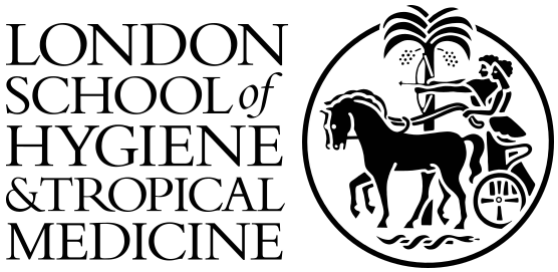

General practitioner referrals to one-stop clinics for symptoms that could be indicative of cancer: a systematic review of use and clinical outcomes.

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Summary

Background. One-stop clinics provide comprehensive diagnostic testing in one outpatient appointment. They could benefit patients with conditions, such as cancer, whose outcomes are improved by early diagnosis, and bring efficiency savings for health systems.

Objective. To assess the use and outcomes of one-stop clinics for symptoms where cancer is a possible diagnosis.

Design and setting. Systematic review of studies reporting use and outcomes of one-stop clinics in primary care patients.

Method. We searched MEDLINE, Embase, and Cochrane Library for studies assessing one-stop clinics for adults referred after presenting to primary care with any symptom that could be indicative of cancer. Study selection was carried out independently in duplicate with disagreements resolved through discussion.

Results. Twenty-nine studies were identified, most were conducted in the UK and observational in design. Few included a comparison arm. A pooled comparison of the cancer conversion rate of one-stop and multi-stop clinics was only possible for breast symptoms, and we found no significant difference. One-stop clinics were associated with significant reductions in the interval from referral to testing (15 versus 75 days) and more patients diagnosed on the same day (79% versus 25%) compared to multi-stop pathways. The majority of patients and GPs found one-stop clinics to be acceptable.

Conclusion. This review found one-stop clinics were associated with reduced time from referral to testing, increased same day diagnoses, and were acceptable to patients and GPs. Our conclusions are limited by high levels of heterogeneity, scarcity of comparator groups, and the overwhelmingly observational nature of included studies.

Background

General Practitioners (GPs) see fewer than eight new cases of cancer each year, yet many more patients consult their GP with symptoms that could be indicative of cancer.[1] In some circumstances, GPs may refer patients to 'one-stop clinics' to investigate the cause of the symptoms during a single outpatient appointment. One-stop clinics are equipped and staffed so that patients may undergo a range of tests carried out at the same location, have their results reviewed by specialists, receive a diagnosis and, in some cases, have treatment on the same day without referral back to the GP.[2] One-stop clinics are often arranged by symptom and specialty, for example one-stop breast lump clinic or urology clinic.

The rationale behind a one-stop service is that the efficiency of carrying out all tests in a single appointment and having the results reviewed immediately by a consultant could speed up the diagnostic process, potentially benefitting patients and creating cost savings for the health system.[2] This reasoning appears sound as it has been reported that cancer patients can undergo multiple investigations at the request of multiple clinicians before receiving treatment, adding complexity, time, and cost to the diagnostic process.[3] Furthermore this model of care could have a positive impact on patient outcomes as when patients are able to access treatment more quickly their satisfaction with the diagnostic process increases and distress is reduced.[4,5] Despite this, some authors have cautioned that the time saved may not benefit all patients, particularly if further tests or imaging are required to confirm a diagnosis.[6]

Objectives

To our knowledge there has been no published systematic review to summarise the evidence for one-stop clinics for the investigation of symptoms that could be indicative of cancer, and so we set out to review the evidence for the use of one-stop clinics. We report the proportion of patients diagnosed with cancer or other conditions (the conversion rate) and where possible indications for referral, time to testing, appropriateness, other conditions diagnosed, and acceptability to GPs and patients. We include direct comparisons with outcomes in patients in the same population referred to multi-stop pathways where available.

