

Report for the National Awareness and Early Diagnosis Initiative

Cancer in Primary Care

AN ANALYSIS OF SIGNIFICANT EVENT
AUDITS (SEA) FOR DIAGNOSIS OF LUNG
CANCER AND CANCERS IN TEENAGERS
AND YOUNG ADULTS
2008 – 2009



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1. EXECUTIVE SUMMARY

Background

The principal method of identification of cancer in the UK is symptomatic presentation, usually to general practitioners (GPs), who as a result of their gate-keeping role within the NHS are the usual source of referral to secondary care. As part of the National Awareness and Early Diagnosis Initiative (NAEDI) to promote timely diagnosis of cancer, a national audit of cancer diagnosis in primary care has been commissioned. This incorporates the conduct and evaluation of Significant Event Audits (SEA) for cancer, and the results of that work are presented in this report.

Aim and methods

The main aim of this study was to gain insights into the events that surround the diagnostic process for two groups of cancers (lung cancer and cancers affecting teenagers and young adults), drawn from secondary analysis of SEA documents. General practices in two NHS areas in the north east of England were invited to participate. They were asked to identify the last patient in the practice diagnosed with lung cancer, and the last patient diagnosed with cancer as a teenager or young adult (i.e. aged 15–25), even if that patient may now be deceased. They were provided with an electronic template on which to document their SEA based on the structure recommended by the National Patient Safety Agency.

The accounts in these documents were synthesised and a qualitative approach to analysis adopted. An interpretative matrix was developed for each cancer group, based on a modified framework approach. Relevant data from each SEA were incorporated into a thematic chart as a means of facilitating the identification and interpretation of both common and diverse aspects related to presenting features and pathways of care for each cancer. In addition, comparisons were made on the reflections provided by practices in relation to the process of diagnosis, what happened in each case, and why it happened.

Findings

SEA reports were returned for a total of 132 lung cancer diagnoses and 35 diagnoses related to cancers in teenagers and young adults. Practices in general engaged well with the process and provided high quality SEA reports. Interpretation of these accounts demonstrated the complexity of the process of diagnosis in general practice. The majority of SEAs studied demonstrated appropriate recognition and referral for both cancer groups. Where the process of recognition had taken longer there were often reasonable explanations for this. For lung cancer these related to CXRs reported as normal or with findings consistent with benign disease, patient factors, such as time to re-presentation or declining earlier referral, and presentation complicated by co-morbidity or presenting complaint. For TYA cancers, longer times to referral were related to very unusual presentations in extremely rare cancers. Some opportunities for earlier diagnosis were also identified.

Learning points identified by practices centred on the themes of a) presentation and diagnosis of cancer, b) system issues and the primary/secondary care interface, c) patient related factors, d) practitioner issues, and e) the role of guidelines.

Conclusion

Secondary analysis of SEA reports is a novel approach to investigating recognition and referral of cancer and one that has considerable value in relation to understanding the circumstances surrounding diagnosis and referral for cancer symptoms in primary care. Useful insights into this process have been identified, resulting in the generation of recommendations for practice. In addition, the process of completing SEAs has facilitated practice identification of relevant learning points, with associated changes to practice. A particular benefit of the SEA process for this project has been its potential impact on improving clinical practice, not least in relation to re-review of referral guidelines and pathways.

2. KEY MESSAGES

2.1 GENERAL MESSAGES

- ❖ Secondary analysis of SEAs in this way has provided valuable insights into recognition and referral of cancer within primary care.
- ❖ Engaging in the process of SEA completion provided practices with an opportunity to re-consider cancer referral guidelines and the 2WW rule.
- ❖ The recognition and referral process documented in the majority of SEAs from both cancer groups was appropriate.
- ❖ Presentation, both for lung cancer and for TYA cancers, is complex.
- ❖ Safety-netting is important. The common lesson across these different cancer groups was the need for practices to have mechanisms in place to follow-up, manage and refer non-resolving symptoms.
- ❖ In some cases, it might be appropriate to consider arranging specific follow up by giving an appointment time rather than advice to come back if a symptom does not improve.
- ❖ It is important to have systems in place within practice to deal with abnormal results.
- ❖ It is important to consider the recent history of presentations, even if the patient presents symptoms as pertaining to separate episodes.
- ❖ It is important to have continuity of care within practice where possible; and if not, to ensure that consultations are linked by the reviewing practitioner.
- ❖ It is important for GPs to maintain an overall view of presentations and symptoms, even if specialist teams are involved.
- ❖ It is important to understand the process of reflection. While the majority of practitioners returned high quality reports demonstrating a great deal of reflection on the case (how it reflected care for cancer patients in their practice), and went on to consider and implement changes to practice where it was warranted, there did appear to be some need to understand the process of reflection more fully.

2.2 MESSAGES RELEVANT TO LUNG CANCER

- ❖ Differentiating new, potentially malignant symptoms in patients with known chest disease can be difficult.
- ❖ Lung cancer should be considered in the differential diagnosis of shoulder and neck pain, particularly in at-risk groups.
- ❖ There is scope for education of patients at particular risk of lung cancer, in order to encourage earlier presentation with ongoing and new chest symptoms.
- ❖ Co-existing disease may mask the symptoms of malignancy. There is a need for clearer guidance regarding the role of CXR in COPD assessment, and the role of CXR in long term condition reviews for known smokers.
- ❖ It is important to have appropriate safety-netting and to implement follow-up plans with patients, even if they are presenting with their first recent infective episode.

- ❖ Greater understanding of those patients with the most common presenting symptomatology (cough; productive cough; other symptoms suggestive of infection) may be where most could be learned to ensure appropriate recognition and referral for potential lung cancer patients.
- ❖ Negative CXRs or CXRs reported with a benign explanation for the appearance do not exclude the diagnosis of cancer. Such patients should be referred in the context of non-resolving symptoms.
- ❖ The appropriateness of recommendations related to the time at which CXR is carried out in smokers who have chest infection symptoms needs to be considered. This is currently based on pragmatic recommendations, and these require investigation, probably in the context of a trial of different models of intervention.

2.3 MESSAGES RELEVANT TO TYA CANCERS

- ❖ Cancer in teenagers and young adults presents in many different ways. As is well known, these are all very rare in the experience of an individual GP and diagnosing cancer in low risk age groups is difficult.
- ❖ There is particular complexity around presentation of bone tumours and sarcomas, and practitioners need to be aware of the non-resolving alleged sports injury.
- ❖ It is important to have an appropriate consulting style that would allow young people to feel comfortable enough to explain their symptoms.
- ❖ It may be appropriate to consider primary care follow-up of musculoskeletal pain thought to be injury related.
- ❖ The reason for ongoing musculoskeletal pain should be identified, particularly if it is of a long duration.
- ❖ All neck and axilla lumps should be referred under the 2WW rule unless there is an obvious infective cause, in which case the patient should be reviewed.
- ❖ Careful consideration should be given to unusual presentations by teenagers and young adults, and referrals made if the diagnosis is not clear.

3. BACKGROUND

Cancer is a major global health problem, and one that accounts for more than one in four of all deaths in the UK [General Register Office for Scotland, 2008; Northern Ireland Statistics and Research Agency, 2008; Office of National Statistics, 2008]. Survival rates are below those of most comparable countries, and it is argued that this is largely due to later diagnosis. The principal method of identification of cancer in the UK is symptomatic presentation, usually to general practitioners (GPs), who as a result of their gate-keeping role within the NHS are the usual source of referral to secondary care. There is now considerable interest in improving the quality of care, and patient experience, between first attendance to primary care with a cancer symptom and reaching a diagnosis. As part of the National Awareness and Early Diagnosis Initiative (NAEDI) to promote timely diagnosis of cancer, a national audit of cancer diagnosis in primary care has been commissioned. This incorporates the conduct and evaluation of Significant Event Audits (SEA) for cancer, and the results of that work are presented in this report.

