chest pain to be less common than was the case. There was also evidence that nurses did not perceive omissions and inadequacies in assessment and care as being the same as more "defined" errors (e.g. a medication error), indicating that there was a problem of definition and interpretation regarding the nature of nursing errors. This was reflected in their differential responses to omissions in assessment of patients (chapter 8) and "errors" (chapter 10). For instance, they predominantly attributed the causes of the omissions in assessment to environmental factors (external causal attributions) whereas the causes of a clearly more defined hypothetical error relating to a failure to follow a written instruction about the

post-operative care of a surgical patient was attributed to internal causal factors (e.g. lack of experience, ability). As internal responses are associated with the acceptance of responsibility for an incident (Dejoy, 1990, Wu et al, 1991), the findings would suggest that they may be less inclined to make changes to their practice in incidence of omissions in the assessment and care of patients than when a more "defined" error is made. It also indicates a failure to appreciate the conditions and circumstances that are likely to predispose to active failures (Reason, 1990). In fact, there are different ways in which the causes of omissions reported by the nurses (chapter 8) may lead to more serious errors. For instance, "too many nurses being involved in assessment" may mean that none of the nurses was taking responsibility for the overall assessment of the patients. They may rely unduly on each other to complete the assessment. There may also be some communication failures because of the array of nurses who were involved in the assessment. As a result, certain aspects of patient assessment may not take place, potentially missing out some important problems. "Lack of time" may not only affect the detailed assessment of patients but may also include an element of inaccuracies in the assessment. This may make it difficult for the nurses to identify the more subtle or potential problems, hence failing to take appropriate measures against potentially serious or life threatening situations. Inadequacies and omissions in the assessment and care of patients may also create error-producing conditions (Reason, 1990) which could then lead to more serious errors and adverse events given a change in circumstances such as acute shortage of staff or when staff who are not familiar with the ward or the specialty are drafted in to help.

#### **13.1.2.4. Clinical knowledge and the assessment of patients with chest pain.**

Knowledge, experience and skills are all important ingredients for quality and safe care, reflected in the long course that nurses have to undergo before qualifying to practice as nurses and the subsequent updating that they are



required to achieve to maintain their registration. Surprisingly, very few nurses in the study reported in chapter 8 considered lack of knowledge/skills/experience to be an important factor in their omissions. Nurses' clinical knowledge was therefore tested to ascertain whether there was a gap in their knowledge which they may not be aware of. The findings indicate that nurses' recall of items of knowledge relating to chest pain (angina/myocardial infarction) was less than adequate, achieving only about 50 % of the expected score. Yet when the appropriate items of knowledge were presented to them, they identified all of them as relevant or very relevant, indicating that their recognition of relevant items of information was superior to their recall. This suggests that they did have the knowledge, but the knowledge was "inert" (Cook and Woods, 1991; Bransford et al., 1986), i.e. they could not access it when it is required. As a result, they may fail to assess important aspects of the patients' conditions. This suggests the need for providing guidelines for care which will act as "prompts" or memory cues to the nurses to retrieve knowledge which is otherwise inaccessible.

#### **13.1.2.5. Reducing omissions in the assessment of patients with chest pain and improving care.**

The findings of the studies reported in chapters 6 to 10 indicated that various types of errors were made in the delivery of nursing care and that nurses' response to these errors varied according to the types of errors made. On the whole, the causes of "well-defined" errors were attributed mostly to internal factors whereas the causes of errors of omissions in the assessment of patients with chest pain were attributed overwhelmingly to external factors. On the basis of these findings, a system approach in the form of a critical care pathway was implemented to address the system failures (e.g. poor record keeping system, lack of time, failures in communication, lack of continuity in care) which were identified as playing a major role in the production of errors of omissions in the assessment of patients with chest pain. Care pathway or clinical guideline would

also be expected to tackle some internal causes of omissions such as lack of knowledge/experience of chest pain as it provides an easy to follow guide and "prompts" for the assessment and care of these patients for the whole duration of their stay in hospital. The intervention was found to significantly reduce omissions in the assessment of patients. All specific aspects relating to chest pain were comprehensively assessed. There were also indications that the implementation and use of the care pathway had an exponential effects on various aspects of care, including both processes and outcome of care. For instance, patients in the experimental group had superior knowledge of their condition and treatment and experienced less pain and anxiety than those in the baseline group. Nurses also responded promptly to the needs of patients in experimental group. A path analysis indicated that the new form of patient assessment and the associated changes in nursing behaviours and patients' variables had individual and combined effects on satisfaction with care outcomes. After reversal to the conventional (former) system of documentation and care, most of the gains achieved in the experimental group were lost, confirming that the intervention did have a positive effect in the assessment and care of patients with chest pain.

### **13.2. Issues raised from the findings of this thesis.**

Although this thesis has been primarily concerned with omissions and inadequacies in the assessment of patients with chest pain, the findings have highlighted a number of important general issues relating to safety and quality in nursing care and methods that are likely to reduce errors in clinical care.

#### **13.2.1. Clinical knowledge, skills, and performance.**

Nursing care is becoming more complex, with greater knowledge and skills required of nurses. Recent changes in nurse education such as the replacement of the certificate course by an all-diploma programme have been introduced to

circumvent this problem and promote more adaptability in the nurses. Staff are also expected to continue with their professional development and updating following registration as a nurse, and proof of such undertaking is required every three years when nurses have to renew their registration in accordance with the Post Registration Education and Practice (PREP) legislation. The reduction in junior doctor' hours has also meant that nurses are taking over more and more duties within the scope of practice framework (UKCC, 1992) that used to be the remit of medical staff. However, the lack of standardised preparation and protocols to undertake those more advanced skills may create greater opportunities for errors and jeopardise patients' safety. Staff feel pressurised to carry out these extended roles as well as their "normal" caseloads both by management and their medical colleagues. The emphasis on accountability in professional nursing practice may also act more as an hindrance than a bonus because nurses do not have the level of control over their own work to be fully accountable. It also creates a situation whereby nurses feel hesitant to ask for advice or to reveal their shortcomings because of the fear that they might be perceived as being incompetent and not being able to accept the principle of accountability which is inherent with their job. Sometimes, nurses have to shoulder responsibility for mistakes which have their origins elsewhere in the system.

There is a need for a greater emphasis on an integrated approach to clinical care. This would promote more communication between members of the health care team, enabling patients to receive continuity of care. With this approach, all team members will share responsibility for ensuring that patients receive high quality and safe care, and any problems with the patients' clinical care can be detected at the exact point where they have occurred, rather than allowing them to cascade down the system. For instance, a doctor may make a mistake in the prescription of a drug and if this has not been picked up by the pharmacist, the mistake may

only reveal itself at the point of drug administration by the nurse. If the nurse then administers the wrong prescription, blame is almost always apportioned to the nurse rather than her/his other colleagues who should be equally responsible..

The education and training of nurses both at pre and post registration level (as well as other health care staff) should not be focused just on imparting the appropriate knowledge, skills and attitudes but should also include knowledge of error causation and its prevention. In the clinical situation, supervision of student nurses and qualified nurses should be strengthened and expanded, providing support and teaching according to the specific needs of the clinicians. Thus, correctable errors can be targeted and the appropriate knowledge gaps can be identified and remedied. Thus, Post Registration Education and Practice (PREP) may not be as successful or effective as it was envisaged in updating nurses in relevant areas of clinical care if it is not firmly linked with supervision and does not target specific weaknesses in the practitioners.

### **13.2.2. Skill-mix and workload.**

The managerial approach introduced in health care and the increasing demands on finite resources have meant that the staff have to deal with increasing workload and rapid turnover of patients with diminishing number of staff to provide the actual care. Recent exercises in skill-mix have also resulted in a reduction in the number of trained nurses and an increased number of health care assistants on the wards. There is also a greater reliance on bank nurses and agency nurses. As a result, nurses have to deal with an increasing workload resulting in stress. There was also a feeling that senior staff were insensitive and unsupportive to their needs and predicament (as reported in chapter 6). This may explain the high number of slips and lapses (which flourish in these conditions) reported by nurses in the study in chapter 6. In fact these stressful and overwork conditions may encourage nurses to do shortcuts ostensibly to ensure that as

many patients as possible are at least getting the minimum care. But, in reality, these could markedly increased clinical risk to patients. Furthermore, less priority may be given to thorough assessment of patients and the recording of assessment data and care, again compromising the quality and safety of care that are delivered (as was reported in chapter 7). The loss of the shift overlap on the wards (which has been introduced avidly in most hospitals trust as a money-saving project), may also have resulted in a reduction of communication between staff of different shifts, and staff may omit to pass on critical information about patient care. Communication failures of this type was commonly reported by nurses as a cause of their error in chapter 6. According to Reason (1990), these are the very conditions which may produce clinical errors. There is an urgent need to address these problems if patients' safety were to be improved.

### **13.2.3. The need to apply lessons from psychological and human factors research to clinical situation.**

One serious attempt at preventing future errors would be to examine in what way the system may have contributed to the error and address issues such as staffing, work assignments, and improvement in the system (i.e. making the system more error-proof). This would require top-level management decisions and the commitment of additional resources which could only be obtained if a system-wide rather than an individual approach is used. Thus, errors should be accepted more as system flaws than character flaws. "Physicians, nurses, pharmacists, and administrators are to succeed in reducing errors, they will need to fundamentally change their way they think about errors and why they occur" (Leape, 1994). Although the cultivation of a norm of high standards is highly desirable and that health care staff should be encouraged to take responsibility for their actions, it is also important for nurses and other health professionals to change the current view that making an error is akin to a failure of character. Nurses need to appreciate that they cannot be held responsible for all errors that occur since no

individual nurse and doctor has the power to control all aspects of patient care (Leape,1994).

#### **13.2.3.1. Attitudes to error.**

The evidence from the literature and from the findings of the empirical studies in this thesis suggests the need for staff to drastically change their attitudes towards clinical errors. The tendency by doctors and nurses to tackle errors at an individual level and to ignore the contribution of the system in the production of errors and adverse incidents must be challenged. This clinical culture has a number of drawbacks. Firstly, lessons learnt from individual errors are not shared and any adjustment made to improve the safety of the system often takes place in a vacuum. Other staff may then not be aware of the types and range of clinical errors that are being made and the type of circumstances or conditions that predispose to their occurrences, hence failing to learn from them and to take appropriate measures to prevent or reduce them. This failure to share the experience of a mistake may also have profound emotional impact on the practitioner (Arndt, 1990; Wu et al, 1991; Christensen et al, 1992). Christensen et al (1992) note that there is no opportunities for practitioners to share the circumstances of their error and to obtain emotional support. Leape (1994) also points out that although most clinical staff recognise errors are inevitable, yet "they are denied both insight and support by misguided concepts of infallibility and fear". There is a view that clinicians are just not supposed to make mistakes, resulting in a punitive approach being used against those who have made a clinical error. A shift from this approach to a more supportive one is crucially important to enable staff to become more opened about their errors and other near-misses. This would allow proper investigation and discussion of their causes, enabling more staff to be cognisant of the types of situations that are likely to produce errors.

It is also important to note that the causal attribution of errors to internal factors (i.e. characteristics of the individual) is unlikely to promote a significant reduction of errors in clinical practice, mainly because the causes of most errors are often beyond an individual's control (Leape, 1994). For instance, a nurse may omit to give a specific care not because of lack of knowledge or ability but because of distraction due to work overload, and sending the nurse on a retraining course or severely admonishing her/him is unlikely to stop similar errors from being made by the same nurse or by other nurses if the same circumstances are to remain present.

#### **13.2.3.2 The human factors approach to dealing with errors.**

One important flaw in tackling errors by focusing on the individual is that the root cause of the error is not addressed. This tendency to direct efforts at error prevention in the clinical field at physicians and nurses is referred to as the "perfectibility model" (Leape, 1994). The idea behind this approach is that if clinical staff are admonished and/or given further training following an error, then they would be less likely to make further errors. The lessons that should be learnt is that human performance in large systems and systems failures are closely linked. Human performance is shaped by cognitive factors, but more importantly these cognitive factors are in turn influenced by organisational factors. Therefore, the most effective way of tackling the problem of errors in the clinical field is by improving the performance of complex systems (Woods et al., 1994). Cook and Woods (1991) suggest that the approach to dealing with an error should not be to focus on a single component as being responsible for the failure, but to analyse the "decisions and actions of individuals and groups embedded in the larger system that provides the resources and constraints". For instance, an error may occur when knowledge is inadequate or is not brought to bear on a situation effectively, particularly when attentional demands are excessive. A system approach to address these errors would be to assume that errors are

inevitable and to design systems to absorb them. By providing prompts and checklists (as shown with the implementation of the care pathway reported in chapter 11), the demands on the cognitive systems (particularly short term memory) are lessened, making it less likely for omissions to occur. Leape (1994) points out that when training is provided, it should emphasise not only the application of knowledge and procedures, but should also ensure that the trainees understand the rationale for "procedures as well as how errors can occur at various stages, their possible consequences, and instruction on methods for avoidance of errors".

#### **13.2.4. Improving the system of care: care pathway, clinical guidelines and evidence-based practice.**

This thesis has provided evidence that there are widespread errors of omission in the assessment records of patients either due to inadequate assessment of these patients or failure to record all pertinent information obtained from the assessment. This suggests serious quality problems in nursing practice. The study reported in chapter 11 implies that more specific, rigorous, standardised and structured approaches to nursing care in the form of a care pathway could improve the quality of assessment and care as well as reducing errors of omissions. A care pathway is a form of clinical guideline. Its implementation could result in a number of benefits both for the patients and nurses. Clinical care pathway has the potential to improve both the process and outcome of care. For instance, it can serve as a tool by which scientifically valid and reliable standards of nursing practice can be implemented, monitored and evaluated. Care pathway can provide accurate information about the risks and benefits of nursing interventions as well as their appropriateness. Mittman et al (1992) argue that clinical guidelines "will lead to more effective and efficient use of medical resources and to improved clinical outcomes".