Methods

Search

We registered the systematic review protocol with PROSPERO[7] and searched the following electronic databases: MEDLINE, Embase, and the Cochrane Library. The search strategy as reported in Supplementary table S1 was adapted for each individual database. Our search strategy was purposefully kept broad and included terms describing other diagnostic strategies such as direct access and fast track testing. This was done to avoid missing relevant papers because of differences in terminology, and with a view to summarising the literature for the other diagnostic strategies which has been reported elsewhere.[8]

We included studies describing adults (aged ≥18 years) attending primary care and undergoing one-stop testing for symptoms where cancer diagnosis was a possibility. One-stop clinics were defined as clinics accepting referrals from a GP without first consulting a specialist, where all the necessary tests for a diagnosis were available on the same day. Some studies included 'multi-stop' pathway patients as a comparison group. These patients were referred for tests that required multiple clinic appointments. Restrictions were not placed on the location of the clinics, nor were clinics excluded if their stated aim was something other than cancer detection provided cancer diagnosis was a possibility from the symptoms investigated. In addition, reference lists of identified reviews and all included studies were checked for studies meeting our inclusion criteria. Finally a 'related article' search was performed in PubMed on all included studies. No time or language limits were placed on the searches.

Study Selection and Data Extraction

Retrieved articles were title and abstract screened independently by two reviewers (CFS, AT) and any disagreements were resolved through discussion with a third reviewer (BN). The included papers were independently read in full by the same two reviewers and disagreements regarding the inclusion of papers were resolved through discussion. Four initial screening questions were used for each paper, which had to be answered in the affirmative for the paper to be included: 1. One-stop testing confirmed? 2. No specialist triage of referrals? 3. GP one-stop referral outcome data reported separately? 4. Cancer diagnosis possible? Data from retained studies was extracted by two independent reviewers (CFS, GH) into a pre-prepared Excel spreadsheet. The data extraction of the

two reviewers was compared, and if necessary, any disagreements were resolved by a third reviewer (BN).

Quality assessment

The risk of bias and quality of the studies was assessed using the Newcastle-Ottawa tool to review cohort studies and a modified version for cross-sectional studies, and the Cochrane Risk of Bias tool to assess the risk of bias in randomised controlled trials.[9-11] The results of the quality assessment are used for descriptive purposes, to provide an overall assessment of the quality of the included studies and no studies were excluded based on quality alone.

Analysis

We had two primary outcomes of interest. Firstly, the number of cancers diagnosed at a one-stop clinic or multi-stop pathway, recorded as an absolute number and expressed as a cancer conversion rate (CR). The CR is the number of patients receiving a cancer diagnosis expressed as a proportion of all patients attending the clinic. Secondly, the non-cancer diagnoses (with corresponding CR). Secondary outcomes of interest were indications for referral, time to diagnosis, the appropriateness of referrals, and measures of patient and clinician acceptability.

CRs were calculated for cancer and non-cancer diagnoses for each study, grouped by indication/symptom type, and pooled to give a CR for each indication. Pooled estimates were calculated for the CR for each indication; investigated at one-stop clinics or multi-stop pathways where appropriate, using the metaprop command in Stata weighted using the Freeman-Tukey double arcsine transformation to allow for variation in sample sizes.[12,13] A Wilcoxon-Mann-Whitney test was used to investigate whether one-stop clinics reduced the interval from referral to testing, from referral to diagnosis, and whether more patients referred to one-stop clinics received their diagnosis on the same day. In addition, a narrative review of GP and patient acceptability was conducted.

Results

The PRISMA flow diagram in Figure 1 outlines the selection of the 29 papers included in the review. Table 1 presents a list of the included papers.

[Figure 1 about here]

[Table 1 about here]

The included papers were published between 1998 and 2016, and all were observational studies with the exception of two randomised-controlled trials.[14,15] Twenty-five of the studies were carried out in clinics based in the UK, two in Australia,[16,17] and one each from Ireland[18] and Singapore.[19] All studies were focussed on a specific set of symptoms or specialty i.e. there were no clinics that accepted referrals where there was a general suspicion of cancer. The indications for referral included: seven studies on post-menopausal or abnormal vaginal bleeding,[20-26] six studies on breast symptoms,[14,15,27-30] three for lower gastrointestinal (GI) symptoms,[16,31,32] three for elevated prostate specific antigen (PSA),[17,18,33] three for testicular symptoms,[34-36] two for urological symptoms,[37,38] two for dyspepsia,[39,40] one for haematuria,[19] one for unexplained lymphadenopathy,[41] and one for neck lumps.[6] When reported, one-stop clinics were held in a hospital setting.

Quality assessment

The majority of studies (90%) included a representative sample of consecutive patients. The overall study quality was poor: most (90%) assessed patient outcomes through retrospective review of clinical record data and 90% presented a descriptive analysis only without including a comparator group. Only the two randomised controlled trials justified their sample sizes, but neither was blinded. One of the randomised controlled trials was judged to be at low risk of bias,[14] while the other at moderate risk of bias due to missing detail in the paper, suboptimal methods of allocation concealment, and attrition of participants with characteristics that may have introduced bias.[15] See Supplementary tables S2 – S4 for full details.