"Any event thought by anyone in the team to be significant in the care of patients or the conduct of the practice" *Pringle et al, 1995*

Significant Event Audit is a quality improvement technique that is in routine use in general practice. It was developed in the mid-1990s as a method of quality assurance, with the aim enabling primary care teams to identify and learn from strengths and weaknesses in the provision of care [Pringle *et al*, 1995]. SEA can be applied to any aspect of healthcare, and provides a structured narrative analysis of the circumstances surrounding the event of interest. This can be something that almost went wrong, or that did go wrong, or equally it can be something that went well. In 2004, SEA was incorporated as an education indicator into the *Organisational domain* of Quality and Outcomes Framework (QOF), as part of the New General Medical Services contract. Through this, payments are made to practices that have undertaken "a minimum of twelve significant event reviews in the past 3 years, which could include..... new cancer diagnoses" [BMA, 2004]. In addition, SEA is a process that is encouraged by the National Patient Safety Agency (NPSA), which states that significant event audit "should be undertaken by all primary care practices..." [National Patient Safety Agency, 2006].

Relatively little research has been carried out into the use of Significant Event Audit in primary care practice. Previous work has involved the development of reliable tools for peer assessment of SEAs carried out by GPs [McKay *et al*, 2007]. Other researchers have reviewed SEAs carried out in their own district [Cox and Holden, 2007]. However, a recent review of the evidence-base in this area demonstrated that to date, "a chasm exists between the high expectations for SEA and the lack of evidence of its impact" [Bowie *et al*, 2008]. This was attributed, amongst other things, to the lack of a robust, standard structured method to the process, and to selective topic choice by practitioners.

Analysis of an event can be guided by four questions: what happened, why did it happen, what has been learned, what has been changed?

The project reported here sought to use established research methods to evaluate the use of SEAs on an area of service development. Cognisance was taken of the concerns documented by Bowie *et al*, regarding structure and subject matter, and the project used a single, well established SEA template for a clinical topic area not selected by the GPs conducting the audits. Whilst collection of SEAs in some format or another can now be considered part of routine clinical general practice, use of the resultant data for research purposes, such as that reported here, is novel. It was agreed with the National Cancer Director that this work would relate to lung cancer and cancers affecting teenagers and young adults (TYA).

4. AIMS AND OBJECTIVES

The overall aim of this study was to gain insights into the events that surround the diagnostic process for two cancer groups (lung cancer and cancers affecting teenagers and young adults), drawn from secondary analysis of Significant Event Audit documents. The specific objectives were to:

1. Consider the presenting factors for patients with lung cancer, and determine those that may be amenable to intervention in order to impact on the process to presentation,
2. Consider the practice or service related issues for patients with lung cancer, and determine those that may be amenable to intervention in order to impact on the diagnostic and referral process,
3. Consider the presenting factors for teenagers and young adults with cancer, and determine those that may be amenable to intervention in order to impact on the process to presentation,
4. Consider the practice or service related issues for teenagers and young adults with cancer, and determine those that may be amenable to intervention in order to impact on the diagnostic and referral process,
5. Identify the key learning points that practices have drawn from considering these diagnoses, along with any changes that they have introduced to their practice,
6. Determine whether the narratives and reflections presented differ depending on whether they relate to a common or a rare cancer,
7. Identify case studies of good practice.

5. METHODOLOGY

5.1 ETHICAL CONSIDERATIONS

The National Research Ethics Service (NRES) was contacted prior to the study being undertaken, and advised the research team that this work was considered to be serviced evaluation and as such did not require NHS ethical review. The project was approved by the Faculty of Medicine Research Ethics Committee at the University of Glasgow. Data analysis is based on SEAs completed as part of the NAEDI initiative. The GPs involved were informed that any SEAs provided would be subject to secondary analysis for research purposes, and were aware that there was no possibility that the practice would be identifiable to the research team. In order to maintain that anonymity, written consent was not provided but was implicit in the return of the SEA reports.

5.2 STUDY SETTING

This research was carried out in two NHS areas in the north east of England, NHS South of Tyne and Wear, and NHS County Durham, which are incorporated within the North of England Cancer Network (a network covering a population of over three million service users). A total of 202 general practices from urban, rural and semi-rural areas, providing primary health care services to populations from differing socio-economic areas, were invited to participate.

5.3 DATA COLLECTION

As part of the NAEDI initiative, general practices in the relevant PCTs were contacted by the local NHS Cancer Leads and asked to undertake two significant event audits related to cancer diagnoses. They were asked to identify the last patient in the practice diagnosed with lung cancer, and the last patient diagnosed with cancer as a teenager or young adult (i.e. aged 15–25). They were specifically asked to include patients who may since have died, as it was expected that this might be the case in some instances. It was anticipated that for many practices the last young person might have been diagnosed several years ago, however we thought it likely that many practices would still have records of these diagnoses, and given the infrequency of such cancers in practice, that they would remember such a diagnosis sufficiently to complete an SEA report. Where there was no such diagnosis within the history of the current partners, practices were asked to send SEA reports relating to the last two lung cancer diagnoses.

Practices were provided with an electronic template on which to document their SEA (Appendix A). This was based on the structure recommended by the National Patient Safety Agency, and comprised five sections to enable practitioners to 1) document the process of the event, 2) reflect on and understand what and why it happened, 3) identify the learning points, both good and bad, 4) consider changes to be made or actions to be taken (or that have already been made or taken), and 5) consider what was effective about the SEA. In addition, as part of these sections, we included some specific pointers for GPs to consider when completing the proforma, in order to try to build a richer and more comprehensive understanding of the circumstances surrounding diagnosis of these cancers. SEA reports were returned to the relevant NHS Cancer Lead, who ensured that no identifiable data had

been included, and that the reports were anonymised. Following this process, the reports were forwarded to the research team.

5.4 DATA ANALYSIS

Since the SEA reports represent a narrative account of a specific event, in this case a new diagnosis of cancer, and the context surrounding it, a qualitative approach to analysis was employed. The SEA documents were read through and EM recoded the raw data thematically, following discussion with UM about emerging themes. At the outset, a sample of reports were reviewed and coded independently by both EM and UM as a means of validating the analytic process. In order to better understand the factors surrounding the pathway of diagnosis and referral, an interpretative matrix was developed for lung cancer (Appendix B) and for teenage and young adult cancers (Appendix C). The matrix was based on a modified framework approach, and relevant data from each SEA were incorporated into a thematic chart as a means of facilitating the identification and interpretation of both common and diverse aspects related to each cancer. QSR Nvivo 2.0 software was used to facilitate the analysis of themes and systematic comparisons across reports.

In addition to coding, comparisons were made on the reflections provided by practices in relation to the process of diagnosis, what happened in each case and why it happened. These reflections were reviewed to try and identify positive and negative narrations of events, thereby determining whether there is a difference in SEA reporting depending on whether the audit relates to diagnosis of a common or rare cancer.

6. RESEARCH FINDINGS

6.1 PARTICIPATING PRACTICES AND SIGNIFICANT EVENTS

Significant Event Audits were received from a total of 92 practices, 46% of those invited to participate. Thirty eight percent ($n=35$) returned audits related to both lung and teenage and young adult cancers, while a further 44% ($n=40$) returned two lung reports. The remainder returned one lung audit. Thirteen practices had returned reports related to teenage and young adult cancers, but the patients concerned were outwith the relevant age range, and as such, the reports were excluded from this analysis (one practice subsequently returned an additional lung report).

Participating practices encompassed a range of geographical and organisational settings. Most were based in urban or semi-urban locations, with more than two-thirds having a patient list of more than 5,000 (Table 1). Over half did not have training practice status, although many did teach medical students (55% of all practices; 75% of training practices; 42% of non-training practices).

Table 1: Characteristics of participating practices

PRACTICE CHARACTERISTIC	LUNG SEA (%)	TYA SEA (%)
TOTAL NUMBER OF PRACTICES	92 (100.0)	35 (38.0)
List size		
<2,500 patients	11 (11.9)	2 (5.7)
2,501-5,000 patients	16 (17.4)	3 (8.6)
>5,000 patients	62 (67.4)	29 (82.8)
Unknown	3 (3.3)	1 (2.9)
Geographical location		
Urban	50 (54.3)	18 (51.4)
Semi-urban	30 (32.6)	14 (40.0)
Rural	9 (9.8)	2 (5.7)
Unknown	3 (3.3)	1 (2.9)
Training status		
Training practice	40 (43.5)	18 (51.4)
Non-training practice	50 (54.3)	16 (45.7)
Unknown	2 (2.2)	1 (2.9)
Teaching status		
Teaches medical students	51 (55.4)	25 (71.4)
Does not teach medical students	39 (42.4)	9 (25.7)
Unknown	2 (2.2)	1 (2.9)

SEA reports were returned for a total of 132 lung cancer diagnoses and 35 diagnoses related to cancer in teenagers and young adults (Table 2). Most of the lung diagnoses were made in 2008-2009 (85%), with the remainder ($n=20$) diagnosed between 2003 and 2007. Average age at diagnosis was 68 (SD 11.1). Date of diagnosis for TYA cancers ranged from

1986 to 2009; two in the 1980s, three in the 1990s, and the remainder since 2000, with the majority (71%) diagnosed from 2005 onwards. Average age at diagnosis was 20 (SD 2.8). Around half of all patients in each group were recorded as being male, and the majority were alive at the time of SEA completion (64% lung; 86% TYA).