Little writing (i.e. "free text") is required when using the care pathway as all the relevant information is pre-printed and the nurses only have to confirm that it is "happening" or to write in the "variances" when it has not happened (Johnson, 1997). This significant reduction in "free text" when using the care pathway could save nurses considerable time in the assessment and care of patients, enabling them to use their time more effectively by focusing on the specific needs of the patients and giving the appropriate care. With the growth of nursing knowledge through research, clinical guidelines can also help to disseminate the latest research findings about specific aspects of nursing care, hence providing an efficient medium for the implementation of research findings relating to nursing care. Indeed, evidence-based practice guidelines are an increasingly popular means of helping clinicians to assimilate research results which would have an impact on specific aspects of patient care. Thus, the care pathway could become an ideal tool to implement properly evaluated research findings into nursing practice as they become available, hence allowing care to be given which are based on sound principles and evidence.

### **13.3. Future Research.**

The results of the studies reported in this thesis have shown that errors of different types are common in nursing. The studies have also provided several pointers for further research to expand the extremely limited literature on nursing errors which could enable us to increase our understanding of nursing errors and their prevention. There is a need however for both qualitative and quantitative research to be undertaken. In first instance, there should probably be a bias towards hypothesis generating qualitative methods than to hypothesis testing design. This strategy may provide substantial ideas and questions that could then be addressed by quantitative research, hence mitigating the drawbacks associated with an inadequately researched field. For instance, there is a need to develop greater understanding of the perception of nurses towards errors and inadequacies

in care as well as their perception of the measures that are likely to reduce errors and inadequacies in care. This may encourage greater involvement of the staff in the change process.

The intervention study reported in chapter 11 shows that a system approach in the form of care pathway was very effective in reducing omissions in the assessment of patients with chest pain. However, there is also a need to investigate whether or not system changes of this type will bring about substantive reduction in all types of nursing errors. For instance, the use of the care pathway may compensate for inadequate knowledge and pre-empt knowledge-based mistakes, but may not be as effective in preventing skill-based errors.

It was also evident that staff were not fully compliant with the intervention, particularly towards the latter stages of the intervention study (reported in chapter 11), although a social influence approach was used as recommended by Goodpastor and Montoya (1996) to maximise compliance, i.e. opinion leaders/senior staff from each ward/clinical area were used to co-ordinate the implementation of the care pathway. But it was not clear whether these "opinion leaders" were seen as credible and influential by the clinical staff. For instance, in one clinical area, most of the hostility and obstruction to the use of the care pathway came from an "E" grade staff nurse. Although the ward sister was fully supportive of this system of care and was co-ordinating its implementation, the staff paid more heed to the staff nurse. The role and influence of the "informal" leaders in the change process need to be investigated. There is also a need to investigate what change strategies work best with nurses as well as nurses' attitudes towards changes in general.

There is an untested assumption that nursing errors are not as serious as medical mistakes. The study reported in chapter 6 provided some evidence that nursing

errors could adversely affect patient care. But further research is required to determine more specifically the impact of errors on outcomes of care. The patients' perception of errors and inadequacies in their nursing care should also be ascertained.

#### **13.4. Final conclusions.**

The magnitude of the problem of nursing errors has been acknowledged and it has been suggested that there is a need to increase nurses' awareness of the types, frequency and impact of errors in their work. There is a need to develop greater understanding of the psychological precursors of errors such as inappropriate work schedule, high workload, undue time pressures and inadequate recognition of hazards.

It has also been suggested that focusing on the individual or the unsafe acts is likely to bring only short lived benefits, and that more attention should be given to the role of the system in the production of errors as well as in error-prevention strategies. It has been shown that when a system approach was used to tackle the problem of omissions in the assessment of patients with chest pain, significant improvement in patient assessment occurred as well as other benefits on patients' outcomes. Finally, there is a need to shift from a punitive approach to a more supportive approach when dealing with errors in nursing.

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**APPENDIX 1 : RULE 18A . NURSES, MIDWIVES AND HEALTH VISITORS ACT (1989).**

Preparation for entry to parts 12, 13, 14 and 15 of the register.

**Competencies for registered nurses.**

- a) The identification of the social and health implications of pregnancy and child bearing, physical and mental handicap, disease, disability, or ageing for the individual, her or his friends, family and community.
- b) The recognition of common factors which contribute to , and those which adversely affect, physical, mental and social well-being of patients and clients and take appropriate action.
- c) The use of relevant literature and research to inform the practice of nursing.
- d) The appreciation of the influence of social, political and cultural factors in relation to health care.
- e) An understanding of the requirements of legislation relevant to the practice of nursing.
- f) The use of appropriate communication skills to enable the development of helpful caring relationships with patients and clients and their families and friends, and to initiate and conduct therapeutic relationships with patients and clients.
- g) The identification of health related learning needs of patients and clients, families and friends and to participate in health promotion.
- h) An understanding of the ethics of health care and of the nursing profession and the responsibilities which these impose on the nurse's professional practice.
- i) The identification of the needs of patients and clients to enable them to progress from varying degrees of dependence to maximum independence, or to a peaceful death.
- j) The identification of physical, psychological, social and spiritual needs of the patient or client; an awareness of values and concepts of individual care; the

*Appendix 1: Regulatory rules and framework*

ability to devise a plan of care, contribute to its implementation and evaluation; and the demonstration of the application of the principles of a problem solving approach to the practice of nursing.

k) The ability to function effectively in a team and participate in a multi-professional approach to the care of patients and clients.

l) The use of appropriate channel of referral for matters not within her sphere of competence

m) The assignment of appropriate duties to others and the supervision, teaching and monitoring of assigned duties.

**APPENDIX 1: CODE OF PROFESSIONAL CONDUCT FOR THE NURSE, MIDWIFE AND HEALTH VISITOR (UKCC, 1992).**

Each registered nurse, midwife and health visitor shall act, at all times, in such a manner as to:

- \* safeguard and promote the interests of individual patients and clients;
- \* serve the interests of society;
- \* justify the public trust and confidence and
- \* uphold and enhance the good standing and reputation of the professions.

As registered nurse, midwife or health visitor, you are personally accountable for your practice and, in exercise of your professional accountability, must:

- 1 act always in such a manner as to promote and safeguard the interests and well-being of patients and clients;
- 2 ensure that no action or omission on your part, or within your sphere of responsibility, is detrimental to the interests, condition or safety of patients and clients;
- 3 maintain and improve your professional knowledge and competence;
- 4 acknowledge any limitations in your knowledge and competence and decline any duties or responsibilities unless able to perform them in a safe and skilled manner;
- 5 work in an open and co-operative manner with patients, clients and their families, foster their independence and recognise and respect their involvement in the planning and delivery of care;
- 6 work in collaborative and co-operative manner with health care professionals and others in providing care, and recognise and respect their particular contributions within the care team;
- 7 recognise and respect the uniqueness and dignity of each patient and client, and respond to their need for care, irrespective of their ethnic origin, religious beliefs, personal attributes, the nature of their health problems or any other factor;
- 8 report to an appropriate person or authority, or at the earliest possible time, any conscientious objection which may be relevant to your professional practice;

*Appendix 1: Regulatory rules and framework*

- 9 avoid any abuse of your privileged relationship with patients and clients and the privileged access allowed to their person, property, residence or workplace;
- 10 protect all confidential information concerning patients obtained in the course of professional practice and make disclosures only with consent, where required by the order of the court or where you can justify disclosure in the wider public interest;
- 11 report to an appropriate person or authority, having regard to the physical, psychological and social effects on patients and clients, any circumstances in the environment of care which could jeopardise standards of practice;
- 12 report to an appropriate person or authority where it appears that the health and safety of colleagues is at risk, as such circumstances may compromise standards of practice and care;
- 14 assist professional colleagues, in the context of your own knowledge, experience and sphere of responsibility, to develop their professional competence and assist others in the care team, including informal carers, to contribute safely and to a degree appropriate to their roles;
- 15 refuse any gift, favour or hospitality from patients, clients currently in your care which might be interpreted as seeking to exert influence to obtain preferential consideration and
- 16 ensure that your registration status is not used in the promotion of commercial products or services, declare any financial or other interests in relevant organisations providing such goods or services and ensure that professional judgement is not influenced by any commercial considerations.

**APPENDIX 1: CLINICAL GRADING STRUCTURE: SCALES A TO I  
(Advanced letter NM 2/91).**

These scales denote pay grades only. Health Authorities/Health Boards may continue to use job titles which reflect the responsibilities of individual posts.

The appointment of staff to posts for which they do not hold the appropriate qualifications is strongly deprecated by the Nursing and Midwifery Staffs Negotiating Council.

A Registered Fever Nurse or a nurse who holds the certificate of the British Thoracic Association who is employed outside her specialty should be graded according to the responsibilities of her post.

**Scale A.**

2.10 Scale A applies to posts in which the post-holder carries assigned tasks involving direct care in support of , and supervised by, a registered nurse, midwife or health visitor.

No statutory nursing or midwifery qualification are required for posts at this level.

**Scale B**

2.11 Scale B applies to posts in which the post-holder carries assigned tasks involving direct care in support of a registered nurse, midwife or health visitor and:

- a. regularly works without supervision for all or most of the shift
- or
- b. leads a team of staff at scale A.

No statutory nursing or midwifery qualifications are required for posts at this level.

**Scale C**

2.12 Scale C applies to posts in which the post-holder provides nursing care under the direction of a registered nurse, midwife or health visitor. The post-holder participates in the assessment of care needs and the implementation of programmes of care. The post-holder may be expected to demonstrate her/his skills to new or junior members of staff.

The post-holder is normally required to have a second level registration

**Scale D**

2.13 Scale D applies to posts in which the post-holder is responsible for the assessment of care needs and the development of programmes of care, and/or the implementation and evaluation of these programmes. The post-holder is expected to carry out all relevant forms of care without direct supervision and may be required to demonstrate procedures to and supervise qualified and/or unqualified staff.

The post-holder is required to have:

- i. first level registration;  
or
- ii. second level registration plus a recognised post-basic certificate, or to have an equivalent level of skill acquired through experience;  
or
- iii. second level registration and to supervise the work of other staff.

**Scale E**

2.14 Scale E applies to posts in which:

1. The post-holder is responsible for the assessment of care needs and the development, implementation and evaluation of programmes of care;  
and
  - a. is expected to carry out all relevant forms of care and is designated to take charge regularly of a ward or equivalent sphere of nursing or midwifery in the absence of the person who has continuing responsibility. The post-holder is expected to supervise junior staff and able to teach qualified and unqualified staff, including basic and/or pot-basic students;  
or
  - b. is required to have first level registration plus:
    - i. a further registrable qualification;  
or
    - ii. a recordable post-basic certificate/statement of competence, or an equivalent level of skill acquired through experience,  
or
2. The post-holder is required to take responsibility as the prime care provider for one, or a defined group of patients/mothers, in the hospital setting. He/she works with minimal supervision in the assessment of all relevant care needs, the development, implementation and evaluation of programmes of care. The post-holder is able to supervise and teach junior staff including basic and/or post-basic students.

**Scale F**

2.15 Scale F applies to posts in which:

1. The post-holder has continuing responsibility for the management of a ward or equivalent sphere of nursing/midwifery care, including the assessment of



*Appendix 1: Regulatory rules and framework*

care needs, the development, implementation and evaluation of programmes of care, the setting of standards, and the supervision and deployment of staff; where there are no basic or post-basic students and where limited nursing or midwifery intervention is required;

or

2. The post-holder is responsible for the assessment of care needs, the development, implementation and evaluation of programmes of care, without supervision, and may be required to teach other nursing and non-nursing staff.

The post-holder:

a. is designated to take charge regularly of a ward or equivalent sphere of nursing or midwifery care in the absence of the person who has continuing responsibility and the post-holder is required to have first level registration plus:

i. a further registrable qualification;

or

ii. a recordable post-basic certificate/statement of competence, or equivalent level of skill acquired through experience;

or

iii. experience in a post at scale E,

or

b. leads a team of staff at grade E and below;

or

c. undertakes duties specific to a defined client group in the community;

or

d. is a prime care provider, who is required to practise clinical skills, developed through experience in, but more advanced than those required for, a post at Scale E.

**Scale G**

2.16 Scale G applies to posts in which:

i. The post-holder carries continuing responsibility for the assessment of care needs, the development, implementation and evaluation of programmes of care, and the setting of standards of care;

and

a. the management of a ward or equivalent sphere of nursing or midwifery, including the deployment and supervision of staff, and where the teaching of students and/or extensive nursing/midwifery intervention is required;

or

b. the management of a defined caseload, including liaison with other agencies and where appropriate the supervision, deployment and teaching of staff and/or students.

### *Appendix 1: Regulatory rules and framework*

This scale is the minimum level for district nurses, community psychiatric nurse, community mental handicap nurses with appropriate qualifications; health visitors, and midwives working in the community.

or

2. The post-holder is responsible for the management of a caseload or client group within a defined clinical area, including liaison, where appropriate, with other agencies, and the provision of specialist advice within this clinical area.

#### **Scale H**

2.17 Scale H applies to posts:

1. The post-holder carries continuing overall responsibility for the management of more than one ward or equivalent sphere of nursing, midwifery or health visiting care in the hospital and/or community setting, in which the post holder is required to meet at least 4 of the following criteria:

- i. assesses, develops, implements and evaluates programmes of care;
- ii. monitors and ensures maintenance of standards of care;
- iii. provides advice within own clinical area;
- iv. formulates policies within own sphere;
- v. supervises, deploys and develops staff;
- vi. participates in research and/or equipment testing;
- vii. is designated as a statutory supervisor of midwives.

or

2. The post-holder, in addition to carrying continuing responsibility for a defined caseload, including the setting of standards of care needs, the development, implementation and evaluation of programmes of care, also carries responsibility for the planning of practical experience for, and the teaching and supervision of, one or more students undertaking training leading to a post-basic statutory or formal qualification.

The post-holder is required to hold the appropriate teaching certificate.

This scale is the minimum level for qualified field work and practical work teachers.

or

4. The post-holder is identified as a clinical specialist within the employing Authority. He/she will normally have direct clinical involvement in, and extensive knowledge of, the defined specialty with evidence of relevant post-basic study. The post-holder is responsible for providing clinical advice and support to, and liaising with, other staff.