Diagnoses by symptom type

The cancer CR ranged from 1.7% (95% confidence interval (CI) 0.5-3.5%) for lower GI symptoms (3 studies) to 42.8% (CI 28.5-57.7%) for elevated PSA (3 studies) (Table 2). Only three studies presented comparator data from patients referred to multi-stop pathways: one for abnormal vaginal bleeding and two for breast symptoms.[14,15,24] No significant difference was found in the cancer CR between one-stop and multi-stop pathways for breast symptoms (p=0.28) (Table 2).

Sixty-six percent of the included studies reported non-cancer diagnoses: the non-cancer CR in one-stop clinics ranged from 30.3% (CI 17.0 – 45.5%) for abnormal vaginal bleeding (5 studies) to 82.1%

(CI 61.8 – 95.8%) for lower GI symptoms (3 studies). Two studies reported the number of non-cancer diagnoses made in comparator arms: one investigating abnormal vaginal bleeding and the other breast symptoms.[14,24] In both cases the non-cancer CR was higher in the one-stop clinic, however these differences arise from comparing the pooled analysis of one-stop clinics to single studies describing the outcomes of a multi-stop comparator clinic and so should be viewed with caution.

[Table 2 about here]

For a full breakdown of all cancer and non-cancer diagnoses CRs see Supplementary tables S5 – S12.

Time to testing and diagnosis

One-stop clinics were associated with a significant reduction in the waiting time between referral and clinic appointment from a mean of 75 days (standard deviation (SD) 47 days) in multi-stop pathways (4 studies) to 15 days (SD 7 days) in one-stop clinics (9 studies) (r=2.78, p=0.005). Only one study reported the change in diagnostic interval and found a significant decrease from usual care clinics (28 days) associated with the one-stop clinic (15 days, p=0.004).[37] Significantly more patients referred to one-stop clinics (79.2%) compared to multi-stop clinics (24.7%) were also diagnosed on the same day (r=-1.95, p=0.05) (14 studies).

Appropriateness of referral to one-stop clinic

Three studies reported the eligibility of patients and the appropriateness of referrals to one-stop clinics.[14,30,39] Two reported that 3% of the patients referred were excluded because they were deemed to be ineligible based on clinician judgement[14,39] without giving further detail, and the third reported that 34% of patients attending the one-stop breast clinic were referred inappropriately according to UK NHS guidelines.[30] None of the included studies examined the appropriateness of referrals to one-stop clinics relative to usual care clinics.

Acceptability of one-stop clinics

Acceptability to patients was assessed in nine studies. Over 87% of patients were either satisfied or very satisfied with the service provided by one-stop clinics,[22,32,33,41] or felt that it had been a *"helpful"*[40] experience. In a qualitative evaluation, a one-stop menstrual clinic was rated higher than usual care on provision of information, continuity of care, waiting time for an appointment, clinic organisation,

explanation of tests, and provision of results.[26] Eighty-three percent of patients in another study felt that having all of their tests on one day was *"of benefit"*,[39] however this study also reported that fewer patients regarded their management in the one-stop dyspepsia clinic as satisfactory compared to those seen in the usual care clinic.

One-stop breast clinics were also found to significantly reduce patient anxiety in the period immediately after their appointment, but this disappeared in the longer term.[14,15] One study reported that women who had received a quicker (one-stop) diagnosis of breast cancer reported higher levels of anxiety than those who had been diagnosed over two appointments, but this difference was not statistically significant.[15] A significant difference was found eight weeks later, when women diagnosed with cancer in the one-stop clinic reported higher levels of depression than those diagnosed in a two-stop clinic.