Table 2: Characteristics of included patients by cancer type

PATIENT CHARACTERISTIC	LUNG (%)	TYA (%)
TOTAL NUMBER OF PATIENTS	132	35
Gender		
Male	64 (48.5)	18 (51.4)
Female	43 (32.6)	6 (17.1)
Unknown	25 (18.9)	11 (31.4)
Age at diagnosis		
Range	30 – 93	15 – 25
Mean / SD	67.9 / 11.1	20.3 / 2.8
Vital status		
Alive	85 (64.4)	30 (85.7)
Dead	47 (35.6)	5 (14.3)

6.2 INSIGHTS INTO THE REFERRAL PROCESS FOR LUNG CANCER

Information reported within the SEAs in relation to the process of referral for lung cancer was extracted and incorporated into an interpretative thematic matrix (Appendix B). In this section we present a synthesis of these data. Whilst we did not obtain any identifiable practice or patient data for the lung reports, we did not want to include any details in the matrix that might make the cases appear less anonymous. We have included age at diagnosis and information on lifestyle factors such as smoking status, as these are of relevance. However, we have not included year of diagnosis or patient gender. The data relate to the process of care from first presentation with a symptom, and in some instances also include contextual information about presentations in the preceding year. Due to the nature of the SEA process, which primarily relates to reflection on care provision, the GPs have focused mainly on what happened following presentation, although some have made additional comment on how long patients tolerated symptoms before presenting.

The data presented demonstrate the complexity of the process of diagnosis of lung cancer. Chest symptoms are common in general practice, and extremely common among smokers, who have a much higher risk of lung cancer than other population groups. It is within this context that GPs have to decide who to treat, who to investigate, and who to refer.

6.2.1 Initial symptom(s) on presentation

The SEA reports have provided a substantial amount of information regarding patient symptoms on initial presentation (Appendix B).

For the purpose of trying to understand these in greater detail, presenting patterns can be sub-divided into three main categories:

[1] Chest symptoms and symptoms suggestive of malignancy. Reported symptoms that fall into this category included:

- *cough, with or without phlegm, and other chesty symptoms often initially suggestive of infection*
- *shortness of breath*
- *haemoptysis*
- *chest pain*
- *shoulder pain*
- *weight loss*
- *hoarseness*
- *chest wall swelling*
- *lymphadenopathy*

Of the 132 lung cancer SEAs analysed, almost three quarters of all patients discussed ($n=97$; 74%) presented with a symptom or symptoms in this category.

[2] Other symptoms that would generally not be thought to be suggestive of lung cancer. For some patients whose symptoms fell into this category, lung cancer may have been an incidental finding in the investigation of other symptoms. For others, the presentation was unusual, while for others still, the presentation reflected metastatic disease. Reported symptoms in this category included:

- *abdominal and epigastric pain*
- *painful leg*
- *lack of co-ordination of legs*
- *atrial fibrillation (AF)*
- *relatives noticed lips blue*
- *weakness left hand and arm*
- *arm pain*
- *neck pain*
- *feeling of lump in throat*
- *routine bloods found to be abnormal*
- *vague symptoms*

Of the 132 lung cancer SEAs analysed, a small number ($n=20$; 15%) of the patients discussed presented with a symptom or symptoms in this category.

[3] Events where the diagnosis did not arise from the patient presenting with a symptom to a GP. Of the 132 lung cancer SEAs analysed, a minority of patients ($n=15$; 11%) presented in this way. Patients were diagnosed in a number of ways, including:

- *on blood checks for rheumatic disease, GP noticed rising inflammatory markers rising and falling Hb*
- *emergency admission for UTI; emergency admission with a fractured hip*

- *A&E attendance with chest pain (four different patients); A&E attendance with haemoptysis*
- *seen by Urgent Care Team with cough and admitted to hospital*
- *under follow up for bladder tumour, referred to respiratory with pulmonary nodule*
- *lung primary found during CT scan as follow up for anal cancer*
- *diagnosis made abroad*
- *incidental finding as part of dementia work-up*

It was unclear from many of these accounts who had organised these emergency admissions. Consequently, we have not assumed that the GP did so, as there are other accounts of emergency admissions within the categories listed above in which it is very clear that it was arranged by the GP. It is also possible that some of the admissions described here were arranged out of hours.

These descriptions demonstrate that while for many patients initial presentation was about lung and lung related symptoms, the nature of the presentations varied hugely, and occurred in the context of other illnesses, as well as a known tendency for smokers and for those with chronic obstructive pulmonary disease (COPD) to present with chest infection type symptoms. The “text book” presentation of haemoptysis, while reported, was only the case for a minority of the patient included in this study. Much more common was a combination of symptoms initially pointing to chest infection; almost half of the cases presented in the SEA reports presented in this way.

6.2.2 GP response to presentation

Responses made by GPs, both to the initial presentation and then to subsequent consultations, were in keeping with commonly accepted practice. Thus, at first presentation those presenting with new chest related symptoms were frequently examined, examination findings noted, antibiotics prescribed, and chest x-ray (CXR) ordered. Other documented responses include venepuncture, referral to specialist clinic or to another primary care professional (such as a physiotherapist), emergency admission, arrangement of follow-up review, or patients advised to return if there was no improvement. Other patients were given analgesia for pain, and some were given smoking cessation advice. Many patients were seen more than once in general practice. Subsequent response by the GP was determined by the nature of the symptoms; many patients were re-examined, some had further courses of antibiotics. Many had a CXR ordered for non-resolving symptoms, and those who became more unwell were admitted as emergencies.

6.2.3 The occurrence of co-morbidity

As might be expected, the vast majority of patients considered in these SEAs were smokers or ex-smokers, and many had already been diagnosed with COPD, or with one of the other diseases for which smoking is a risk factor, including coronary artery disease, cerebrovascular disease and peripheral vascular disease. Other fairly commonly reported co-morbidities were anxiety, depression, hypertension, other chest conditions including asthma, and diabetes. A small number of patients were reported as having atrial fibrillation (AF), another cancer, arthritis, dementia, hypothyroidism or renal problems. In addition, a number of the reports documented previous asbestos exposure or that the patient was an

ex-miner, perhaps reflecting the geographical setting of the audit. As discussed in subsequent sections, the existence of these additional morbidities and lifestyle factors is likely to have contributed to interpretation of symptoms and GP response to presentation.

6.2.4 Time to referral

Time interval from initial patient presentation with a relevant symptom to referral or acute admission was identifiable in the majority of SEA reports related to lung cancer ($n=115$; 87%) and data are presented in Figures 1–3. Figure 1 presents time in days for all patients for whom data were available. Figure 2 presents data for those patients whose initial symptom was chest related or potentially related to a lung malignancy, and a distinction is drawn between those who had a CXR in primary care and those who did not. Figure 3 shows data for the remainder who presented with other symptoms. The overall time interval ranged from one to 438 days (mean 59 days; median 21 days), and varied in relation to whether the symptom was respiratory in nature or was indicative of some other cause (Table 3). Regardless of symptom type, almost 60% of all patients were referred within one month of initial presentation.

Table 3: Time to referral for lung cancer

DAYS	SYMPTOM TYPE		
	All (n=115)*	Respiratory (n=96)	Other (n=19)
Range	1 – 438	1 – 438	1 – 122
Mean	59	65	29
Median	21	25	7
≤ 31	68 (59%)	53 (55%)	14 (74%)

* Number relevant / for whom data were available

Patients had a variable number of consultations with a GP prior to referral. These ranged from one consultation (at which the referral was made, or a CXR carried out which subsequently resulted in referral), to 12 consultations in one particular case. Of those patients who first presented to general practice, and for whom we were able to identify the number of consultations ($n=106$), the majority (72%) were seen between one and three times prior to referral (Table 4). However, considering number of consultations is not in and of itself particularly informative or useful in relation to understanding the referral process, as some patients were seen more than once within the period of a week, while for others there were several weeks between their first consultation and being seen again. It is therefore more helpful to consider the overall time taken from presentation to referral, and those factors that related to longer referral times.