In addition the post-holder is required to meet the grading indication factors.

**Scale I**

2.18. Scale I applies to posts in which:

i. The post-holder carries continuing overall responsibility for the management of more than one ward or equivalent sphere of nursing, midwifery or health visiting care in the hospital and/or community setting in which the post-holder is required to meet at least 7 of the following criteria:

- i. assesses, develops, implements and evaluates programmes of care;
- ii. monitors and ensures maintenance of standards of care;
- iii. provides advice both within and outside own profession;
- iv. formulates policies within own sphere;
- v. supervises, deploys and develops staff;
- vi. participates in research and/or equipment testing;
- vii. is designated as a statutory supervisor of midwives;
- viii. decides composition of skill mix of staff within own sphere of responsibility;
- ix. has responsibility for selection and appointment of staff;
- x. has financial control of manpower or physical resources;
- XI. manages a changing and/or developing service.

or

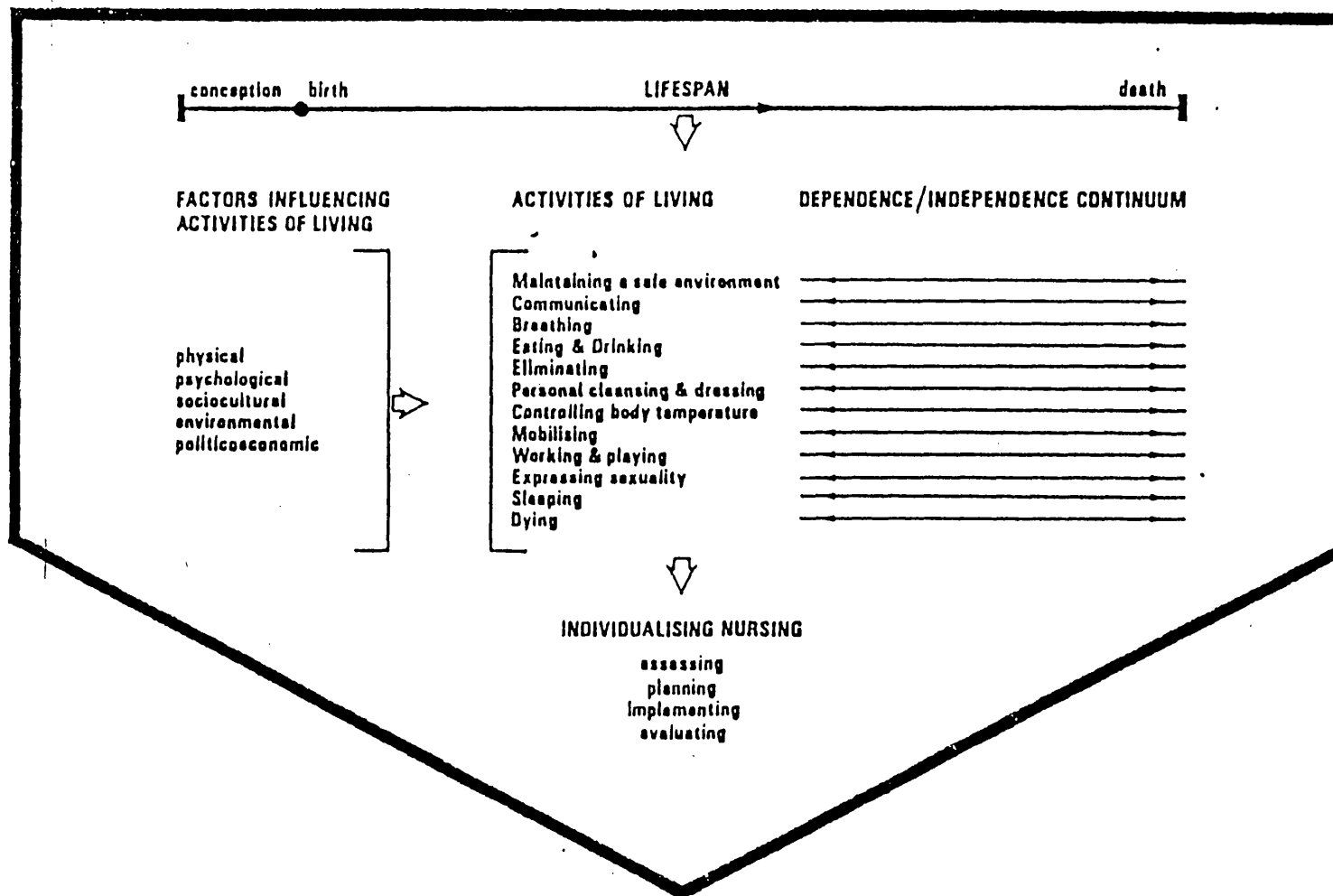
2. The post-holder is responsible for assessing training needs, planning, implementing and evaluating in education and training of students for registration, post-basic qualifications and/or in-service training, in the classroom or in both the classroom and clinical setting.

The post-holder is required to hold a recordable teaching qualification.

or

3. The post-holder is identified as a clinical specialist within the employing Authority. He/she will normally have direct clinical involvement in, and extensive knowledge of, the defined specialty and evidence of relevant post-basic study. The post-holder is responsible for providing clinical advice and support to, and liaising with, other staff. In addition the post-holder is required to meet the grading indication set out.

The Roper/Logan/Tierney model for nursing





{CONFIDENTIAL}

**INAPPROPRIATE NURSING DECISIONS AND ACTIONS**  
*(How can we learn from them?)*

We know that some errors (very often unintentionally) are made in the delivery of nursing care. We can learn from them and improve the quality of nursing care. This study is designed to find out the types of errors nurses make and to identify the most constructive way to deal with them.

**What do we mean by nursing errors ?**

Nursing errors may be defined as **decisions, omissions or acts:**

1. for which you felt responsible;
2. which caused or could have caused distress to the patient
3. which had adverse or potentially adverse consequences for the patient;
4. which would have been judged wrong by knowledgeable peers at the time they occurred.

Please try to remember an error (not a drug error) you may have made in the care of your patient since you were registered as a nurse:

1(a) Briefly describe the error in the space below: {Please note that drug error is not covered in this study}

(b) When did the error occur? {Please tick the response that best applies}

- |  |  |
|--|--|
| <input type="checkbox"/> In last six months      | <input type="checkbox"/> In last year    |
| <input type="checkbox"/> In last 2 years         | <input type="checkbox"/> In last 3 years |
| <input type="checkbox"/> In last 4 years or over |  |

*Appendix 2 - Nursing error study*

**Circumstances of the error:**

- 2. How long were you qualified when the error was made:
  
- 3. How old was the patient: {Please tick the answer that best applies}
  - Less than 16 years old
  - 16 - 64 years old
  - More than 65 years old
  
- 4. In which type of ward or department did the error occur:
  
- 5. What was the patient’s overall level of functioning prior to the error? {Please tick}
  - Fully functioning
  - Mildly compromised functioning
  - Moderately compromised functioning
  - Severely compromised functioning
  
- 6. How was the patient affected by the error ? {Please tick one}
  - Not at all  Mildly  Moderately  Severely  Very severely  Don’t know

**Causes of the error**

The next group of questions are about perceived causes of the error  
 {For each item, please tick the response that best applies}

7. The error occurred because:

		<i>Strongly Disagree</i>	<i>Disagree Somewhat</i>	<i>Agree Somewhat</i>	<i>Agree Strongly</i>
a.	I was unfamiliar with the procedure at that time				
b.	Though I was responsible, someone else made the mistake				
c.	I didn’t have the information I should have known				
d.	I made up my mind too quickly in deciding what to do				
e.	I was distracted by having too much on my plate				
f.	The supervision by the senior staff was inadequate				

Any other {Please specify} .....

.....

Appendix 2 - Nursing error study

8. How well do each of the following describe your error:

		<i>Strongly Disagree</i>	<i>Disagree Somewhat</i>	<i>Agree Somewhat</i>	<i>Agree Strongly</i>
a.	My attention wandered				
b.	I had a lapse of memory				
c.	I made the wrong decision				
d.	I assessed the situation wrongly				
e.	I missed the warning signs				
f.	I gave inaccurate / inadequate information				
g.	I relied on someone else's judgement				
h.	I acted beyond my competence				

Other: {Please specify} .....

9. How well do each of the following describe the atmosphere in the ward/dept at the time of the error:

		<i>Strongly Disagree</i>	<i>Disagree Somewhat</i>	<i>Agree Somewhat</i>	<i>Agree Strongly</i>
a.	The environment on the ward / dept was particularly stressful				
b.	There was bad feeling between the staff on the ward / dept.				
c.	Senior staff just expected you to get on with the work regardless				
d.	Taking 'short-cut' was almost the norm on the ward / dept.				

Other {Please specify} .....

**Reactions to the error:**

{For each item, tick the response that best applies}

10. As a result of the error

		<i>Strongly Disagree</i>	<i>Disagree Somewhat</i>	<i>Agree Somewhat</i>	<i>Agree Strongly</i>
a.	I was angry at myself				
b.	I was angry at other people				
c.	I felt inadequate				
d.	I was fearful of repercussions				
e.	I felt guilty				

f. Others {please specify}.....

*Appendix 2 - Nursing error study*

11. Did you talk to anyone about the error YES / NO

12. If YES to above, to whom did you talk  
 {Tick all responses that apply}

- Senior Nurse on the ward
- Nurse Manager
- One of your colleagues
- Doctor
- Other Professional {Specify} .....
- Member of your Union
- Member of your Professional body
- The patient
- The patient's relative
- Your spouse or significant other
- Other {Please specify} .....
- .....

***Coping with the error:***

13. When you made the error, what strategies did you use to cope:  
 {For each item, please tick the appropriate response}

		<i>Not Used</i>	<i>Used Somewhat</i>	<i>Used quite a bit</i>	<i>Used a great deal</i>
a.	I criticised or lectured myself				
b.	I went on as if nothing had happened				
c.	I tried to keep my feelings to myself				
d.	I accepted sympathy and understanding from someone				
e.	I tried to forget the whole thing				
f.	I made a plan of action and followed it				
g.	I didn't let it get to me: I refused to think about it too much				
h.	I asked a relative or friend I respected for advice				
i.	I kept others from knowing how bad things were				
j.	I talked to someone about how I was feeling				
k.	I knew what had to be done, so I doubled my efforts to make things work				
l.	I tried to keep my feelings from interfering with other things too much				
m.	I wished the situation would go away or somehow be over				
n.	I had fantasies about how things might turn out				

Any other coping strategies used {please specify} .....

.....

.....



*Appendix 2 - Nursing error study*

14. Discussion with Clinical Staff

- (a) Was the error discussed with senior staff YES / NO
- (b) Were you counselled for the error YES / NO
- (c) Were you disciplined for the error YES / NO

15. After discussion of the error with Senior Staff {Please tick all responses that apply}

		<i>Strongly Disagree</i>	<i>Disagree Somewhat</i>	<i>Agree Somewhat</i>	<i>Agree Strongly</i>
a.	I lost professional respect				
b.	I felt supported for the way the case was handled				
c.	I felt humiliated				
d.	The <i>real</i> cause of the error was not tackled				
e.	The action taken against me far outweighed the seriousness of the error				
f.	I felt I was used as a scapegoat				

***Changes in practice due to the error:***

Sometimes an error may change the way you practice. To what extent do the following statements reflect how you reacted to the error.

{For each item, tick the response that best applies}

16. As a direct consequence of having made the error:

		<i>Strongly Disagree</i>	<i>Disagree Somewhat</i>	<i>Agree Somewhat</i>	<i>Agree Strongly</i>
a.	I asked my colleagues what they would have done in a similar situation				
b.	I pay more attention to detail				
c.	I feel less confident in my work				
d.	I try to read the patient's note / care plan more carefully				
e.	I get more worried				
f.	I am less trusting of other's capability				
g.	I am more likely to seek advice				
h.	I keep better record on the patients				
i.	I am more likely to keep an error to myself if at all possible				
j.	I do more observations on patients				

k. Made some other changes in my practice {Please specify}

*Appendix 2 - Nursing error study*

17. Overall, thinking about this error, to what extent would you say it:

		<i>Not at all</i>	<i>A little</i>	<i>Quite a bit</i>	<i>A great deal</i>
a.	Has had a profound effect on your practice				

**Demographics:**

18. What was your marital status at the time the error was made?

- Single
- Married
- Living with significant other
- Divorced
- Widowed

19. What is your sex ? Male / Female

20. What is your present post ?

21. What was your grade at the time of the error  
{Tick as appropriate}

- |                            |                                |
|----------------------------|--------------------------------|
| <input type="checkbox"/> C | <input type="checkbox"/> G     |
| <input type="checkbox"/> D | <input type="checkbox"/> H     |
| <input type="checkbox"/> E | <input type="checkbox"/> I     |
| <input type="checkbox"/> F | <input type="checkbox"/> Other |

22. We would welcome any additional comments you might have.  
{Please use the space below or additional paper if required to write your comments}

**Thank you very much for your help**

Appendix 3 - Audit of Chest Pain Assessment

<b>MEDICAL UNIT ASSESSMENT FORM FOR CHEST PAIN</b>
--

NAME:	
HOSPITAL NUMBER:	
AGE:	
DATE:	TIME:

PRESENTING COMPLAINT(S)/PROBLEM(S) RECORDED
---

No	Yes Partially	Yes Fully
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

PAST MEDICAL HISTORY/ADMISSIONS RECORDED
--

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

CURRENT MEDICATION RECORDED
-----------------------------

Yes	No
<input type="checkbox"/>	<input type="checkbox"/>

HISTORY OF CHEST PAIN
-----------------------

No	Yes Partially	Yes Fully
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

DESCRIPTION OF CURRENT CHEST PAIN RECORDED
--

Partial	Full
<input type="checkbox"/>	<input type="checkbox"/>

RELATIONSHIP OF PAIN TO ACTIVITY RECORDED
---

No	Yes
<input type="checkbox"/>	<input type="checkbox"/>

INTENSITY OF PAIN RECORDED
----------------------------

No	Yes Partially	Yes Fully
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ASSOCIATION OF PAIN WITH OTHER SYMPTOMS RECORDED
--