Three papers assessed GPs views on the acceptability of one-stop clinics. In one study GPs rated the one-stop urology clinic as a 9/10 in terms of the quality of service and information provided, and the resolution of their patients' presenting symptoms, and 7/10 in terms of accessibility.[33] In another study, 88% of GPs said they were satisfied and would use the one-stop lymph node clinic again.[41] In the third study, 91% of GPs rated the clinic as "good" or "very good", and 84% said they preferred the one-stop clinic for the management of patients with dyspepsia while only 11% said they preferred direct access endoscopy.[40]

Finally, one study reported that when patients were reassured by all tests being negative in the usual care multi-stop clinic, they were significantly more likely to have further clinic attendance than those reassured in the one-stop clinic (54.4% versus 44.4%, p=0.0005).[15]

Discussion

In this systematic review and meta-analysis we aimed to summarise the current evidence for one-stop clinics for the investigation of patients from primary care with symptoms that could be indicative of cancer. The cancer CR ranged from 1.7-42.8% and the non-cancer CR ranged from 30.3-82.1%, depending on indication(s) for referral. The studies comparing one-stop and multi-stop pathways reported similar CRs with significantly shorter intervals from referral to testing associated with one-stop clinics. Significantly more patients received a diagnosis on the same day and significantly fewer

patients required additional clinic appointments after attending a one-stop clinic. Patient and GP satisfaction was found to be generally high, and the reported adverse effects of one-stop clinics were either statistically non-significant or of little clinical significance.[42]

Strengths and weaknesses

To our knowledge this is the first systematic review to summarise the evidence for one-stop clinics. We performed a comprehensive search and applied strict selection criteria to ensure that we only included studies examining the outcomes of one-stop clinics in patients referred from primary care. The majority of studies were, however, judged to be of poor quality: most were descriptive retrospective audits limiting external validity, and very few studies included a comparator group. As a result, we felt that making firm conclusions about the diagnostic performance of one-stop pathways in relation to multi-stop pathways would be inappropriate. Furthermore, all of the included one-stop clinics focused on individual symptoms or specialties, e.g. lower GI symptoms or urology clinic, but all patients attending these clinics may not have had the same symptoms. For example, some clinics which investigated abnormal vaginal bleeding included women with post-menopausal bleeding only, while others included a range of symptoms from irregular menstruation to post-coital bleeding: symptoms which carry different positive predictive values for cancer and indicate heterogeneity within the study populations.

Comparison with the literature

Although high quality studies examining one-stop clinics are rare, this is just one of a number of diagnostic testing pathways that are being explored. As well as one-stop clinics, direct access testing is being studied as a route where GPs may refer a patient for a specific diagnostic test, for example CT scan or MRI, without the need to refer to or consult with a specialist with the aim of speeding up access to testing.[43] A recent systematic review reported that like one-stop clinics, direct access clinics were associated with a reduction in time from referral to testing.[8] Unlike one-stop clinics, however, there was no significant reduction in time from referral to diagnosis. This review also found that the cancer and non-cancer CRs for direct access clinics were similar to those of usual care clinics, and GPs and patients rated their performance highly.

Another route to testing where there is a small but growing body of literature is multi-disciplinary centres (MDCs). MDCs are similar to one-stop clinics in that the patient is provided with all the

necessary tests and consultations for a diagnosis at the same centre. Unlike one-stop clinics, however, MDCs tend not to be focussed on specific specialties instead investigating a range of, often non-specific, symptoms. MDCs may also require the GP to have ordered certain tests, for example blood tests or even some diagnostic imaging, before referral to the MDC is accepted. Despite these differences, the aim of both one-stop clinics and MDCs to provide a comprehensive range of tests in one centre warrants comparisons between their outcomes. The Danish non-specific symptoms and signs of cancer patient pathway (NSSC-CPP) and the pathways under investigation by Cancer Research UK's Accelerate Coordinate and Evaluate (ACE) program are examples of MDCs at different stages of implementation and assessment.[44,45] The NSSC-CPP has reported a cancer CR of 16% in 1278 patients referred to the pathway which is within the range of cancer CRs reported by one-stop clinic studies included in this review even without the preliminary GP ordered tests.[46] Furthermore, the introduction of cancer pathways such as the NSSC-CPP have resulted in a significant reduction in waiting times for patients across a range of cancer types.[47] We too found that one-stop clinics could significantly reduce the time from GP referral to clinic appointment, with an average waiting time of 15 days, just outside the 14 day target set by the Independent Cancer Taskforce.[1]

Implications for research and practice

The decrease in time from GP referral to testing, and the comparable cancer CRs between one-stop and multi-stop clinics, provide some evidence in support of the use of one-stop clinics. This evidence, however, needs to be strengthened so that appropriate comparisons and evidence-based conclusions can be reached about the relative effectiveness of one-stop and multi-stop clinics. Approaches which remove the need for patients to attend multiple appointments in order to receive a diagnosis have recently been championed in recommendations for cancer research.[1] One-stop clinics investigating specific, often 'red flag' symptoms and MDCs investigating non-specific symptoms both fulfil these recommendations.[44,48] Despite the savings that may occur from a reduced number of consultations, there have been reports that the staff requirements of one-stop clinics can result in higher costs.[14] Currently, due to the paucity of studies that compare the costs and outcomes of one-stop clinics to a multi-stop diagnostic process, it is not possible to determine whether these costs outweigh the benefits.