Table 4: Number of consultations prior to referral for lung cancer

CONSULTATIONS	PATIENTS (%)
1	32 (30.2)
2	28 (26.4)
3	16 (15.1)
4	12 (11.3)
5	9 (8.5)
6	4 (3.8)
7	1 (0.9)
8	1 (0.9)
11	2 (1.9)
12	1 (0.9)

Figure 1: Time to referral/acute admission for all lung cancers

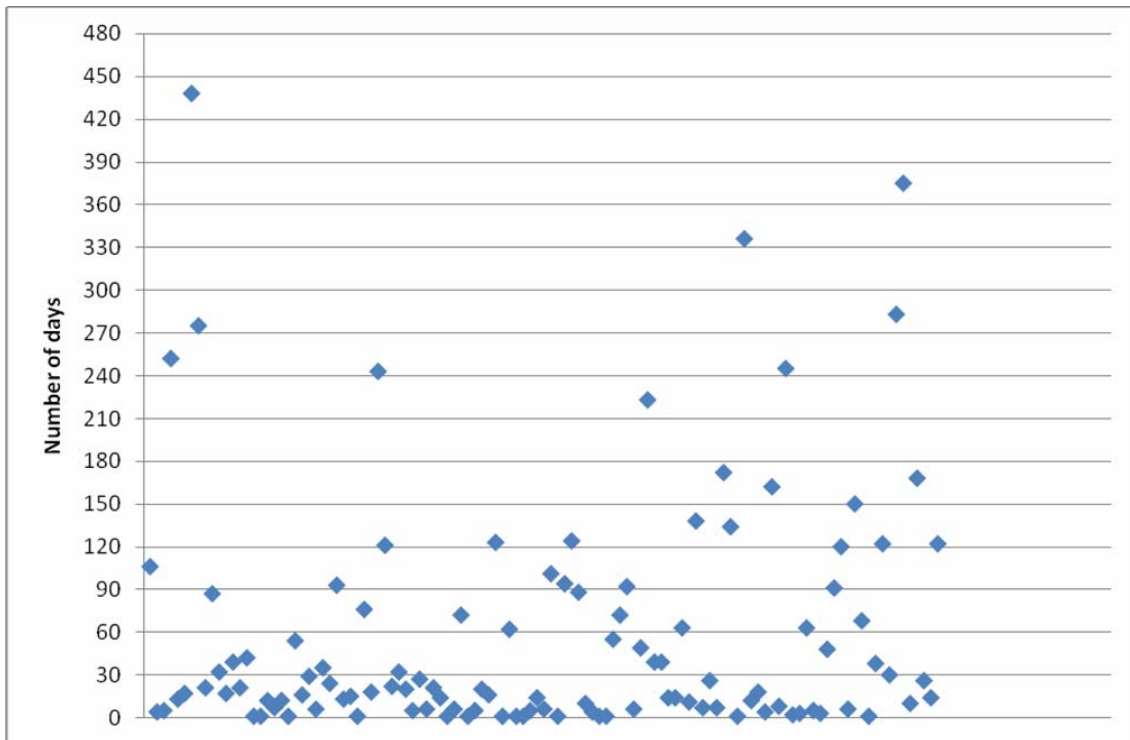


Figure 2: Time to referral/acute admission for presentation with respiratory symptoms

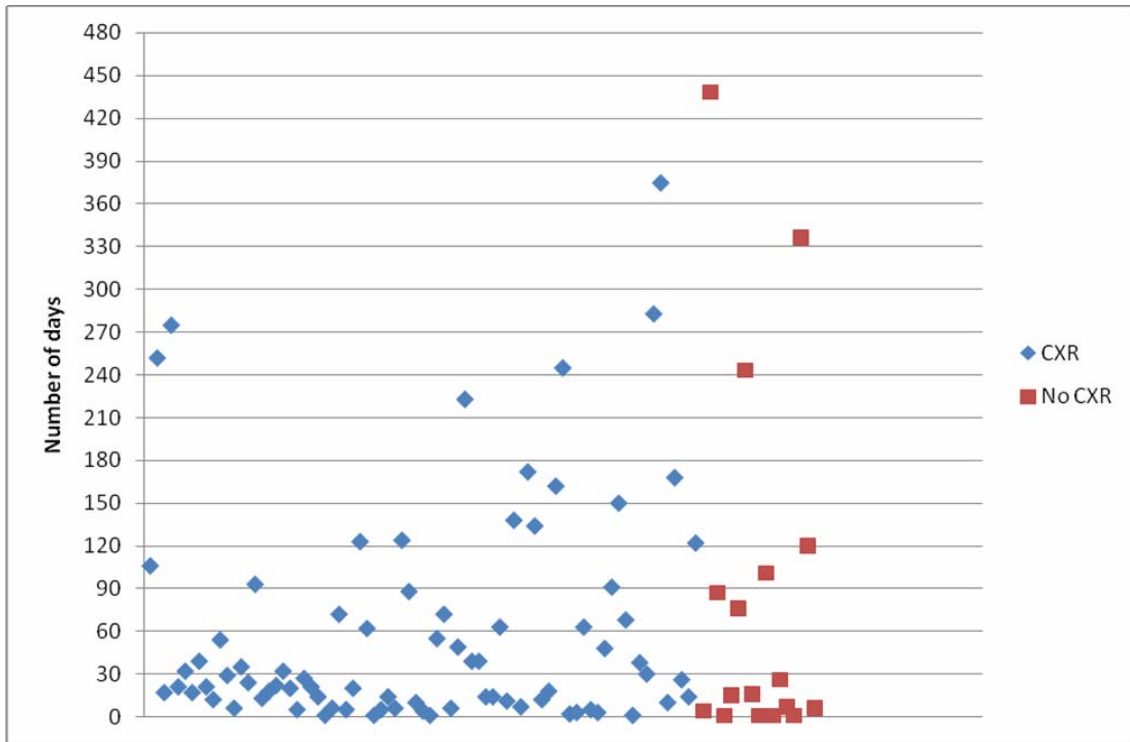
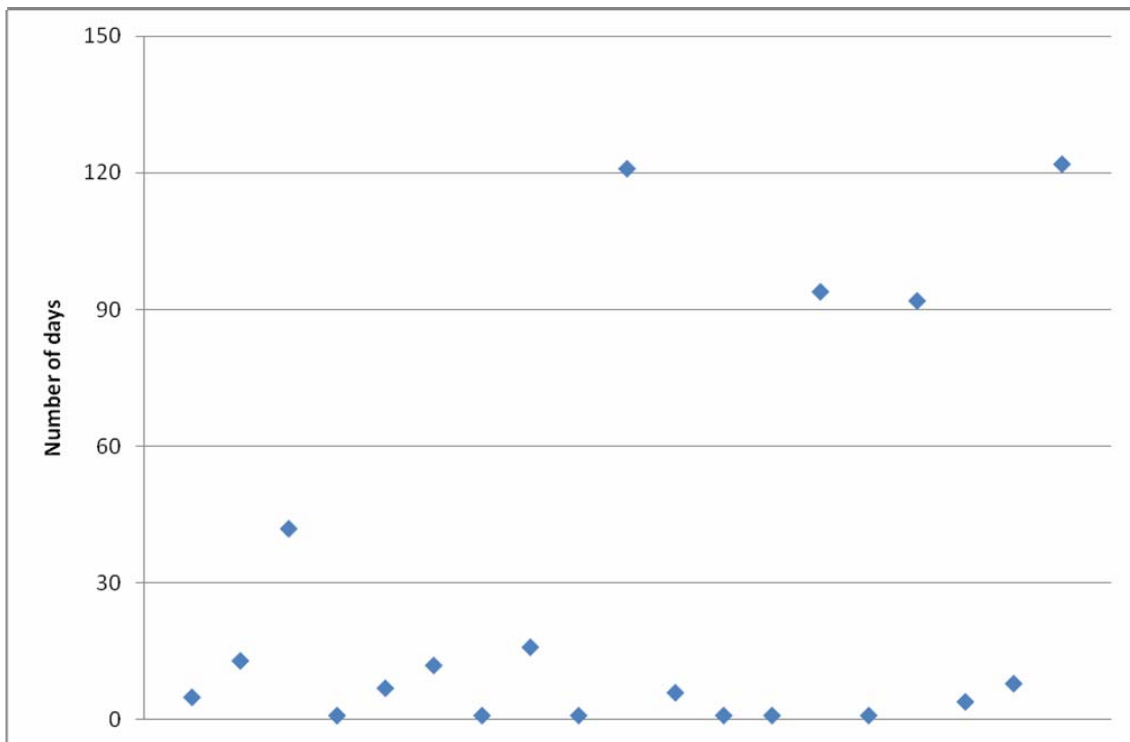