No	Yes
<input type="checkbox"/>	<input type="checkbox"/>

BP TAKEN AND EVALUATED
------------------------

No	Yes Partially	Yes Fully
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

RESULT OF ECG NOTED
---------------------

No	Yes
<input type="checkbox"/>	<input type="checkbox"/>

*Appendix 3 - Audit of Chest Pain Assessment*

PSYCHOLOGICAL REACTION TO CHEST PAIN/CONDITION ASSESSED	No <input type="checkbox"/>	Yes Partially <input type="checkbox"/>	Yes Fully <input type="checkbox"/>
BREATHING ASSESSED	No <input type="checkbox"/>	Yes Partially <input type="checkbox"/>	Yes Fully <input type="checkbox"/>
KNOWLEDGE OF CONDITION ASSESSED	No <input type="checkbox"/>	Yes <input type="checkbox"/>	
GENERAL APPEARANCE NOTED (e.g. build/weight/cold clammy skin/grey skin/cyanotic skin)	No <input type="checkbox"/>	Yes Partially <input type="checkbox"/>	Yes Fully <input type="checkbox"/>
SMOKING PATTERN ASSESSED	No <input type="checkbox"/>	Yes Partially <input type="checkbox"/>	Yes Fully <input type="checkbox"/>
DRINKING PATTERN ASSESSED	No <input type="checkbox"/>	Yes Partially <input type="checkbox"/>	Yes Fully <input type="checkbox"/>
FOOD HABITS ASSESSED	No <input type="checkbox"/>	Yes Partially <input type="checkbox"/>	Yes Fully <input type="checkbox"/>
OCCUPATION AND PAST TIME RECORDED	No <input type="checkbox"/>	Yes Partially <input type="checkbox"/>	Yes Fully <input type="checkbox"/>
PROBLEMS LISTED IN ADMISSION NOTES	No <input type="checkbox"/>	Yes <input type="checkbox"/>	

MEDICAL UNIT

Assessment form for chest pain

Criteria

1. Presenting Complaint(s)/Problems(s) recorded.

No	Reason for admission not recorded
Yes Partially	Only chest pain recorded
Yes Fully	<ul style="list-style-type: none"> <li>• Chest pain recorded</li> <li>• When happened?</li> <li>• Where happened?</li> </ul>

2. Past medical history/admissions recorded

No	Not recorded whether patient has past medical history or not.
Yes	Past medical history or admissions recorded

3. Current medication recorded

No	No record on admission sheet
Yes	Stated on record whether or not patient is taking any medication

4. History of Chest pain

No	Only chest pain recorded
Yes Partially	History described only briefly, e.g. <ul style="list-style-type: none"> <li>• Previous chest pain/MI</li> <li>• Frequency of chest pain</li> </ul>
Yes Fully	History fully described <ul style="list-style-type: none"> <li>• Previous chest pain</li> <li>• Frequency</li> <li>• What seems to provoke it</li> <li>• What relieves it</li> <li>• What treatment/medical advice followed, if any</li> </ul>

5. Description of current chest pain

Partial	Only chest pain recorded
Full	Full description given, e.g. <ul style="list-style-type: none"> <li>• Chest pain</li> <li>• Location (? central)</li> <li>• Any radiation?</li> </ul>

*Appendix 3 - Criteria for Chest Pain Audit*

6. Relationship of pain to activity recorded

No	Only chest pain recorded
Yes	Relationship of chest pain to activity recorded, e.g. <ul style="list-style-type: none"> <li>• Pain on exertion?</li> <li>• Pain at rest?</li> </ul>

7. Intensity of pain recorded

No	Only chest pain recorded
Yes Partially	Level of pain stated, e.g. <ul style="list-style-type: none"> <li>• mild</li> <li>• severe</li> </ul>
Yes Fully	Pain fully described, e.g. <ul style="list-style-type: none"> <li>• mild or severe</li> <li>• Appropriate adjectives used (i.e. gripping pain, unbearable pain, etc.)</li> <li>• Or a scale used.</li> </ul>

8. Association of pain with other symptoms recorded

No	Only chest pain recorded
Yes	Whether accompanying symptoms (e.g. nausea/vomiting/dizziness) present or not stated

9. BP taken and Evaluated

No	Not stated whether BP taken on arrival
Yes Partially	BP recorded on admission but not evaluated in writing
Yes Fully	BP recorded on admission and commented upon, e.g. <ul style="list-style-type: none"> <li>• normal</li> <li>• affected by chest pain</li> <li>• Too high/too low</li> </ul>

10. Result of ECG noted

No	Not recorded in nursing notes
Yes	Recorded in nursing notes

11. Psychological reaction to chest pain/condition assessed

No	Not stated whether patient is anxious or not
Yes Partially	Type of psychological reaction(e.g. anxiety) listed
Yes Fully	Type of reaction listed as well as reason for it

*Appendix 3 - Criteria for Chest Pain Audit*

12. Breathing Assessed

No	Respiratory rate not recorded
Yes	Respiratory rate recorded
Partially	
Yes	Respiratory rate recorded and comments made whether any
Fully	breathing difficulty is present or not

13. Knowledge of condition

No	No record of assessment of knowledge
Yes	Patient asked what he thought was wrong with him

14. General appearance noted

No	No evidence of assessment of general appearance in admission document
Yes	Only briefly assessed
Partially	
Yes	Comprehensive assessment including whether patient is obese or
Fully	not, presence of cyanosis or pale clammy skin

15. Smoking pattern assessed

No	No evidence of assessment
Yes	Information written relating to whether patient smokes or not
Partially	
Yes	Full information on smoking pattern given including no. of
Fully	cigarettes smoked/or passive smoking/or previous smoking pattern

16. Drinking pattern assessed

No	No evidence of assessment
Yes	Information written relating whether patient drinks or not
Partially	
Yes	Types and amount of alcohol intake given
Fully	

17. Food habits assessed

No	No evidence of assessment
Yes	Just likes and dislikes assessed
Partially	
Yes	Assessment covered intake of potentially harmful food (e.g. animal
Fully	fats).

*Appendix 3 - Criteria for Chest Pain Audit*

18. Occupation and past time recorded

No	Occupation and/or past time not recorded
Yes Partially	Only occupation recorded
Yes Fully	Both occupation and past time recorded

19. Problems listed

No	Problems (outside diagnosis) not listed in assessment sheet or admission notes
Yes	Problems (outside diagnosis) described fully in assessment sheet/or admission notes



**CHEST PAIN - CARE PATHWAY  
ASSESSMENT CHECKLIST**

<b>ACTIVITIES OF LIVING</b>	<b>PROCESS</b>	<b>VARIANCES</b>
(Maintaining safe environment) Chest pain : Angina	Onset Location Precipitating factor Intensity (use a scale) What relieves it ECG Pulse Blood Pressure Respiration	
Communicating	Is patient worried? Source of Worries	
Breathing	Is patient breathless? Respiratory rate Colour Breathing Sounds	
Eating and drinking	Food preferences (is it a balanced diet?) Intake of animal fats Intake of dairy products	
Eliminating	Bowel pattern Micturition	

Appendix 3 - Initial development of care pathway

ACTIVITIES OF LIVING	PROCESS	VARIANCES
Personal cleansing and dressing	Appearance : Is patient obese or of normal build? Is patient able to wash/dress self without getting breathless or pain?	
Controlling body temperature	Is body temperature normal?	
Mobilising	Premorbid mobility Breathless on mobility? Pain on mobility	
Working and playing	Occupation Does patient smoke? How many? Does patient take alcohol? (How much? How often?) Nature of activity (pastime After work)	
Expressing sexuality	Marital status	
Sleeping	Is patient's sleep disturbed by pain?	
Dying	How serious does the patient rate the chest pain	

Comments on doctors assessment/diagnosis

**CHEST PAIN - CARE PATHWAY  
DAY 1**

PROBLEM	OUTCOME	PROCESS	VARIANCES
1. Alteration in comfort secondary to chest pain	Chest pain is controlled by GTN and or analgesics	(i) Rates each episode of chest pain (using a scale) (ii) Maintains bed rest (iii) ECG taken (iv) Monitors Pulse /BP/respiratory rate 4 hourly (v) Checks skin colour (vi) Gives medication as prescribed/needed (vii) Reports effects of medication (viii) Observes urine output (ix) Checks venflon site/infusion/heparin (x) Checks reaction to pain	
2. Potential for untoward effects of medication	Demonstrate no untoward effects of medication	(i) Observe mental status (any headache? dizziness?) (ii) Any tachycardia? (iii) Any hypotension? (iv) Any bleeding?	

**CHEST PAIN - CARE PATHWAY**

**DAY 1 (Contd.)**

<b>PROBLEMS</b>	<b>OUTCOME</b>	<b>PROCESS</b>	<b>VARIANCES</b>
3. Restriction in activity secondary to chest pain	Maintains bed rest Avoids complications	(i) Ensures bed rest maintained  (ii) Teaches patient to carry out leg exercises  (iii) Explains importance of leg exercise  (iv) Observes both limbs daily  (v) Records bowel action  (vi) Attends patient hygiene	
4. Knowledge deficit related to hospitalisation and chest pain	Can give a simple reason for hospitalisation	(i) Checks that patient understands reason for admission  (ii) Checks that patient had an idea about condition and proposed treatment.	

Nursing Notes/Handover

**CHEST PAIN - CARE PATHWAY**

**DAY 2**

<b>PROBLEM</b>	<b>OUTCOME</b>	<b>PROCESS</b>	<b>VARIANCES</b>
Alteration in comfort secondary to chest pain	Is free of chest pain or chest pain is controlled by 3 or fewer GTN	(i) Rates each episode of chest pain (using a scale) (ii) Patient sits in a chair (iii) ECG taken (iv) Monitors Pulse/BP/Respiratory rate 4 hourly (v) Observes urine output (vi) Reports effects of medication (vii) Checks venflon site/heparin infusion (viii) Checks reaction to pain/condition	
Potential for untoward effects of medication	Demonstrates no untoward effects of medication	(i) Observes mental status (e.g. headache, dizziness) (ii) Any tachycardia? (iii) Any hypotension? (iv) Any bleeding	

Appendix 3 - Initial development of care pathway

Day 2 (contd.)

PROBLEM	OUTCOME	PROCESS	VARIANCES
Restriction in activity secondary to chest pain	Tolerates sitting in a chair	(i) Patient to walk round the bed and sit in a chair (ii) Advises patient to carry out leg exercises (ii) Observes both limbs daily (iv) Records bowel actions (v) Assist patient in washing self (vi) Checks pulse rate after an activity (e.g. walking round bed or washing). (vii) Records any shortness of breath arising from an activity (viii) Records any pains arising from an activity.	
Knowledge deficit related to hospitalisation and chest pain	To meet objectives of angina teaching plans	(i) Checks patient's understanding of the cause of chest pain (ii) Checks patient's understanding of relationships between activity and pain (iii) Checks patient's understanding of GTN on pain	

Nurses handover/Doctor's round

Comments on doctor's round

Evaluation of care

**CHEST PAIN - CARE PATHWAY**

**DAY 3 - 4**

<b>PROBLEM</b>	<b>OUTCOME</b>	<b>PROCESS</b>	<b>VARIANCES</b>
1. Alteration in comfort secondary to chest pain	Is free of chest pain or chest pain is controlled by 3 or fewer GTN	(i) Rates each episode of pain (using a scale) (ii) Slates circumstances in which pain occurs (iii) ECG taken (iv) Monitors Pulse BP/Respiratory rate 4 hourly (v) Records effects of medication if taken (vi) Checks venflon site (vii) Checks reaction to pain	
2. Potential for untoward effects of medication	Demonstrates no adverse effects	(i) Observes mental status (e.g. headache, dizziness) (ii) Any tachycardia? (iii) Any hypotension	
3. Restrictions in activity secondary to chest pain	Ambulates ad lib and completes activities of living without chest pain	(i) Patient to start graduated exercises (e.g. walking to washroom, toilet) (ii) To carry out activities of living (iii) Observes both limbs (iv) Records bowel action	

**CHEST PAIN - CARE PATHWAY**

**DAY 3 - 4 (Continued)**

PROBLEM	OUTCOME	PROCESS	VARIANCES
4. Knowledge deficit related to chest pain	To meet objectives of angina teaching plans	(i) To be able to state causes of angina  (ii) To be able to state precipitating factor(s)  (iii) To be able to explain effects of medication and potential side effects.  (iv) To be able to discuss post hospital self care	

Nurses' notes/handover/Doctor's round



**CHEST PAIN - CARE PATHWAY**

**DAY 5 (PRE-DISCHARGE)**

<b>PROBLEM</b>	<b>OUTCOME</b>	<b>PROCESS</b>	<b>VARIANCES</b>
1. Potential alteration in comfort secondary to chest pain	Controls pain with prophylactic medication	(i) Checks whether or not patient has had pain (ii) Checks that patient is using self-medication appropriately (ii) Observes BP/Pulse daily	
2. Potential for untoward effects of medication regimes	Demonstrates no adverse effects	(i) Checks for any medication intolerance (ii) Checks that patient is taking medication as scheduled.	
3. Alterations in AL's secondary to chest pain	Able to modify activities of living to control chest pain	(i) Checks patient's understanding of exercise modification to control pain (ii) Checks that patient's is taken GTN at appropriate time for optimal pain control	
4. Knowledge deficit related to angina	To meet objectives of angina teaching plan	(i) Checks that patient can identify own risk factors (ii) Checks that patient understands activities to control risk factors (iii) Checks that patient can identify own risk factors	

Nurses' notes/Doctor's instructions



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*Faculty of Applied Sciences  
Centre for Healthcare Education*

**AND  
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Please answer all the questions

- 1. Type of Ward
- 2. Grade
- 3. Sex
- 4. When did you qualify as a nurse

5. What information/observations do you consider as important when assessing a person with chest pain. Please list below as many as you can recall:-


- 6. To what extent are the following information taken when assessing a patient with chest pain (tick as appropriate)
  - i. Full history of chest pain      Always taken  1  2  3  4  5  Not taken
  - ii. Intensity of chest pain      Always taken  1  2  3  4  5  Not taken