In addition, although we have shown that one-stop clinics are associated with reduced time from GP referral to testing and diagnosis, it is still unknown whether one-stop clinics are associated with earlier cancer stage at diagnosis or increased survival. None of the studies included in this review discussed the clinics' impact on the stage at which cancer diagnoses were made. NHS England has recently allocated £200 million to achieving faster and earlier cancer diagnosis[49] as part of its strategy to meet the Independent Cancer Taskforce's goal of 57% of cancer patients surviving 10 years and 75% surviving one year by 2020.[1] One-stop clinics could be a valuable tool in achieving this goal, but with the lack of studies examining stage of diagnosis we only have part of the evidence needed to determine whether they could have a role to play.

The gaps in the evidence should be addressed by studies heeding the shortcomings of previous research in this field. The studies that we assessed to be of higher quality were those that described a randomised trial rather than observational design,[14] provided a full account of the patients that entered the study,[14,17,23,30,36] and justified the statistical methods used.[37] These are only a small proportion of the studies included in this review and this highlights the need for more, high quality studies that make use of prospective designs, randomisation of patients to one-stop and comparator groups, and rely less on clinical records data not collected for the purposes of the study.

The overwhelming majority of studies concluded that one-stop clinics were a patient-centred, efficient route to diagnosis. There was less agreement about how one-stop clinics should be delivered. Some authors suggested cost savings could be made by using existing resources rather than investing in new facilities.[37] Contrary to this, others stated that the difficulties which arose from patients having to navigate the hospital to attend different investigations meant that restructuring was necessary so that investigation, consultation, and administration could be carried out side by side.[38] While a third group of authors felt that diagnostic tests should be performed away from the consultation to prevent the test being seen as inevitable and to emphasise the importance of the consultation.[40] Initial difficulties running one-stop clinics settled over time and clinicians were able to see as many patients as they had previously in the multi-stop clinic.[15] As one-stop clinics produced similar diagnosis rates to multi-stop clinics or screening programmes, without increasing demands on resources or increasing diagnostic errors[15,29], it seems unlikely that one-stop clinics will place extra demands on the clinical teams who will treat the detected cancers but rather that they may ease demand if it can be shown

that cancers are detected at an earlier, more treatable stage. This is a hypothesis that should be addressed in future research.

If one stop clinics encourage referral of patients who would not have been referred to standard multi-step pathways, then there is a potential risk of overdiagnosis of cancer – diagnosis of a cancer that would not have caused harm during a patient's lifetime. Overdiagnosis of cancer is most commonly described in the context of screening but it is possible to diagnose cancer in patients with symptoms from another cause, especially when lower risk patients are tested.[50] Based on the findings of this review we are unable to comment on the risk of overdiagnosis in one-stop clinics: only one study reported patients diagnosed with asymptomatic breast cancer and most also had symptomatic breast cancer.[29] Some authors considered the CR's for cancer and serious disease to be too low[30,39] whilst others concluded that testing more patients to reduce the risk of under-diagnosis was important.[19,37] GPs will play a vital role in minimising inappropriate referrals to achieve a balance between under- and overdiagnosis.

Conclusion

In conclusion, this study provides a first review of the literature on one-stop clinics to investigate symptoms that could be indicative of cancer. Streamlining services in the NHS, which is beset with financial difficulties and ever-growing demands on resources, is an intuitive strategy to begin tackling these issues. This is especially pertinent for conditions such as cancer with patients benefitting from expedited diagnosis. The shortened time from referral to test and higher numbers of patients receiving their diagnosis on the same day are efficiency savings that we have shown to be possible with one-stop clinics and these provide evidence in support of their continued use and increased rigorous assessment.

Declarations

As this paper is a systematic review of published literature, no ethical approval is required. The authors received no funding for the production of this review and declare no conflicts of interest. CFS is funded through a grant from Cancer Research UK. BDN, AT and CB designed the protocol for this review. CFS, AT and BDN carried out the screening of the papers, CFS and GAH extracted the data from the included papers. CFS carried out the statistical analyses. BDN, DL and FG provided clinical

expertise and interpretation. CFS wrote the first draft of the paper and BDN edited it. All authors reviewed, edited, and approved the final manuscript.