Figure 3: Time to referral/acute admission for presentation with non-respiratory symptoms



6.2.5 Understanding referrals occurring more than one month after presentation

In this section of the analysis, we carried out detailed examination of those descriptions of the referral process where that process took longer than one month, that is, more than 31 days. This is an arbitrary time point, and has not been selected because we consider either that time to referral of longer than a month is necessarily unacceptable, or even that time to referral of up to one month is acceptable in all cases. Indeed, as has already been demonstrated (see Figures 1–3), in many instances patients were referred much earlier than this. Rather, one month has been selected as this would seem to be a reasonable time for the fairly typical presentation (from our data) of **Step 1**: chest related symptom(s) to **Step 2**: initial treatment with antibiotics ± steroids to **Step 3**: early review if no improvement to **Step 4**: CXR arranged on review to **Step 5**: CXR report to **Step 6**: referral. In some instances, implementing a cut-off at the level of one month for this more detailed analysis may appear to be severe, but we wanted to ensure that we did not miss the learning opportunities that might arise from considering patients referred just after a month.

We have categorised these referrals into those for which presentation was with a chest symptom or one potentially related to a lung malignancy, and those for which presentation was with a non-chest symptom. A detailed interpretation of these presentations can be found in Appendices D and E.

6.2.5.1 Chest or malignancy related symptom presentation

Forty five out of the 132 lung cancer patients presented in the SEAs were referred more than one month after initial presentation with a chest or malignancy related symptoms. In the main, explanatory factors for these longer times to referral fell into one of three broad classifications related to a) initial CXR reports, b) patient mediated factors, and c) complexity of presentation. For some diagnostic events, the explanation involved factors related to more than one of these categories. For others, whilst a longer time to referral was involved, the initial response made by the GP was reasonable given the circumstances surrounding the presentation (see d) below).

a) Initial CXR reported as normal or with findings consistent with benign disease

Sixteen of the forty five referrals fit in to this category (Appendix D). In eleven cases, the CXR was repeated throughout the primary care diagnostic process, in five cases at the suggestion of the radiologist. This is an important finding from these data and it provides an opportunity to consider how patients with a normal or benign looking CXR should be managed. In eight cases, the CXR was reported as normal or showing no change from previous films. In other cases, the CXR showed infection, inflammatory changes or was inconclusive. In one rather unusual case, referral to the breast clinic was advised as the mass seen was thought by the radiologist to represent a breast tumour. This was subsequently diagnosed as a lung cancer.

b) Patient factors

In a number of cases (L-01, L-33, L-68, L-74, L-83, L-107, L-125) patient factors had a bearing on time to referral after first presentation. These factors included:

- waiting some considerable time after the first consultation before re-presenting with on-going symptoms (e.g. 11 weeks, 12 weeks, 8 weeks)
- declining referral when it was first offered or recommended by the GP

- failing to attend appointment for CXR or chest clinic
- declining to see the GP when recommended by the nurse
- declining hospital admission

It is likely that the reasons behind these patient decisions are complex. However, as a result of the nature of information provided within the SEA reports, it is not possible to understand these decisions further within this analysis.

c) Complexity of presentation

Analysis of a number of SEA reports demonstrated the intricacy of the cases discussed, and led to the conclusion that the set of presenting symptoms, although chest or malignancy related, were so complex that it would have been challenging to reach an earlier diagnosis. In these situations, the complexity related either to co-morbidity (L-10, L-35, L-76, L-79, L-124), to a seemingly alternative initial diagnosis (L-64, L-67, L-122), or to symptoms pointing towards a different malignancy (L-99).

BOX 1: Complexity involving co-existing disease

Case report A: Patient (aged 78) presented with cough and was given antibiotics. Attended secondary care three times each week for renal dialysis; four unsuccessful attempts were made by the practice to contact the patient by phone, assumed to be because of the dialysis sessions. The patient was eventually admitted to hospital. GP and Community Matron were both involved; in addition, the patient was seen at A&E and discharged. On first emergency admission with breathlessness, CXR showed fluid overload due to a valvular heart condition. GP is still unclear as to how diagnosis was eventually reached.

Case report B: Healthcare assistant noted that the patient (aged 74) was coughing a lot. Had been on an ACEi and initially the cough was thought to be caused by this. The ACEi was changed to an ARB to which the patient had a reaction. Also had numerous consultations with other symptoms (including numbness in arm, dizziness, shingles type pain, leg cramps). In addition, a previous CT scan from general medicine showed *incidental findings* (40 weeks before abnormal CXR). Diagnosis was eventually made on CXR carried out at a general medicine out-patient appointment; this showed *dense L helium, could be vascular or tumour, advised referral to chest physician* (35 weeks after initial consult).

BOX 2: Complexity involving a seemingly alternative initial diagnosis

Case report C: Patient (aged 69) presented with a swollen, red and sore arm and shoulder pain, but had been given the pneumococcal vaccine the day before, and so this was diagnosed as an adverse reaction. The patient next presented 13 weeks after the initial consult complaining of back pain for which they had consulted seven times in the previous year. An MRI scan was carried out as there was concern about nerve root signs; this showed an aortic aneurysm and so the patient was referred to the vascular surgeons. Patient next attended almost another month later with continuing shoulder pain and pain over the scapula on coughing. As the patient was a heavy smoker, they were sent for a CXR which showed a mass, and so they were urgently referred. The back pain was not related to the cancer diagnosis.

Case report D: Patient (aged 63) presented with shoulder pain after press-ups, and it was thought that the pain was due to soft tissue injury. On the fourth consultation with non-resolving shoulder pain, an urgent CXR was arranged. The patient thought that the pain was due to injury – but at the third consultation they had also complained of tiredness and weight loss. CXR was arranged one week later.

BOX 3: Complexity involving symptoms suggesting a different malignancy

Case report E: Patient (aged 75) presented with persistent laryngeal discomfort, variable hoarseness, and was consequently referred to ENT. At the ENT clinic, laryngoscopy was carried out and was normal (approx. 8-12 weeks after initial consult); however symptoms persisted and the patient was re-referred to the ENT clinic approximately one year after initial consult; again, no abnormality was found. The patient was then referred to the chest clinic, and was seen around three months later, where lung cancer was diagnosed.

d) Described event involved a reasonable response to initial presentation

Some SEA reports described scenarios which, although not unduly complex, and thus could did not fit into the previous category (although clearly this is a subjective judgement), nonetheless indicate that an appropriate or reasonable course of action had been undertaken by the GP at initial presentation. Some of the events falling into in this category involved patients who were referred just a few days longer than a month. They included:

- L-11: Patient presented with right axillary chest pain, which was thought by the GP to be musculoskeletal. Patient was next seen three weeks after initial consultation, and although this was mainly to do with cardiovascular risk assessment, a CXR was arranged, which suggested malignancy. The report of this came through seven days later; the patient could not be contacted for three days due to work commitments, and consequently was referred 10 days after CXR, making time from first presentation to referral five weeks.
- L-13: 90 year old patient presented with a four day history of a tender swelling on the anterior chest wall. The possibility of a metastatic nodule was considered, but tenderness suggested infection and the patient was therefore prescribed antibiotics. Active management of a cancer was always considered inappropriate (presumably in view of the patient's age). At the second consultation (one month after initial consult), referral was discussed but deferred at the patient's request, although they were referred one week later.