*Appendix 4 - Perceptions of omissions and clinical knowledge studies*

- iii. Association of chest pain with other symptoms/signs Always taken 

1	2	3	4	5
---	---	---	---	---

 Not taken
- iv. Recording of ECG results Always taken 

1	2	3	4	5
---	---	---	---	---

 Not taken
- v. Recording of presence or absence of shock/circulatory collapse Always taken 

1	2	3	4	5
---	---	---	---	---

 Not taken
- vi. Information relating to smoking habits of patient Always taken 

1	2	3	4	5
---	---	---	---	---

 Not taken
- vii. Information relating to the patient's dietary habits Always taken 

1	2	3	4	5
---	---	---	---	---

 Not taken

7. To what extent do you agree or disagree with the following causes of omissions in the assessment of patients with chest pain

- i. Not enough time Fully Agree 

1	2	3	4	5
---	---	---	---	---

 Fully Disagree
- ii. Patient's condition Fully Agree 

1	2	3	4	5
---	---	---	---	---

 Fully Disagree
- iii. Different nurses involved in assessment Fully Agree 

1	2	3	4	5
---	---	---	---	---

 Fully Disagree
- iv. Patient transferred from another ward Fully Agree 

1	2	3	4	5
---	---	---	---	---

 Fully Disagree
- v. Work overload Fully Agree 

1	2	3	4	5
---	---	---	---	---

 Fully Disagree
- vi. Poor assessment documentation Fully Agree 

1	2	3	4	5
---	---	---	---	---

 Fully Disagree
- vii. Stressful atmosphere Fully Agree 

1	2	3	4	5
---	---	---	---	---

 Fully Disagree
- viii. Lack of checking Fully Agree 

1	2	3	4	5
---	---	---	---	---

 Fully Disagree
- ix. Lack of familiarity with current management of chest pain Fully Agree 

1	2	3	4	5
---	---	---	---	---

 Fully Disagree
- x. Not realising that assessment is incomplete Fully Agree 

1	2	3	4	5
---	---	---	---	---

 Fully Disagree

8. In your view, what is the most important cause of omission in the assessment of patient with chest pain.

--

9. Give below your impression of the cause you have written down in no. 8

*Appendix 4 - Perceptions of omissions and clinical knowledge studies*

- i. The cause is something that reflects an aspect of yourself. 

9	8	7	6	5	4	3	2	1
---	---	---	---	---	---	---	---	---

 The cause is something that reflects an aspect of the situation.
- ii. The cause is controllable by you or other people. 

9	8	7	6	5	4	3	2	1
---	---	---	---	---	---	---	---	---

 The cause is uncontrollable by you or other people.
- iii. The cause is something that is permanent. 

9	8	7	6	5	4	3	2	1
---	---	---	---	---	---	---	---	---

 The cause is something that is temporary.
- iv. The cause is something intended by you or other people. 

9	8	7	6	5	4	3	2	1
---	---	---	---	---	---	---	---	---

 The cause is something unintended by you or other people.
- v. The cause is something that is outside of you. 

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

 The cause is something inside of you.
- vi. The cause is something that is variable over time. 

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

 The cause is something that is stable over time.
- vii. The cause is something about you. 

9	8	7	6	5	4	3	2	1
---	---	---	---	---	---	---	---	---

 The cause is something about others.
- viii. The cause is something that is changeable 

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

 The cause is something that is unchangeable
- ix. The cause is something for which no-one is responsible 

1	2	3	4	5	6	7	8	9
---	---	---	---	---	---	---	---	---

 The cause is something for which someone is responsible

10. How **relevant** do you consider the following information/observations in the assessment of a patient with chest pain.

- i. Full description of presenting complaint (i.e. chest pain). 

Very Relevant	1	2	3	4	5	Not Relevant
---------------	---	---	---	---	---	--------------
- ii. Past medical history 

Very Relevant	1	2	3	4	5	Not Relevant
---------------	---	---	---	---	---	--------------
- iii. The medication that the patient is currently taking 

Very Relevant	1	2	3	4	5	Not Relevant
---------------	---	---	---	---	---	--------------
- iv. History of the chest pain 

Very Relevant	1	2	3	4	5	Not Relevant
---------------	---	---	---	---	---	--------------
- v. Relationship of pain to activity 

Very Relevant	1	2	3	4	5	Not Relevant
---------------	---	---	---	---	---	--------------
- vi. Association of the chest pain with other symptoms/sign 

Very Relevant	1	2	3	4	5	Not Relevant
---------------	---	---	---	---	---	--------------
- vii. A record of presence/absence of shock 

Very Relevant	1	2	3	4	5	Not Relevant
---------------	---	---	---	---	---	--------------
- viii. A record of presence/absence of oedema 

Very Relevant	1	2	3	4	5	Not Relevant
---------------	---	---	---	---	---	--------------
- ix. A record of presence/absence of breathlessness 

Very Relevant	1	2	3	4	5	Not Relevant
---------------	---	---	---	---	---	--------------

*Appendix 4 - Perceptions of omissions and clinical knowledge studies*

- x A record of ECG results Very Relevant 

1	2	3	4	5
---	---	---	---	---

 Not Relevant
- xi. An evaluation of BP Very Relevant 

1	2	3	4	5
---	---	---	---	---

 Not Relevant
- xii An evaluation of pulse rate Very Relevant 

1	2	3	4	5
---	---	---	---	---

 Not Relevant
- xiii Smoking habits of patient Very Relevant 

1	2	3	4	5
---	---	---	---	---

 Not Relevant
- xiv Drinking habits of patient Very Relevant 

1	2	3	4	5
---	---	---	---	---

 Not Relevant
- xv. Dietary habits of patient Very Relevant 

1	2	3	4	5
---	---	---	---	---

 Not Relevant
- xvi. A list of patient problems Very Relevant 

1	2	3	4	5
---	---	---	---	---

 Not Relevant

11. How helpful do you find the assessment documentation you currently use for patients admitted with chest pain

Very helpful 

1	2	3	4	5
---	---	---	---	---

 Not helpful

12. How do you rate your responsibility in relation to health education of patients with chest pain

Very responsible 

1	2	3	4	5
---	---	---	---	---

 Not responsible

*Thank you for participating in this research.*

**CHEST PAIN: ANGINA/MYOCARDIAL INFARCTION - NURSING ASSESSMENT**

Name:		Date of transfer:	Date of Discharge
Hospital No:		Ward:	
Consultant:		Signed:	

Surname	First name(s)	D.O.B.	Age Status	Hospital No.	Consultant	Named Nurse	Ward	Religion
Patient Label		Admission Time		Date	From where	Past medical history/admissions Yes <input type="checkbox"/> Please specify		
		Reason for admission : Diagnosis:						
GP Next of Kin Name: Relationship: Address:		Patient's understanding of condition				None <input type="checkbox"/>		
		Allergies		Property & valuables Yes <input type="checkbox"/> No <input type="checkbox"/>				
Tel. No. Notified: Yes <input type="checkbox"/> No <input type="checkbox"/>				with patient				
				sent home				
Other significant person Name: Relationship: Address:				in Property Office page no.				
		Other relevant information/remarks						
Tel. No. Notified: Yes <input type="checkbox"/> No <input type="checkbox"/>								
Name and contact number for nights								

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Name: \_\_\_\_\_

**CHEST PAIN: ANGINA/MYOCARDIAL INFARCTION -  
NURSING ASSESSMENT**

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Communicating      Anxious        Distressed        Comments \_\_\_\_\_

Breathing      Breathless        Wheeze        Comments \_\_\_\_\_

Heart Failure

Eating/Drinking      Nauseated        Vomiting        IV        Normal Diet        Special diet \_\_\_\_\_

Fluid balance record : Yes  No  Other comments \_\_\_\_\_

Body Temperature      Normal     Abnormal     Comments \_\_\_\_\_

Personal Cleansing & Dressing      Obese     Oedema     Needs assistance with hygiene: Yes  No

Comments \_\_\_\_\_



Name:

**ANGINA/MYOCARDIAL INFARCTION/CHEST PAIN  
- NURSING ASSESSMENT**

Mobilising

Pain on Activity  Breathless on Activity  Comments \_\_\_\_\_

Dizziness  Risk of Pressure Sores : High  Low  Waterlow Score

Working & Playing

Occupation \_\_\_\_\_ Retired  Smoker  No. per day \_\_\_\_

Alcohol  Social  Regular  Heavy

Other Activities \_\_\_\_\_

Expressing Sexuality

Married  Single  Divorced  Separated  Other \_\_\_\_\_

Sleeping

Normal  Poor  Comments \_\_\_\_\_

### SUMMARY OF ASSESSMENT

Problems Identified	Immediate Intervention
1.	
2.	
3.	
4.	

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<i>Signature</i>	<i>Assessment Complete</i> <input type="checkbox"/> <i>Incomplete</i> <input type="checkbox"/>	<i>Date/Time</i>	<i>Reviewed</i> <input type="checkbox"/> <i>Signature</i> _____ <i>Date</i> _____
------------------	---	------------------	---



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**UNIVERSITY COLLEGE**  
**NORTHAMPTON**

**AND**  
**UNIVERSITY COLLEGE, LONDON**

Dear Colleague,

**Re: Learning from our errors**

I am doing a study to find out what factors influence whether or not nurses learn from their errors. I would appreciate if you would participate in this study by completing the attached questionnaire. The questionnaire relates to an hypothetical error.

Please try to vividly imagine, for approximately one minute, as being the person who has made the error.

Many thanks for your participation.

Yours sincerely,

Clency Meurier

Date:



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**UNIVERSITY COLLEGE**  
**NORTHAMPTON**

**AND**  
**UNIVERSITY COLLEGE, LONDON**

1. Please try to vividly imagine yourself as having made the following error:

A patient had recently returned from surgery after a prostatectomy. You had done a post-operative check on the patient's condition and found him to be doing satisfactorily. However, you did not tape down the urinary catheter as was requested in the written post-operative instruction sheet. The untaped catheter was found to have come out when the surgeon came to check the patient on that day. The patient suffered severe trauma to his urethra and was bleeding quite a lot.

2. Give one major cause of the error:

.....  
 .....

3. Give below your impression of this cause:

- |    |   |   |   |   |   |   |   |   |   |   |  |
|----|---|---|---|---|---|---|---|---|---|---|--|
| a. | Is the cause(s) something that:<br>Reflects an aspect of yourself | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Reflects an aspect of<br>situation       |
| b. | Is the cause(s):<br>Controllable by you or other<br>people        | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Uncontrollable by<br>you or other people |
| c. | Is the cause(s) something that is<br>Permanent                    | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Temporary                                |
| d. | Is the cause(s) something:<br>Intended by you or other people     | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Unintended by you<br>or other people     |
| e. | Is the cause(s) something that is:<br>Outside of you              | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Inside of you                            |
| f. | Is the cause(s) something that is:<br>Variable over time          | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Stable over time                         |
| g. | Is the cause(s):<br>Something about you                           | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Something about<br>others                |
| h. | Is the cause(s) something that is:<br>Changeable                  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Unchanging                               |
| i. | Is the cause(s) something for<br>which:<br>No one is responsible  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Someone is<br>responsible                |

4. Is the cause you have mentioned typical of this situation or can it also affect other aspect of your work:

Influences just this particular situation      1 2 3 4 5 6 7 8 9      Influences all situations in my work

5. How important would this situation be if it actually happened to you:

Not at all important      1 2 3 4 5 6 7 8 9      Extremely important

6. Do you feel responsible for the error:

Completely responsible      1 2 3 4 5 6 7 8 9      Not responsible all

7. What other factors do you feel contributed to the error

	Agree	Disagree
a. Lack of experience / training	1 2 3 4	5 6 7
b. Lack of ability	1 2 3 4	5 6 7
c. Lack of staff / resources	1 2 3 4	5 6 7
d. Stress	1 2 3 4	5 6 7
e. Nature of patient's condition	1 2 3 4	4 6 7

8. Tick your grade:

<b>D</b>	
<b>E</b>	
<b>F</b>	
<b>G</b>	
<b>H</b>	

9. How long have you been in nursing:

years

**THANK YOU**

*Appendix 6: Attribution study (error with non-serious outcome)*



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AND  
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Many thanks for your participation.

Yours sincerely,

Clency Meurier

Date:



1. Please try to vividly imagine yourself as having made the following error:

A patient had recently returned from surgery after a prostatectomy. You had done a post-operative check on the patient's condition and found him to be doing satisfactorily. However, you did not tape down the urinary catheter as was requested in the written post-operative instruction sheet. The untaped catheter was discovered by the surgeon when he came to check the patient on that day, and he reported the incident to you. The patient had suffered no ill-effect.

2. Give one major cause of the error:

.....  
 .....