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Figures

Figure 1. PRISMA diagram – studies included and excluded

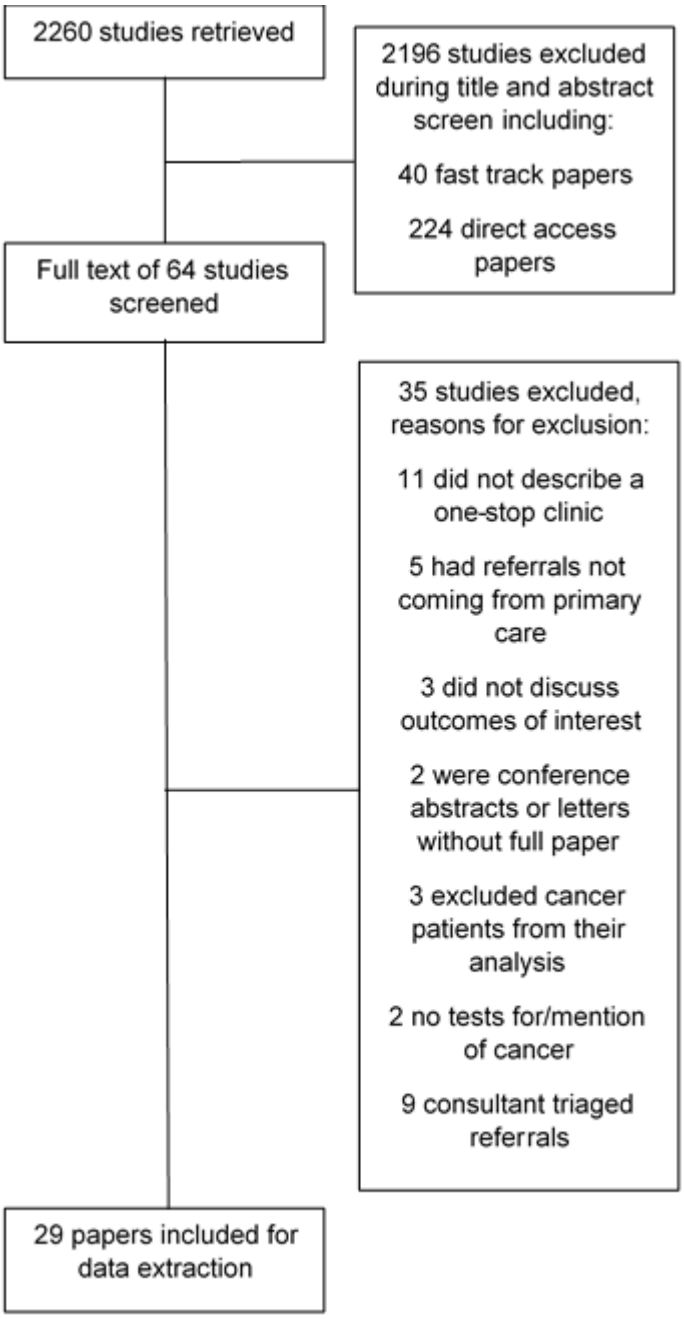

Figure 1. PRISMA diagram – studies included and excluded

Table 1. Characteristics of the papers included in systematic review of GP referrals to one-stop clinics (1998 – 2016): First author and reference, country, study design, participant selection, indication(s) for referral, total patients, number of patients in one-stop group, number of patients in comparator group.
(GI: gastrointestinal; PSA: prostate specific antigen)