- L-26: 70 year old patient presented with a persistent (no detail accompanies use of the word 'persistent') productive cough with yellow sputum, having not had any other consultations in the previous year. The patient was a never smoker, but had been a passive smoker. Antibiotics were prescribed and the patient returned just over one month after the initial appointment. The cough was still present so a CXR was then requested.
- L-85: Patient mentioned cough in passing during a coronary heart disease review with the GP and a check up for raised MCV. The GP arranged repeat bloods; and advised the patient to return if the cough had not settled in one month. The patient returned four weeks after initially seen. CXR was requested that day and subsequently a 2WW chest clinic referral was made. It seemed reasonable to ask the patient to return in one month if the cough had not settled (although we acknowledge that the guidelines suggest three weeks). However, we can also consider that if the GP had not followed up the raised MCV by inviting the patient for review (compared, for example, to writing with a request to attend for more blood tests, which would have been an alternative reasonable course of action), the patient may not have complained of the cough for some time.
- L-114: Patient presented with infective symptoms and was referred for an urgent CXR one month after initial presentation when they developed haemoptysis.
- L-115: 93 year old never smoker presented with a several week history of dry cough, was given antibiotics, and at review said the cough had cleared up. CXR was arranged at the next consultation, almost three months later, when the patient complained that the cough had persisted.

6.2.5.2 Opportunities for earlier diagnosis of lung cancer involving chest symptoms

Detailed analysis of the 45 reports in which referral took longer than a month highlighted a number of cases in which opportunities for earlier diagnosis may have been missed (Appendix D). As far as we can determine, there were nine such cases within these data. This amounts to one fifth of those who were not referred within a month, and a small proportion of the total number of patients who presented with chest or malignancy suggestive symptoms within primary care (9%). These are important cases as they afford opportunities for learning and consideration of changes that might be put in place to prevent longer referral times. We present these cases taking full cognizance of the challenges faced by general practitioners in differentiating between benign and potentially malignant symptoms, particularly in patients with known chest disease. Our concern is to learn from referral histories in order to improve care for patients with potential lung cancer symptoms as much as possible. Examples of such cases are as follows:

- L-07: 1 week history of cough in a 62 year old smoker treated as a viral infection. The next presentation was 22 weeks later. However, the patient had seven consultations before being referred 63 weeks after first presentation with cough. These consultations included complaints of chest pain (but tender over chest wall and acromioclavicular joint), pains in shoulder and neck, chesty cough, cough and chest pains diagnosed as chest infection, further chest infection, ankle swelling and pleuritic chest pain.

- L-49: Patient had two consultations, 22 days apart for URTI symptoms. They then re-presented six weeks after the second consultation with shortness of breath at which point a CXR was carried out. It is not possible to tell from the information provided whether the two initial two consultations were URTIs (on both occasions chest was clear, but an antibiotic was given on the second occasion), or whether a different interpretation might have led to an earlier diagnosis.
- L-88: 63 year old patient with known asbestos exposure presented with increasing shortness of breath. CXR ordered two months after initial consultation.
- L-92: 66 year old patient with known COPD was seen five times with exacerbations of COPD in the five months prior to referral. Patient was sent for a CXR when complained of weight loss. There is a possibility that some changes may have been detected in some of the earlier presentations, which appear to have been diagnosed as separate episodes.
- L-110: 59 year old patient presented with a three week history of cough and was given antibiotics. Next re-presented two months later, still coughing, so was sent for urgent CXR. The patient was a non-smoker which may have lowered the index of suspicion, but guidelines would suggest CXR should have been carried out at initial presentation.
- L-116: 64 year old patient with known COPD, well known to the respiratory team, presented with increasing shortness of breath, cough, wheeze and leg weakness. Specialist respiratory nurse also involved. Referral was made when symptoms worsened further by which time patient had superior vena cava obstruction.
- L-118: 59 year old patient presented with a two month history of persistent cough with yellow phlegm. Was prescribed antibiotics and then next re-presented in a further two months.
- L-119: 82 year old patient presented with a chesty cough with purulent sputum. Next presented four weeks later with similar symptoms, then again another 20 days later. CXR was arranged at the fourth consultation.
- L-125: Patient seen several times with new chest symptoms before CXR ordered. Patient factors also relevant in this case; patient had a fear of investigations and hospitals.

The main lessons that can be drawn from these events are:

1. It can be difficult to differentiate new, potentially malignant symptoms in patients with known chest disease.
 2. It is important to consider the recent history of presentations, even if the patient presents the symptoms as pertaining to separate episodes.
 3. It is important to have appropriate safety-netting and to put in place follow up plans with patients, even if they are presenting with their first recent infective episode.
 4. It is important for GPs to maintain an overall view of presentations and symptoms, even if specialist teams are involved.
 5. It is important to consider lung cancer as a differential diagnosis in patients presenting with shoulder and neck pain, particularly those in at-risk groups.
-

6.2.5.3 Non-chest or malignancy related symptom presentation

Of the 20 patients whose histories showed that they presented with symptoms which were not chest or malignancy related, only five waited longer than a month before being referred. Whilst these five cases are interesting, as summarised in Appendix E, all have reasonable explanations for the process to referral taking longer than a month. They included:

- Presentation with epigastric pain, where referral was made to gastroenterology after an ultrasound showed liver metastases.
- A complicated scenario involving initial presentation with neck pain and nausea. An ultrasound arranged by gastroenterology showed a pelvic mass and ovarian cancer was eventually diagnosed. A CT scan performed during work up showed lung cancer, which appears to have been incidental finding.
- Presentation with painful left arm, thought initially thought to be musculoskeletal. The patient was therefore referred to physiotherapy one day after initial consultation, who in turn, suggested referral to orthopaedics some weeks later. Diagnosis was eventually non small cell cancer invading brachial plexus.
- Presentation with left arm and neck pain and referral to physiotherapy; however, the patient had normal investigations following an episode of haemoptysis within the previous year.
- A patient with hyponatraemia found during investigations for diarrhoea, but the initial CXR was inconclusive.

6.2.6 Case studies of exemplary practice in lung cancer diagnosis

Many examples of good practice were documented in the lung SEA reports. Some specific, exemplary cases are outlined below.

EXEMPLAR A:

L-06: Patient presented with a history of URTI with increasing cough. Examination revealed tenderness over the anterior chest wall and right chest signs. The patient was prescribed analgesia and antibiotics, and given a review appointment with the same GP to check resolution after treatment. Patient was reviewed two weeks later and reported pain was much better but cough persisted. Examination showed that there were still signs in the chest. CXR was organised and carried out two days later. The following day the report was faxed to the surgery. The GP contacted the patient that day and arranged for them to come into the surgery the same day with a family member, after which a 2WW referral was sent.

This case demonstrates the importance of good safety-netting, as well as good communication between primary and secondary care, and between the GP and the patient and their family.

EXEMPLAR B:

L-09: Patient presented with a hoarse voice and was treated by the GP. Review was arranged for eight days later at which time the patient was no better. The patient was referred under the 2WW to ENT for persistent hoarse voice. CXR was done as part of the work up and showed a suspicious lesion. The patient was then referred under the 2WW to the chest clinic.

This case demonstrates the importance of good safety-netting, as well as good follow-up by the GP as part of the referral process.

EXEMPLAR C:

L-14: Patient (50 year old ex-miner) with a known diagnosis of asthma presented with a one month history of dry cough. There were chest signs on examination and the patient was given a course of steroids, but because of the duration of cough, a CXR was arranged at that initial consultation. This showed signs of infection in the right lung. Follow-up was not recommended by the radiologist. The patient attended again around three weeks later saying that they still had a dry cough and did not feel quite right. Chest signs were heard corresponding to previous CXR changes; the patient was given antibiotics but a repeat CXR was ordered to ensure resolution of infection. However, the CXR showed progressive changes and the patient was immediately referred under the 2WW to the chest clinic.

This case demonstrates the importance of vigilance, good safety-netting, and GP follow-up.

EXEMPLAR D:

L-28: Patient was under the care of the rheumatologists. GP noted that the inflammatory markers had been rising and the haemoglobin falling, and so wrote to the rheumatology consultant. The patient did not have any symptoms, but the rheumatology appointment was brought forward and a CXR carried out at the clinic; this showed a lung mass.

This case demonstrates the importance vigilance by the GP, particularly as these blood tests were secondary care results being copied to general practice. The communication between primary and secondary care worked well.

EXEMPLAR E:

L-43: Patient (72 year old) presented to the GP registrar with a three-week history of a productive cough. In view of smoking history and clinical findings, a CXR was ordered. The same day the radiologist phoned to say that there were significant changes in the left upper lobe and advised that the patient should be given antibiotics followed by an interval CXR four weeks later. A week later the patient returned no better and was offered immediate referral but declined this, instead opting for another antibiotic. The patient was seen another week later, much improved. They then had the repeat CXR as planned four weeks after the original one, which was slightly improved but urgent CT scan was advised and arranged.