3. Give below your impression of this cause:

- |    |   |   |   |   |   |   |   |   |   |   |                                       |
|----|---|---|---|---|---|---|---|---|---|---|---------------------------------------|
| a. | Is the cause(s) something that:<br>Reflects an aspect of yourself | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Reflects an aspect of situation       |
| b. | Is the cause(s):<br>Controllable by you or other people           | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Uncontrollable by you or other people |
| c. | Is the cause(s) something that is<br>Permanent                    | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Temporary                             |
| d. | Is the cause(s) something:<br>Intended by you or other people     | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Unintended by you or other people     |
| e. | Is the cause(s) something that is:<br>Outside of you              | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Inside of you                         |
| f. | Is the cause(s) something that is:<br>Variable over time          | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Stable over time                      |
| g. | Is the cause(s):<br>Something about you                           | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | Something about others                |
| h. | Is the cause(s) something that is:<br>Changeable                  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Unchanging                            |
| i. | Is the cause(s) something for<br>which:<br>No one is responsible  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Someone is responsible                |

*Appendix 6: Attribution study (error with non-serious outcome)*

4. Is the cause you have mentioned typical of this situation or can it also affect other aspect of your work:

Influences just this particular situation      1 2 3 4 5 6 7 8 9      Influences all situations in my work

5. How important would this situation be if it actually happened to you:

Not at all important      1 2 3 4 5 6 7 8 9      Extremely important

6. Do you feel responsible for the error:

Completely responsible      1 2 3 4 5 6 7 8 9      Not responsible all

7. What other factors do you feel contributed to the error

	Agree				Disagree		
a. Lack of experience / training	1	2	3	4	5	6	7
b. Lack of ability	1	2	3	4	5	6	7
c. Lack of staff / resources	1	2	3	4	5	6	7
d. Stress	1	2	3	4	5	6	7
e. Nature of patient's condition	1	2	3	4	4	6	7

8. Tick your grade:

<b>D</b>	
<b>E</b>	
<b>F</b>	
<b>G</b>	
<b>H</b>	

9. How long have you been in nursing:

years

**THANK YOU**



**CHEST PAIN : ANGINA - NURSING ASSESSMENT**  
 (Assessment to be completed fully within 24 hours of admission)

Surname	Other Name	D.O.B.	Status	Hospital No.	Consultant	Named Nurse
---------	------------	--------	--------	--------------	------------	-------------

**Activities of Living**

**HISTORY**

**OTHER**

Maintaining a Safe Environment

Characteristics of Pain:

Chest Pain - Yes  No  Central  Radiation of L/arm  R/arm  Jaw

Intensity: None -|-|-|-|-|-|-|-|-|-|-|- Very Severe

Medication Given on Admission: Analgesia  Nitrates  Thrombolysis  Other \_\_\_\_\_

History Details (including time pain started/activity at time/what relieved it or made it worse?)

\_\_\_\_\_

ECG taken  Comments \_\_\_\_\_

Cardiac enzymes  Weight \_\_\_\_\_ Other tests \_\_\_\_\_

Pulse \_\_\_\_\_ bpm Arrhythmia  Comments \_\_\_\_\_

BP \_\_/\_\_\_ Clammy  Resp. rate \_\_\_\_\_ per/min Cyanosis  Temp \_\_\_\_\_ oC

Comments \_\_\_\_\_

(If required) O<sub>2</sub> Saturation \_\_\_\_\_ Glucostix \_\_\_\_\_ Peak Flow \_\_\_\_\_

Name: \_\_\_\_\_

**CHEST PAIN: ANGINA**  
-  
**NURSING ASSESSMENT**

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Communicating	Anxious <input type="checkbox"/> Distressed <input type="checkbox"/> Comments _____
Breathing	Breathless <input type="checkbox"/> Wheeze <input type="checkbox"/> Comments _____ Heart Failure <input type="checkbox"/>
Eating/Drinking	Nauseated <input type="checkbox"/> Vomiting <input type="checkbox"/> IV <input type="checkbox"/> Normal Diet <input type="checkbox"/> Special diet _____ Fluid balance record : Yes <input type="checkbox"/> No <input type="checkbox"/> Other comments _____
Body Temperature	Normal <input type="checkbox"/> Abnormal <input type="checkbox"/> Comments _____
Personal Cleansing & Dressing	Obese <input type="checkbox"/> Oedema <input type="checkbox"/> Needs assistance with hygiene: Yes <input type="checkbox"/> No <input type="checkbox"/> Comments _____

Name: \_\_\_\_\_

**ANGINA-NURSING ASSESSMENT**

Mobilising

Pain on Activity  Breathless on Activity  Comments \_\_\_\_\_

Dizziness  Risk of Pressure Sores : High  Low  Waterlow Score

Working & Playing

Occupation \_\_\_\_\_ Retired  Smoker  No. per day \_\_\_\_

Alcohol  Social  Regular  Heavy

Other Activities \_\_\_\_\_

Expressing Sexuality

Married  Single  Divorced  Separated  Other \_\_\_\_\_

Sleeping

Normal  Poor  Comments \_\_\_\_\_

*Signature*

*Assessment Complete*   
*Incomplete*

*Date/Time*

*Reviewed*   
*Signature* \_\_\_\_\_  
*Date* \_\_\_\_\_

**CARE PATHWAY : ANGINA**

Name Hosp. No. Consultant		Day 1 CCU	Day 2	Day 3	Day 4	Day 5
Date						
Time						
Consultations	Physician CCU Team Cardiac Rehab	Arrange Transfer Cardiac rehab Therapist	Cardiac rehab therapist	Cardiac rehab therapist	Cardiac Rehab. Dietician if:- Cholesterol $\geq$ 5.2 Diabetic Overweight	
Tests	ECG prn CX R U+E's/C.E.s/FBC TPR/BP Fluid Chart O <sub>2</sub> Saturation Cardiac monitor	ECG prn U + Es C.E.'s Fluid chart Cardiac monitor Lipids TPR/BP	ECG Weight TPR/BP 4 hourly C.E's.	Weight TPR/BP BD	Stairs test TPR/BP OD	
Treatments	O <sub>2</sub> prn Venflon	Venflon OUT if not required				
Medications	Thrombolysis Aspirin IV nitrates prn analgesia diuretics prn Dopamine prn	Beta-blockers ACE Inhibitor (captopril/enalapril) Dopamine prn	As prescribed	TTOs for 7 days to include GTN	As prescribed	
Diet	As tolerated low Fat	Low fat	Low fat	Low fat	Low fat	
Activity	Bed rest Bed pan/commode Bedbath as tolerated Assisted Wash	Bed rest/commode. Sit up for varying periods as tolerated. Up to toilet, wheel to bath/shower as tolerated. Frequent rest period.	Increased frequency of sitting, short walks as tolerated. Independent walk/bath/shower if able. Rest periods.	Walk freely as tolerated Independent self-care (as tolerated). Assisted as required Rest periods.	Walk freely Independent self care Fully independent Stairs walk (with supervision)	
Teaching	Orientate to CCU Pain scale Breathing & Leg exercises Diagnosis	Booklet (to be given) Risk factors Convalescence	Booklet (discuss)	DISCUSSION Patient/partner, Activity levels, chest pain, home/work	REINFORCE previous advice CONFIRMED CHOLESTEROL LEVEL	
Discharge Planning	Initial Assessment	Preparation for transfer to ward (discontinue cardiac monitor if appropriate) Book follow-up OPD Book exercise test			O.P. Appt. Discharge Summary GP letter Provide drug info. sheets	
Signature						
Position						

NAME:

## ANGINA: CARE PLAN

Activity problem/need	Goal	Day 1	Day 2	Day 3	Day 4	Day 5
1. Teaching <i>knowledge deficit</i>	Patient & family have increased knowledge of IHD	Identify Risk factors & explain aetiology of MI/chest pain	Patient will participate in individual teaching plan	Orientation to wards	Assess patient's knowledge of the risk factors of IHD	Assess knowledge about dealing with chest pain. Identify any knowledge deficits. Reinforce advice in Booklet I&II
2. Emotional Support <i>anxiety</i>	Patient & family will feel supported	Explain Rationale for CCU. Patient & family will feel able to express their anxieties	Assess family support systems	Identify potential problems or worries. Support patient + Family		
3. Pain <i>potential for ischaemic pain</i>	Patient states pain scale 0/ free of pain	Instruct patient to state if any chest pain/discomfort. Teach pain scale. Monitor severity & record chest pain. Define nature of chest pain		12 lead ECG Provide Nitrates if BP allows/analgesia prn If persistent pain or ECG changes inform Dr.		
4. Nutrition <i>potential risk factors from diet</i>	i. Understand rationale for low fat diet.	Provide low fat diet as tolerated. Observe dietary intake		Low fat diet		
5. Elimination <i>i. potential for low urine output ii. potential for constipation</i>	Patient will perform normal daily process. Record abnormalities of urinalysis	Accurate fluid balance chart. Inform Dr if BP ↓ & oliguric	Record bowel function. Fluid balance chart	Record bowel function		
6. Hygiene <i>Inability to maintain normal hygiene pattern</i>	Patient should be as independent as condition allows	Bed bath (with assistance). Hands & face wash PRN	Assist as required	See Care Pathway (re activity)		
7. Observations <i>potential arrhythmias &amp; altered haemodynamic status</i>	Sinus rhythm rate < 100 BP ↑ 100 systolic. Patient warm & well perfused	Cardiac monitor 1 <sup>o</sup> BP+P 4 <sup>o</sup> BP+P 4 <sup>o</sup> Temp	4 hourly TPR/BP or more frequently if required	See Care Pathway Observe for side effect of medication and report to Dr.		
8. Mobilisation <i>enforced limited mobility</i>	Patient will be able to maintain activity level without problems	Assess & evaluate patient's progress. Inform Dr. of any complications		Assess and evaluate patient's progress. Inform Dr. of any complications		
9. Respiration <i>potential dyspnoea due to myocardial damage</i>	Resp. rate < 24 > Oxygen sat > 95% HR < 100 Wt. stable	Record resp rate 4 hourly Record oxygen sats PRN Fluid balance	Record resp. rate if required	Monitor breathing and report any problems		
10. Safety environment <i>potential side effects of SK infusion within 24 hrs.</i>	i. No major:- haemorrhage haematoma formation anaphylaxis hypotension	i. SK obs if appropriate Observe for phlebitis Patency of IV cannula ii. Assess whether carers at home are available	Check Venflon	Discharge Planning Ensure relatives feel confident and supported		
Other Problems	See separate care plan					
Signatures AM						
PM						
Nocte						

**VARIANCES**

Name:  
Hospital No:

DATE & DAY NO.	VARIANCE	REASON	ACTION	SIGNATURE

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**CHEST PAIN : MYOCARDIAL INFARCTION - NURSING ASSESSMENT**  
 (Assessment to be completed fully within 24 hours of admission)

Surname	Other Name	D.O.B.	Status	Hospital No.	Consultant	Named Nurse
---------	------------	--------	--------	--------------	------------	-------------

Activities of Living

HISTORY

OTHER

Maintaining a Safe Environment

Characteristics of Pain:

Chest Pain - Yes  No  Central  Radiation of L/arm  R/arm  Jaw

Intensity: None -|-|-|-|-|-|-|-|-|-|- Very Severe

Medication Given on Admission: Analgesia  Nitrates  Thrombolysis  Other \_\_\_\_\_

History Details (including time pain started/activity at time/what relieved it or made it worse?)

\_\_\_\_\_

ECG taken  Comments \_\_\_\_\_

Cardiac enzymes  Weight \_\_\_\_\_ Other tests \_\_\_\_\_

Pulse \_\_\_\_\_bpm Arrhythmia  Comments \_\_\_\_\_

BP \_\_\_/\_\_\_ Clammy  Resp. rate \_\_\_\_\_per/min Cyanosis  Temp \_\_\_\_\_oC

Comments \_\_\_\_\_

(If required) O<sub>2</sub> Saturation \_\_\_\_\_ Glucostix \_\_\_\_\_ Peak Flow \_\_\_\_\_



Name: \_\_\_\_\_

**CHEST PAIN:  
MYOCARDIAL INFARCTION -  
NURSING ASSESSMENT**

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Communicating

Anxious  Distressed  Comments \_\_\_\_\_

Breathing

Breathless  Wheeze  Comments \_\_\_\_\_

Heart Failure

Eating/Drinking

Nauseated  Vomiting  IV  Normal Diet  Special diet \_\_\_\_\_

Fluid balance record : Yes  No  Other comments \_\_\_\_\_

Body Temperature

Normal  Abnormal  Comments \_\_\_\_\_

Personal Cleansing &  
Dressing

Obese  Oedema  Needs assistance with hygiene: Yes  No

Comments \_\_\_\_\_

Name: \_\_\_\_\_

**ANGINA/MYOCARDIAL INFARCTION  
- NURSING ASSESSMENT**

Mobilising

Pain on Activity  Breathless on Activity  Comments \_\_\_\_\_

Dizziness  Risk of Pressure Sores : High  Low  Waterlow Score

Working & Playing

Occupation \_\_\_\_\_ Retired  Smoker  No. per day \_\_\_\_\_

Alcohol  Social  Regular  Heavy

Other Activities \_\_\_\_\_

Expressing Sexuality

Married  Single  Divorced  Separated  Other \_\_\_\_\_

Sleeping

Normal  Poor  Comments \_\_\_\_\_

*Signature*  
\_\_\_\_\_  
\_\_\_\_\_

*Assessment Complete*   
*Incomplete*

*Date/Time*  
\_\_\_\_\_  
\_\_\_\_\_

*Reviewed*   
*Signature* \_\_\_\_\_  
*Date* \_\_\_\_\_

**CARE PATHWAY : MYOCARDIAL INFARCTION**

Name Hosp. No. Consultant					
	Day 1 CCU	Day 2	Day 3	Day 4	Day 5
Date					
Time					
Consultations	Physician CCU Team Cardiac Rehab	Arrange Transfer Cardiac rehab Therapist	Cardiac rehab therapist	Cardiac rehab therapist	Cardiac Rehab. Dietician if:- Cholesterol $\geq$ 5.2 Diabetic Overweight
Tests	ECG prn CX R U+E's/C.E.s/FBC TPR/BP Fluid Chart O <sub>2</sub> Saturation Cardiac monitor	ECG prn U + Es C.E.'s Fluid chart Cardiac monitor Lipids TPR/BP	ECG Weight TPR/BP 4 hourly C.E.'s.	Weight TPR/BP BD	Stairs test TPR/BP OD
Treatments	O <sub>2</sub> prn Venflon	Venflon OUT if not required			
Medications	Thrombolysis Aspirin IV nitrates prn analgesia diuretics prn Dopamine prn	Beta-blockers ACE Inhibitor (captopril/enalapril) Dopamine prn	As prescribed	TTOs for 7 days to include GTN	As prescribed
Diet	As tolerated low Fat	Low fat	Low fat	Low fat	Low fat
Activity	Bed rest Bed pan/commode Bedbath as tolerated Assisted Wash	Bed rest/commode. Sit up for varying periods as tolerated. Up to toilet, wheel to bath/shower as tolerated. Frequent rest period.	Increased frequency of sitting, short walks as tolerated. Independent walk/bath/shower if able. Rest periods.	Walk freely as tolerated Independent self-care (as tolerated). Assisted as required Rest periods.	Walk freely Independent self care Fully independent Stairs walk (with supervision)
Teaching	Orientate to CCU Pain scale Breathing & Leg exercises Diagnosis	Booklet (to be given) Risk factors Convalescence	Booklet (discuss)	DISCUSSION Patient/partner, Activity levels, chest pain, home/work	REINFORCE previous advice CONFIRMED CHOLESTEROL LEVEL
Discharge Planning	Initial Assessment	Preparation for transfer to ward (discontinue cardiac monitor if appropriate) Book follow-up OPD Book exercise test			O.P. Appt. Discharge Summary GP letter Provide drug info. sheets
Signature					
Position					