First author and reference	Country study conducted	Study design	Participant selection	Indication(s) for one-stop clinic referral	Number patients included (Total N)	One-stop group (n)	Comparator group (n)
Abu (2001) [26]	UK	Cohort	Consecutive	Abnormal vaginal bleeding	239	113	126
Agaba (2006) [31]	UK	Cross-sectional	Consecutive	Lower GI symptoms	250	250	-
Al Hamarneh (2013) [6]	UK	Cohort	Consecutive	Neck lump	333	333	-
Barrass (2013) [37]	UK	Cross-sectional	Consecutive	Urological	200	100	100
Britton (2009) [27]	UK	Cross-sectional	Consecutive	Breast symptoms	7613	7613	-
Coull (2009) [38]	UK	Cross-sectional	Consecutive	Urological	257	257	-
Dey (2002) [14]	UK	Randomised controlled trial	All patients in the time period	Breast symptoms	478	267	211
Eltahir (1999) [28]	UK	Cohort	Consecutive	Breast symptoms	1110	1110	-
Forde (2011) [18]	Ireland	Cohort	Consecutive	Elevated PSA	215	215	-
Gregory (2000) [41]	UK	Cross-sectional	Consecutive	Enlarged lymph node	82	82	-
Harcourt (1998) [15]	UK	Randomised controlled trial	Consecutive	Breast symptoms	791	416	375
Jones (2001) [20]	UK	Cross-sectional	Consecutive	Abnormal vaginal bleeding	93	93	-
Lee (2007) [16]	Australia	Cross-sectional	Consecutive	Lower GI symptoms	1529	1529	-
Lotfallah (2005) [21]	UK	Cross-sectional	Consecutive	Abnormal vaginal bleeding	308	308	-
McCombie (2015) [17]	Australia	Cohort	Consecutive	Elevated PSA	200	200	-
Mehrotra (2011) [29]	UK	Cross-sectional	All patients with breast cancer	Breast symptoms	4400	4400	-
Melleney (2002) [39]	UK	Cross-sectional	Consecutive	Dyspepsia	100	100	-
Mohamed (2003) [22]	UK	Cross-sectional	Consecutive	Abnormal vaginal bleeding	80	80	-
Moore (2009) [34]	UK	Cross-sectional	Consecutive	Testicular symptoms	845	845	-
Muthuveloe (2016) [35]	UK	Cross-sectional	Consecutive	Testicular symptoms	1757	1757	-
Panda (2002) [23]	UK	Cohort	Consecutive	Abnormal vaginal bleeding	522	522	-
Patel (2000) [30]	UK	Cohort	Consecutive	Breast symptoms	321	321	-
Rochester (2008) [36]	UK	Cohort	Consecutive	Testicular symptoms	1017	1017	-
Rutter (1998) [40]	UK	Cross-sectional	Consecutive	Dyspepsia	362	362	-
Shah (2016) [33]	UK	Cohort	Consecutive	Elevated PSA	729	729	-
Sulaiman (2004) [24]	UK	Cohort	Consecutive	Abnormal vaginal bleeding	146	95	51
Tan (1998) [19]	Singapore	Cross-sectional	Consecutive	Haematuria	113	113	-
Toomey (1998) [32]	UK	Cohort	Consecutive	Lower GI symptoms	344	344	-
Yakasai (2011) [25]	UK	Cross-sectional	Consecutive	Abnormal vaginal bleeding	753	753	-

Table 2. Cancer and non-cancer conversion rates by indication for referral in adult patients referred to a one-stop clinic with symptoms that could be indicative of cancer

Indication for One-Stop referral		Conversion Rates					
		Cancer			Non-cancer diagnoses		
		Studies (N)	Range (%)	Pooled % (95% CI)	Studies (N)	Range %	Pooled % (95% CI)
Abnormal vaginal bleeding	One-stop	6	1.3 – 5.2	3.7 (2.7 – 4.9)	5	4.2 – 58.1	30.3 (17.0 – 45.5)
	Multi-stop	1	5.9	-	1	17.7	-
Breast symptoms	One-stop	6	5.3 – 16.1	8.5 (6.8 – 10.4)	2	68.9 – 90.0	81.5 (78.3 – 84.6)
	Multi-stop	2	9.1 – 12.3	10.2 (7.8 – 12.8)*	1	64.5	-
Lower gastrointestinal symptoms		3	0.9 – 3.2	1.7 (0.5-3.5)	3	59.2 – 96.8	82.1 (61.8 – 95.8)
Elevated PSA		3	31.1 – 55.5	42.8 (28.5-57.7)	1	24	-
Haematuria		1	14.2	-	1	28.3	-
Enlarged lymph node		1	19.5	-	1	80.5	-
Neck lump		1	16.2	-	1	64.3	-
Testicular symptoms		3	1.0 – 5.6	3.2 (0.9 – 6.7)	3	15.0 – 75.7	49.5 (14.0 – 85.4)
Upper gastrointestinal symptoms		2	3.3 – 7	3.9 (2.3 – 5.9)	2	41.2 – 72.0	48.2 (43.6-52.7)

*p=0.28