This case demonstrates prompt appropriate action by the GP registrar in line with guidance; it also shows good communication between primary and secondary care.

EXEMPLAR F:

L-68: The patient was noted by the nurse to be thin at COPD review. They were seen the following month by the nurse, weight loss documented but declined to see the GP. The patient was persuaded to see the GP around 2 weeks later and a CXR carried out that day was reported as normal. However, in view of the weight loss the patient was referred urgently to the chest clinic.

This case demonstrates that although the process in primary care did take some time, due mainly to the patient's wishes, it was started by the observation of the nurse, who followed that observation up.

6.3 LEARNING POINTS RELATED TO DIAGNOSIS OF LUNG CANCER

One of the advantages of the SEA process is the incorporation of a discussion of the event within a team meeting, thereby ensuring that other team members who may not have been directly involved in the care of the patient can nonetheless benefit from a discussion about it. The ways in which general practitioners documented the circumstances surrounding the events put forward demonstrated that they have learned from reflection on and discussion about the case, even if the process from initial patient presentation to referral had been ideal. The learning points described fall into five broad themes relating to a) presentation and diagnosis of lung cancer, b) system issues and the primary/secondary care interface, c) patient related factors, d) practitioner issues, and e) the role of guidelines. Some of the issues raised related to diagnosis of cancer more widely, although most were specific to lung cancer; others were more points of reminder rather than points of learning.

Some points have been mentioned in the reflections of only one or two practitioners, but we have drawn out as many as possible in order to document the key issues raised by practices, and arising from completion of these SEAs.

6.3.1 Presentation and diagnosis of lung cancer

Learning points around presentation and diagnosis of lung cancer centred on the complexity related to atypical symptoms, the need for vigilance even when symptoms might seem straightforward, and the usefulness and limitations of CXR as a diagnostic tool. Issues arose around the importance of having a high index of suspicion when dealing with a range of patient groups, both those with and without existing disease, and smokers and non-smokers. Practitioners discussed the importance of CXR in patients with prolonged symptoms, even if examination suggested infection, as well as the appropriate time for referral for CXR in such patients. There was also discussion in relation to whether CXR should be routinely used in assessment for possible COPD, and whether patients with abnormal CXR should be referred under the 2WW as a precaution. Detailed learning points identified by practitioners were:

- ❖ Lung cancer does not always present typically and there can be no immediate warning signs or 'red flags' on presentation.
- ❖ Be aware of atypical symptoms and be prepared to investigate.
- ❖ Do not always assume the most common cause for a problem.
- ❖ Primary care input into management can only be achieved if patients present symptomatically.
- ❖ Initial presentation may be with secondary signs of malignancy, and this may obscure the issue and potentially delay diagnosis.
- ❖ Co-existing disease can mask symptoms of malignancy.
- ❖ The possibility of a serious diagnosis should be considered in patients with a known diagnosis, either those with an existing respiratory condition (asthma, COPD) or other concurrent disease.
- ❖ Have a heightened suspicion of lung cancer in patients with worsening COPD or new or persistent COPD symptoms.
- ❖ Malignancy should be considered as a possibility, even when symptoms sound innocuous.
- ❖ Musculoskeletal sounding pain (neck or shoulder) can be a presenting symptom for lung cancer, and should have a low threshold for CXR request.
- ❖ There is a need to always remain suspicious of symptoms in patients who are smokers.
- ❖ Lung cancer can occur in patients who are non-smokers.
- ❖ Have a high index of suspicion and a low threshold for investigation and CXR in patients with persistent cough (both smokers and non-smokers).
- ❖ Reminder of the general signs and symptoms of malignancy and the difficulties sometimes involved in diagnosing malignancy.
- ❖ CXR reports can sometimes give false reassurance.
- ❖ Lung cancer cannot be excluded even if a CXR is normal.

- ❖ A normal CXR can become abnormal over a relatively short time period.
- ❖ Awareness to refer people with continuing symptoms, even if CXR is negative.

“.... it was felt that there were no specific deficiencies in this case though it reminded all team members that cancer can have few general symptoms till disease is advanced, that patients may underplay symptoms and that a simple brief examination can reveal significant findings and is always worth doing even if it does not appear to be indicated”

“They all agreed that they would be aware of respiratory symptoms that don’t resolve especially in smokers/ex smokers and investigate as appropriate”

“Always be aware of patients with chronic chest disease and a high suspicion for further investigation. Don’t assume it is simply the underlying problem”

“Main learning point for the practice is that normal CXR does not exclude cancer”

“Chest x-rays are non invasive, cheap and easily arranged and we will continue to use them readily to pursue clinical suspicions”

6.3.2 System issues and the primary/secondary care interface

Much of the discussion in this area focused on communication and record keeping, either between members of the primary care team, between primary and secondary care, or between primary care and other providers such as Macmillan nurses. In the main, the SEA reports had helped highlight examples of good team working and communication, but there were some instances where there was an apparent lack of adequate communication at the primary-secondary care interface. This included non-receipt of x-ray reports or non-reporting of x-rays performed in A&E, cases where the GP had not received a discharge summary and confirmation of follow-up arrangements, where it was felt that the information provided by secondary care could have been clearer, or where a patient had not been given their bronchoscopy results and diagnosis at hospital and as a result, were unable to receive results when they next presented to primary care since the practice did not have definite confirmation or prognosis or information about treatment. Detailed learning points identified by practitioners were:

- ❖ Effective communication and team working is key.
- ❖ Be aware of those patients who are under the care of several specialties, as key questions can be missed even when there is ongoing and regular communication.

- ❖ It would be useful to document when a patient was referred urgently if a possible diagnosis of cancer was discussed.
- ❖ Difficulties related to but importance of trying to ensure continuity within the practice so that patients with ongoing symptoms can be reviewed by the same GP.
- ❖ The importance of detailed record keeping, including history taking and length of time with symptoms.
- ❖ The importance of record keeping to ensure that other colleagues are aware of patients' previous complaints.
- ❖ The importance of reviewing recent medical history (including hospital and GP appointments) when seeing a patient.
- ❖ The importance of ensuring that test results are passed to the practitioner who requested the test, for review.
- ❖ The importance of review methods for follow-up of abnormal tests (i.e. would a telephone call be more appropriate than a letter).
- ❖ Consider reviewing patients undergoing hospital investigations and follow-up as this may prevent delays in the hospital system if GP can re-refer.
- ❖ Never be wary of re-referring to secondary care, even if the patient has been discharged.
- ❖ Awareness of the 2WW and that it is very beneficial in ensuring rapid access to secondary care.
- ❖ Be prepared to question discharges from secondary care.
- ❖ The importance of immediate access to CT scan for sinister symptoms.
- ❖ The importance of direct access to CXR films electronically.
- ❖ The benefit of rapid reporting of CXR results (fax was especially useful).

“It was agreed that this was a good example of how diagnosis should work within the practice and highlighted the importance of maintaining good communication between the hospital and practice and within the practice to ensure results are passed to the appropriate person as soon as possible”

“It was acknowledged that communication between clinicians is vitally important in the current climate of general practice as patients may not always be able to consult with the same GP on every occasion. Good documentation [is] paramount to ensure other clinicians have enough information to make further clinical decisions”

“All of the clinicians use the 2 week rule templates on [the] EMIS system and are supported by the secretarial team in faxing these through to the hospital without delay. The systems work well and communication is good”

6.3.3 Patient related factors

Practitioners also identified learning points in relation to patient specific factors, primarily around co-existing disease (incorporated in 6.3.1 above) and lifestyle factors such as smoking. There was also acknowledgement of a continuing need for patient education, both around smoking cessation and cancer symptoms in general. Detailed learning points were:

- ❖ It is important to have a record of a patient's smoking status and smoking history.
- ❖ Although it is often difficult to influence patient behaviour in relation to smoking, practitioners should keep trying.
- ❖ Consider serious diagnosis in patients who present only infrequently or who are not typical candidates for lung cancer (usual good health, younger age, non-smokers).
- ❖ Be vigilant to warning symptoms even if these are brought up coincidentally when the patient attends for another reason or is discussing another issue.
- ❖ There is a need for patient education in relation to longstanding new or vague symptoms so that delay can be reduced.
- ❖ Patient autonomy during diagnostic, treatment and palliative phases needs to be respected.