NAME: \_\_\_\_\_ MYOCARDIAL INFARCTION - CARE PLAN

Activity problem/need	Goal	Day 1	Day 2	Day 3	Day 4	Day 5
1. Teaching <i>knowledge deficit</i>	Patient & family have increased knowledge of IHD	Identify Risk factors & explain aetiology of MI/chest pain	Patient will participate in individual teaching plan	Orientation to wards	Assess patient's knowledge of the risk factors of IHD	Assess knowledge about dealing with chest pain. Identify any knowledge deficits. Reinforce advice in Booklet I&II
2. Emotional Support <i>anxiety</i>	Patient & family will feel supported	Explain Rationale for CCU. Patient & family will feel able to express their anxieties	Assess family support systems	Identify potential problems or worries. Support patient + Family		
3. Pain <i>potential for ischaemic pain</i>	Patient states pain scale 0/ free of pain	Instruct patient to state if any chest pain/discomfort. Teach pain scale. Monitor severity & record chest pain. Define nature of chest pain	12 lead ECG Provide Nitrates if BP allows/analgesia prn If persistent pain or ECG changes inform Dr.			
4. Nutrition <i>potential risk factors from diet</i>	i. Understand rationale for low fat diet.	Provide low fat diet as tolerated. Observe dietary intake	Low fat diet			
5. Elimination <i>i. potential for low urine output ii. potential for constipation</i>	Patient will perform normal daily process. Record abnormalities of urinalysis	Accurate fluid balance chart. Inform Dr if BP ↓ & oliguric	Record bowel function. Fluid balance chart	Record bowel function		
6. Hygiene <i>Inability to maintain normal hygiene pattern</i>	Patient should be as independent as condition allows	Bed bath (with assistance). Hands & face wash PRN	Assist as required	See Care Pathway (re activity)		
7. Observations <i>potential arrhythmias &amp; altered haemodynamic status</i>	Sinus rhythm rate < 100 BP↑ 100 systolic. Patient warm & well perfused	Cardiac monitor 1° BP + P 4° BP + P 4° Temp	4 hourly TPR/BP or more frequently if required	See Care Pathway Observe for side effect of medication and report to Dr.		
8. Mobilisation <i>enforced limited mobility</i>	Patient will be able to maintain activity level without problems	Assess & evaluate patient's progress. Inform Dr. of any complications		Assess and evaluate patient's progress. Inform Dr. of any complications		
9. Respiration <i>potential dyspnoea due to myocardial damage</i>	Resp. rate < 24 > Oxygen sat > 95% HR < 100 Wt. stable	Record resp rate 4 hourly Record oxygen sats PRN Fluid balance	Record resp. rate if required	Monitor breathing and report any problems		
10. Safety environment <i>potential side effects of SK infusion within 24 hrs.</i>	i. No major:- haemorrhage haematoma formation anaphylaxis hypotension	i. SK obs if appropriate Observe for phlebitis Patency of IV cannula ii. Assess whether carers at home are available	Check Venflon	Discharge Planning Ensure relatives feel confident and supported		
Other Problems	See separate care plan					
Signatures AM						
PM						
Nocte						

VARIANCES

Name:  
Hospital No:

DATE & DAY NO.	VARIANCE	REASON	ACTION	SIGNATURE

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**Private and confidential : Please place in sealed envelope after completion.**  
**Chart Review : Assessment of Chest Pain/Myocardial infarction.**

Initials of Patient :..... Age :..... Sex :..(M) .(F) Ward :..... Date of Admission :.....Time :..... Date of Audit :..... Time :.....
--

Criteria	Met Fully	Met Partially	Not Met	*N/A	Comments *Justify N/A (not applicable)
1. The reason for admission is documented					
2. Previous medical history/admissions are recorded.					
3. Medication which the patient is currently taking is recorded on nursing assessment documentation.					
4. The history of onset of chest pain is documented.					
5. A detailed description of the nature of chest pain is noted.					
6. The intensity of chest pain is specified assessment documentation.					
7. Immediate measures to relieve the pain on admission is documented.					
8. Presence or absence of other associated problems (signs and symptoms) is recorded assessment documentation.					
9. Vital signs ( P, Bp , Resp. Temp.) are recorded in nursing assessment documentation.					

Please Turn Over.

*Appendix 7: Data sheets for chapters 11 & 12: Chart review*

Criteria	Met Fully	Met Partially	Not Met	*N/A	Comments * Justify N/A (not applicable)
<p>10. ECG is recorded as normal or abnormal in assessment documentation.</p> <p>11. Presence or absence of arrhythmia recorded on nursing assessment documentation.</p> <p>12. Weight of patient recorded in patient's nursing notes.</p> <p>13. Presence or absence of haemodynamic disturbance on admission (shock, Low Bp, Arrhythmia's) is documented.</p> <p>14. Psychological responses to chest pain/condition are documented.</p> <p>15. Knowledge of patient relating to his condition is recorded in the nursing assessment documentation.</p> <p>16. Smoking pattern is documented.</p> <p>17. Dietary habits recorded in assessment documentation.</p> <p>18. Drinking pattern is documented.</p> <p>19. Patients activity level (permitted exercises) for 1st two to three days is written in care plan.</p> <p>20. A summary of problems identified on assessment is listed in the nursing assessment documentation.</p>					



**Audit of Nursing Assessment Chart.**

**Guideline for completing the audit questionnaire.**

**Criteria.**

1. The reason for admission is documented.

Met fully	Full patient complaint described (e.g. chest pain + associated signs/symptoms)
Met partially	Only chest pain written down
Not met	No reason written down
N/A	State why not applicable

2. Previous medical history/admissions recorded.

Met fully	All previous medical history/admissions recorded in assessment documentation, including approximate year.
Met partially	Previous medical history/admissions written down, but approximate year of occurrence not given.
Not met	No record of previous medical history/admissions in assessment documentation
N/A	Please state why. e.g. 'none' is written in assessment documentation.

3. Medication which the patient is currently taking is recorded in nursing assessment documentation.

Met fully	All current medication which patient was taking immediately prior to admission are written down, with actual name of all the drugs given. e.g. Frusemide rather than diuretic
Met partially	Although current medication written down, actual name of all the drugs not given
Not met	No current medication is written down
N/A	Please state why. e.g. 'none' is written down

4. The history of the onset of chest pain documented.

Met fully	History fully described .e.g. * Previous chest pain * Frequency * What seems to have triggered it * What relieves it * Any current medical advice/treatment being followed (if any)
Met partially	History described only briefly. e.g. *Previous chest pain/MI *frequency of chest pain
Not met	Only chest pain noted (no history given)
N/A	Please give reason if using this option

5. A detailed description of nature of chest pain is noted.

Met fully	Full description given. e.g. *chest pain * location (? central) * any radiation * relieved or not relieved by rest.
Met partially	Limited description .e.g. * Chest pain * location (presence or absence of radiation not given)
Not met	Only chest pain written down
N/A	Please comment if using this option

6. The intensity of the chest pain is specified in assessment documentation.

Met fully	Pain fully described. e.g. Mild or severe * appropriate adjectives used (i.e. gripping, crushing, unbearable) * or a scale used
Met partially	Level of pain stated. e.g. *mild or severe *no other description given
Not met	Only chest pain mentioned
N/A	Please comment if this option is used

*Appendix 7: Data sheets for chapters 11 & 12: Chart review*

7. Immediate measures to relieve the pain on admission is documented.

Met fully	All drugs given on admission written down as well as their effects (i.e. whether relieved pain or not)
Met partially	Drugs to relieve pain on admission noted, but effects not described
Not met	No record of measures taken to relieve pain on admission
N/A	Please comment if not applicable

8. Presence or absence of other associated problems (signs and symptoms) is recorded in assessment documentation.

Met fully	Chest pain recorded as well as any other signs/symptoms (e.g. nausea, vomiting, dizziness). If no associated problems present, this is stated in the nursing documentation
Met partially	Chest pain recorded + partial reference to associated problems, but no specification of the exact nature of these problems
Not met	Only chest pain recorded
N/A	Please comment if this option is used

9. Vital Signs (P, BP, Resp./ Temp.) are recorded in nursing assessment documentation.

Met fully	All vital signs recorded in assessment documentation
Met partially	Only some vital signs recorded (i.e. two or more)
Not met	Only one or less vital sign recorded
N/A	Please give reason if this option is used

10. ECG is recorded as normal or abnormal in assessment documentation.

Met fully	ECG recorded in assessment documentation. Comment also made as whether it is normal or abnormal in the nursing assessment documentation.
Met partially	ECG recorded as having been taken
Not met	ECG not recorded in assessment documentation as having been taken

*Appendix 7: Data sheets for chapters 11 & 12: Chart review*

N/A	Please comment if this option is used
-----	---------------------------------------

11. Presence or absence of arrhythmia recorded in nursing assessment documentation.

Met fully	Arrhythmia as well as type recorded in assessment documentation .
Met partially	Only arrhythmia recorded in assessment documentation
Not met	No mention made as to whether or not arrhythmia is present.
N/A	Please comment if this option is used

12. Weight of patient recorded in patient's nursing notes.

Met fully	Weight taken and recorded. Comment also made whether the patient is overweight (obese) or not
Met partially	Weight taken and recorded, but no comment made.
Not met	Weight of patient not recorded
N/A	Please comment if this option is used

13. Presence or absence of haemodynamic disturbance on admission (shock, low BP, arrhythmia's) is documented.

Met fully	Full description given of presence or absence of shock, low Bp, clammy skin, cyanosis, arrhythmia , heart failure (dyspnoea)etc.
Met partially	Presence or absence of haemodynamic status commented on less than two important areas mentioned above
Not met	No mention is made in the nursing assessment documentation as to whether or not patient's chest pain/MI has affected his haemodynamic status.
N/A	Please comment if this option is used

14. Psychological responses to chest pain/ condition are documented.

Met fully	Type of psychological reaction as well as possible reason makes explicit
Met partially	Type of psychological reaction (e.g. anxiety) listed. Reason is not made explicit
Not met	No record of assessment of psychological state

Appendix 7: Data sheets for chapters 11 & 12: Chart review

N/A	Please comment if this option is used
-----	---------------------------------------

15. Knowledge of patient relating to his condition is recorded in the nursing assessment documentation.

Met fully	Patient actual understanding of reason for illness/admission described fully (e.g. heart attack, chest pain).
Met partially	Stated in assessment documentation that patient knows reason of admission, but not made explicit (e.g. chest pain, heart attack)
Not met	No record of assessment of patient's understanding of his condition.
N/A	Please comment if this option is used

16. Smoking pattern is documented.

Met fully	Full information on smoking pattern. How long a smoker. Previous smoking, but now stopped, how many cigarettes a day
Met Partially	Information written down about whether patient is a smoker or not, no other relevant detail given
Not met	No evidence of assessment
N/A	Please comment if this option is used

17. Dietary habits recorded in assessment documentation.

Met fully	Assessment include type of diet patient normally takes, including intake of potentially harmful food (e.g. animal fats)
Met partially	Assessment covers type of diet taken, but does not elaborate potentially harmful food
Not met	No evidence of assessment
N/A	Please comment if this option is used.

18. Drinking patterns documented.

Met fully	Frequency, approximate amount, types of drinks given.
Met partially	Only mention made to the effect that patient drinks or not
met	No evidence of assessment
N/A	Please comment if this option is used (patient is a teetotaler)

*Appendix 7: Data sheets for chapters 11 & 12: Chart review*

19. Patients activity level (permitted exercises) for 1st two to three days is written in care plan.

Met fully	Type of activity level allowed for first 2-3 days fully described in care plan (e.g. day 1 bed rest etc., day 2 sit out etc., day 3 walked round the bed etc.)
Met partially	Activity level permitted for first 2-3 days written down in care plan, but not made explicit what will happen each day
Not met	Permitted activity level either not written down in care plan or very vaguely written for only one day.
N/A	Please comment if this option is used

20. A summary of problems identified on assessment is listed in the nursing assessment documentation.

Met fully	Full list of problems listed at end of assessment documentation
Met partially	Only one problem (e.g. chest pain )is listed.
Not met	No problems are listed at the end of assessment documentation
N/A	Please comment if this option is used

**Private and Confidential.**

**Audit of Patient's Knowledge. ( Re. Chest Pain/Myocardial infarction).**

**Patient's Initials** :.....

**Date and time of admission** :.....

**Date and Time of Interview** :.....

**Ward** :.....**Diagnosis** : Myocardial infarction\_\_ Angina\_\_ (Please tick)

	Questions	Sources of information	Patient's Responses (Correct/incorrect)
1	What did the staff told you was wrong with you?	Diagnosis	
2	What type of physical activities are you allowed to do today?	Activities as indicated in care plan.	
3	What is a heart attack? /angina ? (ask as appropriate)	As defined in information leaflet.	
4	What factors may have contributed to your heart attack?/ angina ? (as appropriate)	Risk factors (from leaflet).	
5	How long do you think you will be in hospital?	Patient's notes	
6	What medications are you taking now?	List from drug chart.	
7	What are the medications for?		
8	What are the reasons for rest and graduated exercises?	Information in leaflet	
9	What things do you need to change in your life when you go home?	e.g. special diet, restrictions.	
10	Can you get similar illness again?		
11	What questions do you have that were not answered during your stay in hospital?	Patient's responses	

Please place in sealed envelope after completion.

**Chest Pain/Myocardial infarction.**

**Audit of patient's knowledge**

**Guideline for completing the form.**

Questions	Sources of information	Correct or incorrect
1. What did the staff told you was wrong with you?	Check diagnosis	Correct Response: Patient knows that he/she has had a myocardial infarction./ angina.  Incorrect Response : Patient does not know his diagnosis.
2. What type of physical activities are you allowed today?	Check care plan (or patient's leaflet) for today's activity programme	Correct Response : Patient's answers correspond to that in the care plan or leaflet.  Incorrect Response : Patient does not know (or is uncertain) of the specific activity he/she is allowed today
3. What is a heart attack?/ angina ( ask as appropriate to diagnostic category)	Check definition in information leaflet	Correct Response: Patient's definition corresponds to that of the leaflet or have the same meaning.  Incorrect Response : Patient cannot define a heart attack or definition deviates from established facts.
4. What factors may have attributed to your heart attact? or angina ? (as appropriate)	Check risk factors witten in leaflet	Correct Response : Patient mentions at least 3 risk factors  Incorrect Response: Patient can manage only two risk factors or less



*Appendix 7: Data sheets for chapters 11 & 12: Audit of patients' knowledge*

<p>5. How long do you think you will be in hospital?</p>	<p>Check patient's notes</p>	<p>Correct Response : Patient can state the exact number of days he will stay in hospital as normal for myocardial infarction or angina unless there is specific medical instruction that he/she will stay longer or lesser.</p> <p>Incorrect Response : Patient is unsure about the actual number of days he will stay in hospital.</p>
<p>6. What medications are you taking now?</p>	<p>Check medication chart.</p>	<p>Correct Response: Patient will be able to list all the oral/sublingual/spray medications he/she is currently taking.</p> <p>Incorrect Response: Patient cannot list or knows only partially the medications he/she is taking (N.B: Lay names for the medication is acceptable as correct)</p>
<p>7. What are the medications for ?</p>	<p>Compare patient's answers with that of leaflet regarding G.T.N . The patient will also be expected to have a lay man knowledge about 90 % of his other prescribed drugs.</p>	<p>Correct Response : Patient can tell what each medication he/she is taking is for.</p> <p>Incorrect Response: Patient doesn't know what the medications are for or has very limited knowledge.</p>

*Appendix 7: Data sheets for chapters 11 & 12: Audit of patients' knowledge*

<p>8. What are the reasons for rest and graduated exercise?</p>	<p>Compare answers with information in leaflet.</p>	<p>Correct Response : Patient knows that rest/graduated exercise is to allow heart to recuperate and to test his tolerance.</p> <p>Incorrect Response : Patient is vague about reasons for rest and graduated activity.</p>
<p>9. What things do you need to change in your life when you go home ?</p>	<p>Check the patient's response to 2-3 risk factors which are relevant to him/her</p>	<p>Correct Response: Patient can mention 2-3 risk factor which are relevant to his/her own personal situation.</p> <p>Incorrect Response : Patient cannot think about any risk factor or can list only one.</p>
<p>10. Can you get similar illness again ?</p>	<p>Patient's response reflects current knowledge.</p>	<p>Correct Response: Patient demonstrates awareness of the possibility of recurrence.</p> <p>Incorrect Response: Patient believes it is unlikely to get similar problem again.</p>
<p>11. What questions do you have that have not been answered so far?</p>	<p>Write down patient's response.</p>	<p>No correct or incorrect responses (all responses to be written down)</p>

**Confidential.**

**Ward:** \_\_\_\_\_

**Patient's Initials :** \_\_\_\_\_

**Date of Admission:** \_\_\_\_\_

**Time of Admission:** \_\_\_\_\_

**Diagnostic Code:** \_\_1\_\_ \_\_2\_\_

**Date of Audit :** \_\_\_\_\_

**Your Views Of Your Chest Pain And Its Control.**

**About These Questions:**

These Questions are about your experience of your chest pain, your response to it , and its management during your stay in hospital.
We would like you to think carefully about each question and answer it as honestly as you can.
The information that you give will not be used in any way that could identify you personally.
Your response will help us to continue to improve the care we give to our patients.

**Pain Questionnaire.**

A. Please rate your usual level of chest pain on each of the following pain descriptions by placing a tick in the relevant box :

Description	None	Mild	Moderate	Severe
Throbbing				
Shooting				
Stabbing				
Sharp				
Cramping				
Gnawing				
Hot-Burning				
Aching				
Heavy				
Tender				
Splitting				
Tiring-Exhausting				
Sickening				
Fearful				
Punishing-Cruel				

B. Please put a mark on the line that corresponds to your usual pain.

NO PAIN ----- WORST POSSIBLE PAIN

C. Please tick the word that most corresponds to your usual pain.

- 0 No pain -----
- 1 Mild - -----
- 2 Discomforting -----
- 3 Distressing -----
- 4. Horrible -----
- 5. Excruciating - -----

P.T.O

*Appendix 7: Data sheets for chapters 11 & 12: Evaluation of clinical indicators*

D. For each question circle the answer that is closest to what you think. 'Neutral' means you have no feelings either way.

1. I have always receive prompt attention from the nurses when I have chest pain.      Strongly Agree/ Agree/Neutral/Disagree/Strongly Disagree

2. I am very satisfied with the control of my chest pain.      Strongly Agree/ Agree/Neutral/Disagree/Strongly Disagree

3. I have not experienced any problems with my care and treatment.      Strongly Agree/ Agree/Neutral/Disagree/Strongly Disagree

4. I have received the best care for my chest pain.      Strongly Agree/ Agree/Neutral/Disagree/Strongly Disagree

5. I will follow the nurses advice because they are absolutely right.      Strongly Agree/ Agree/Neutral/Disagree/Strongly Disagree

**Please Turn Over.**

**BAI**

E .Below is a list of symptoms of anxiety. Please read carefully each item in the list. Indicate how much you have been bothered by each symptom since you have been admitted to hospital, INCLUDING TODAY, by placing an X in the corresponding space in the column next to each symptom.

<b>Symptoms</b>	<b>NOT AT ALL</b>	<b>MILDLY</b> It didn't bother me	<b>MODERATELY</b> It was very unpleasant but I could stand it	<b>SEVERELY</b> I could barely stand it
1. Numbness or tingling				
2. Feeling hot				
3. Wobbliness in legs				
4. Unable to relax				
5. Fear of the worst happening				
6. Dizzy or light-headed				
7. Heart pounding or racing				
8. Unsteady				
9. Terrified				
10. Nervous				
11. Feelings of choking				
12. Hands trembling				
13. Shaky				
14. Fear of losing control				
15. Difficulty in breathing				
16. Fear of dying				
17. Scared				
18. Indigestion or discomfort in the abdomen				
19. Faint				
20. Face flushed				
21. Sweating (not due to heat)				

**Thank you very much for filling in this questionnaire.**

- 1   ward
- 3  hospital
- 4    patient
- 7  time

CONFIDENTIAL

## YOUR VIEWS OF NURSING CARE

### ABOUT THESE QUESTIONS

These questions are about the nursing care you received during your stay in hospital. They ask about the care given to you by nurses and about your views of that care. Finally, they ask some questions about yourself.

We would like you to think carefully about each question and to answer it as honestly as you can. Don't spend too long on any question. Your first reaction will probably be better than a long thought-out answer. If you are unsure about how to reply to any question, please give the best answer you can and write your comments beside the question.

Your name and address does not appear anywhere on this booklet. The information that you give will not be used in any way that could identify you personally.

SECTION 1: YOUR EXPERIENCES OF NURSING CARE (EXAMPLE)

The first set of questions, starting on the next page, ask about your experiences of nursing based on your stay in this ward. The questions consist of a statement followed by seven possible responses. To answer the questions, please circle the number which best describes your experience. On the rest of this page we give two examples of how to answer the questions.

Example 1

If the nurses were always very quiet during the night, you would answer the question by circling number 7 - that means 'Agree completely'. Your answer would look like this.

Nurses were very quiet during the night

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

Example 2

If nurses were not smartly dressed, you could answer the question by circling number 6 - that means 'Agree a lot'. Your answer would look like this.

Nurses were not smartly dressed

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

If nurses were always smartly dressed, you could answer the question by circling number 1 - that means 'Disagree completely'. Your answer would look like this.

Nurses were not smartly dressed

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

If you are unsure about how to reply to any question, please give the best answer you can and write your comments beside the question.

**PLEASE TURN TO QUESTION 1**



SECTION 1: YOUR EXPERIENCES OF NURSING CARE

Please circle one response for each question

1. It was easy to have a laugh with the nurses.

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

2. Nurses favoured some patients over others.

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

3. Nurses did not tell me enough about my treatment.

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

4. Nurses were too easy going and laid back.

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

5. Nurses took a long time to come when they were called.

Agree completely	Agree a lot	Agree a little	Neither agree nor disagree	Disagree a little	Disagree a lot	Disagree completely
1	2	3	4	5	6	7

6. Nurses gave me information just when I needed it.

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

**PLEASE TURN TO QUESTION 7**

Please circle one response for each question

7. **Nurses did not seem to know what I was going through.**

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

8. **Nurses turned the lights off too late at night.**

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

9. **Nurses made me do things before I was ready.**

Agree completely	Agree a lot	Agree a little	Neither agree nor disagree	Disagree a little	Disagree a lot	Disagree completely
1	2	3	4	5	6	7

10. **No matter how busy nurses were, they made time for me.**

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

11. **I saw the nurses as friends.**

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

12. **Nurses spent time comforting patients who were upset.**

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

13. **Nurses checked regularly to make sure I was okay.**

Agree completely	Agree a lot	Agree a little	Neither agree nor disagree	Disagree a little	Disagree a lot	Disagree completely
1	2	3	4	5	6	7

Please circle one response for each question

14. Nurses let things get on top of them.

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

15. Nurses took no interest in me as a person.

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

16. Nurses explained what was wrong with me.

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

17. Nurses explained what they were going to do to me before they did it.

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

18. Nurses told the next shift what was happening with my care.

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

19. Nurses knew what to do without relying on doctors.

Agree completely	Agree a lot	Agree a little	Neither agree nor disagree	Disagree a little	Disagree a lot	Disagree completely
1	2	3	4	5	6	7

**PLEASE TURN TO QUESTION 20**

Please circle one response for each question

20. Nurses used to go away and forget what patients had asked for.

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

21. Nurses made sure that patients had privacy when they needed it.

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

22. Nurses had time to sit and talk to me.

Agree completely	Agree a lot	Agree a little	Neither agree nor disagree	Disagree a little	Disagree a lot	Disagree completely
1	2	3	4	5	6	7

23. Doctors and nurses worked well together as a team.

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

24. Nurses did not seem to know what each other was doing.

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

25. Nurses knew what to do for the best.

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

26. There was a happy atmosphere in the ward, thanks to the nurses.

Disagree completely	Disagree a lot	Disagree a little	Neither agree nor disagree	Agree a little	Agree a lot	Agree completely
1	2	3	4	5	6	7

## SECTION 2: YOUR OPINIONS OF NURSING CARE

**HOW TO ANSWER THESE QUESTIONS**

In this section, we ask your opinions of the nursing care you received during your stay on the ward. For each question, please circle one number which best describes your view.

Thinking about your stay on the ward, how did you feel about:

		Not at all satisfied	Barely satisfied	Quite satisfied	Very satisfied	Completely satisfied
1	The amount of time nurses spent with you	1	2	3	4	5
2	How capable nurses were at their job	1	2	3	4	5
3	There always being a nurse around if you needed one	1	2	3	4	5
4	The amount nurses knew about your care	1	2	3	4	5
5	How quickly nurses came when you called for them	1	2	3	4	5
6	The way the nurses made you feel at home	1	2	3	4	5
7	The amount of information nurses gave to you about your condition and treatment	1	2	3	4	5
8	How often nurses checked to see if you were okay	1	2	3	4	5
9	Nurses' helpfulness	1	2	3	4	5
10	The way nurses explained things to you	1	2	3	4	5
11	How nurses helped put your relatives' or friends' minds at rest	1	2	3	4	5
12	Nurses' manner in going about their work	1	2	3	4	5
13	The type of information nurses gave to you about your condition and treatment	1	2	3	4	5
14	Nurses' treatment of you as an individual	1	2	3	4	5
15	How nurses listened to your worries and concerns	1	2	3	4	5
16	The amount of freedom you were given on the ward	1	2	3	4	5
17	How willing nurses were to respond to your requests	1	2	3	4	5
18	The amount of privacy nurses gave you	1	2	3	4	5
19	Nurses' awareness of your needs	1	2	3	4	5

**PLEASE TURN TO SECTION 3 QUESTION 1**

## SECTION 3: QUESTIONS ABOUT YOURSELF

These questions are about you. To help us understand your answers to the other sets of questions, we need some information about the kind of person you are. If you are unsure about how to reply to any question, please give the best answer you can and write your comments beside the question.

1. Please indicate whether you are:

Please circle **one** number

Male	1
Female	2

2. How old are you?

Please write your age in years at your last birthday on the dashes below.

Age in years     \_ \_

3. We would like to know a little about your education.

Please circle **one** number

Are you still in full time education?	Yes	1
	No	2

At what age did you leave full-time education?

Please write age on the dashes below

Age on leaving full time education   \_ \_

4. Including last night, how many nights did you spend in **this ward on this occasion?**

Please write the number of nights on the dashes below

Number of nights   \_ \_

5. Was there one particular nurse in charge of your care in this ward?

Please circle **one** number only

Yes	1
No	2
Not sure	3

6. How would you rate the nursing care you received in this ward?

Dreadful	Very poor	Poor	Fair	Good	Very good	Excellent
1	2	3	4	5	6	7

7. Overall how would you rate your recent stay in this ward?

Dreadful	Very poor	Poor	Fair	Good	Very good	Excellent
1	2	3	4	5	6	7

8. Are there any ways in which the nursing care could have been improved during your current stay in hospital?

.....

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.....

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9. Are there any other comments you would like to make?

.....

.....

.....

.....

.....

**PLEASE TURN TO NEXT PAGE**

Today's date      day    month    year  
                                  

THANK YOU FOR YOUR KIND ASSISTANCE

Please put your completed questionnaire in the envelope provided and seal it. Please put the envelope in the box situated at the Nurses' Station. All information will be treated with the strictest of confidence.