“The most important lesson was felt to be the importance of smoking cessation which had never been successful in this patient”

“We, as a team, felt that what is important is the patient education regarding these unspecific symptoms such as weight loss, ‘not entirely well’, tired all the time should be the points to advertise in surgeries, local/national papers”

“... also discussed....following up of patients who FTA for investigations, the boundary between patient responsibility and that which remains with the doctor”

6.3.4 Practitioner issues

The main practitioner issue discussed, both in its own right and also cross-cutting many of the others themes mentioned in this section, was the importance of and need for “safety-netting”, that is, the inclusion of a back-up process so that when a working diagnosis and provisional management plan are made, there is also an attempt to make predictions for and to deal with alternative outcomes (Neighbour R, 1987). Roger Neighbour's original definition of the safety-netting concept included asking three questions: 1) “if I'm right, what do I expect to happen?”; 2) “how will I know if I'm wrong?”; 3) “what would I do then?”. Specific learning points made in relation to this were:

- ❖ Safety-netting is an important part of the consultation.
- ❖ There is a need to give robust safety-netting advice.

- ❖ Too much detail around safety-netting may prevent patients from re-presenting.
- ❖ It is important to 'link' consultations, especially when continuity is an issue.
- ❖ Recurrent or non-resolving complaints should be investigated further.
- ❖ Follow-up is important with upper respiratory tract infections.
- ❖ Do not assume that results will automatically be reported or that they will automatically be reported to the requesting practitioner.
- ❖ It is important to follow up patients after negative test results.
- ❖ It is important to prioritise clinical signs/symptoms rather than negative test results.
- ❖ It is important to be aware of warning symptoms when mentioned, even if that is not the focus of the consultation.
- ❖ It is important to ask specific questions when patients report improvement on review.
- ❖ Examination is a key part of early diagnosis.
- ❖ Serially documenting patient weight is valuable.
- ❖ Writing to patients who fail to attend appointments is effective.
- ❖ It is important to have up-to-date contact details for patients in case urgent contact is required.

“We are all agreed that safety netting is an important part of the consultation. The natural history of the symptoms and information provided need to be clearly recorded. Routinely asking all patients to return for a check up following an infection however is not felt to be beneficial”

“The doctor’s standard practice is to emphasise the importance of review and to explain what would happen i.e. referral to ENT. We discussed whether this may put patients off returning”

“Clinical awareness and examination are essential to get an early diagnosis”

6.3.5 The role of guidelines

Completion of these SEA reports also afforded practices the opportunity to review the role, content, and use within the practice of existing local and national guidelines, as well as the referral pathways involved in the documented cases. In many instances the learning point related to the fact that guidelines had been followed, in others that guidelines had not been appropriate given the associated circumstances, including symptoms at initial presentation not meeting the criteria for referral, patient presenting elsewhere (such as A&E) or the patient already being under specialist care. Additional learning points identified were:

- ❖ Raised awareness of the criteria for urgent or 2WW referrals for suspected cancer.
- ❖ Reminder that the NICE guidelines for COPD suggest CXR as part of initial assessment.
- ❖ NICE guidelines do not always reflect local suspected cancer referral protocols.
- ❖ It is not necessary to have a CXR result to refer under the 2WW.
- ❖ Guidelines are useful, but there is still a need for practitioners to be vigilant and to be suspicious of potentially serious symptoms.
- ❖ 'Gut instinct' and experience are also important.
- ❖ There is a need to remain patient centred, and at times to negotiate a referral pathway that is acceptable to the patient.

"2 week rule lung cancer referral guidelines were discussed and indications/criteria for referral were reinforced"

"Whilst the 2 week wait guidelines might have indicated a need for more rapid referral in this case the patient and family were quite clear that active intervention was not wanted and the doctor involved considered this to be an appropriate decision. As a result the referral pathway was negotiated with the patient who retained control of that process and ongoing treatment. Whilst there is pressure to comply with guidelines it is important to remain patient centred"

"We discussed the problems of using TWR referrals for unclear CXR pathology as too many inappropriate urgent referrals just clogs the system....."

6.4 INSIGHTS INTO THE REFERRAL PROCESS FOR TYA CANCERS

Information reported within the SEAs in relation to the process of referral for TYA cancer was extracted and incorporated into an interpretative thematic matrix (Appendix C). Whilst we did not obtain any identifiable practice or patient data for the TYA reports, cancers of this type are rare and we did not want to include any details in the matrix that might make the cases appear less anonymous. Therefore, we have included age band rather than actual age at diagnosis for each patient, and we have identified cancers only by type rather than specifically. In addition, we have not included patient gender or year of diagnosis. A synthesis of the data outlined in the matrix is presented in this section. These data relate to the process of care from first presentation with a symptom, and in some instances also include contextual information about presentations in the preceding year. As was the case for lung cancer, the SEA process primarily relates to reflection on care provision, and GPs have focused mainly on what happened following presentation, although some have made additional comment on how long patients tolerated symptoms before presenting.

6.4.1 Initial symptom(s) on presentation

The SEA reports have provided a considerable amount of information regarding patient symptoms seen on initial presentation (Appendix C). Of the 35 cases presented, only two would appear to have had no contact with primary care during the process to diagnosis. Unsurprisingly, initial symptoms often related to the eventual diagnosis. As these reports related to a disparate group of diagnoses in terms of symptom presentation, we felt that it would be more helpful to consider the presentations within five main cancer groups: haematological malignancies (Hodgkin's lymphoma, non-Hodgkin's lymphoma, leukaemia), sarcomas and bone tumours, brain and nervous system tumours, testicular cancer, and melanoma. This leaves four extremely rare cancers which do not fit into any of these categories. These have been considered under the heading 'Other'. Presenting symptoms in each category were as follows:

[1] Haematological malignancies (Hodgkin's lymphoma, non-Hodgkin's lymphoma, leukaemia). Reported symptoms for patients eventually diagnosed with one of these cancers included:

- *symptoms suggesting infection, including cough, sore throat*
- *weight loss*
- *swelling/lump (inc. clavicle, neck, suprasternal area, axilla)*
- *light headedness*
- *flushing and sweats*
- *epigastric tenderness*
- *shoulder pain*

[2] Sarcomas and bone tumours. Reported symptoms for patients eventually diagnosed with one of these cancers included:

- *swelling of calf*
- *pain not settling 6 weeks after fracture of humerus*
- *knee pain (12 month history; 2 month history)*
- *lump in thigh*
- *groin pain*
- *swelling of cheek*
- *chest pain*
- *sinus pain*

[3] Brain/nervous system tumours. Reported symptoms for patients eventually diagnosed with one of these cancers included:

- *visual field loss (attended community ophthalmologist)*
- *back pain and weight loss*

[4] Testicular cancer. Reported symptoms for patients eventually diagnosed testicular cancer included:

- *lump in scrotum*
- *testicular pain*

[5] Melanoma. Reported symptoms for patients eventually diagnosed with one of these cancers included:

- *change in mole*

[6] Others: there were four unusual cancers which did not readily fit into any of these other categories. Interestingly however, in three cases the initial presenting symptoms included neck swelling. Hence, although they were extremely unusual, we are able to draw lessons about the management of young people who present with neck swelling (section 6.4.4.1).

6.4.2 GP response to presentation

The responses made by GPs are summarised in Appendix C. As can be seen, initial responses reflected presentation and preliminary diagnosis made. Thus, at first presentation most patients were examined, examination findings noted, and about one third had blood tests arranged. Many were referred or admitted at the time of initial consultation (Table 5). Other documented responses included referral to another primary care professional (physiotherapist), ultrasound or radiology arranged, arrangement of follow-up review, or patients advised to return if there was no improvement. Other patients were given analgesia for pain, or antibiotics for infection. Many patients were seen more than once in general practice (Table 5). Subsequent response by the GP was determined by the nature of the symptoms; many patients were re-examined, some were then referred.

Table 5 Number of consultations prior to referral for cancers in teenage and young adults

CONSULTATIONS	PATIENTS (%)
1	12 (34.3)
2	9 (25.7)
3	4 (11.4)
4	4 (11.4)
5	3 (8.6)
8	1 (2.9)
unclear	2 (5.7)

6.4.3 Time to referral

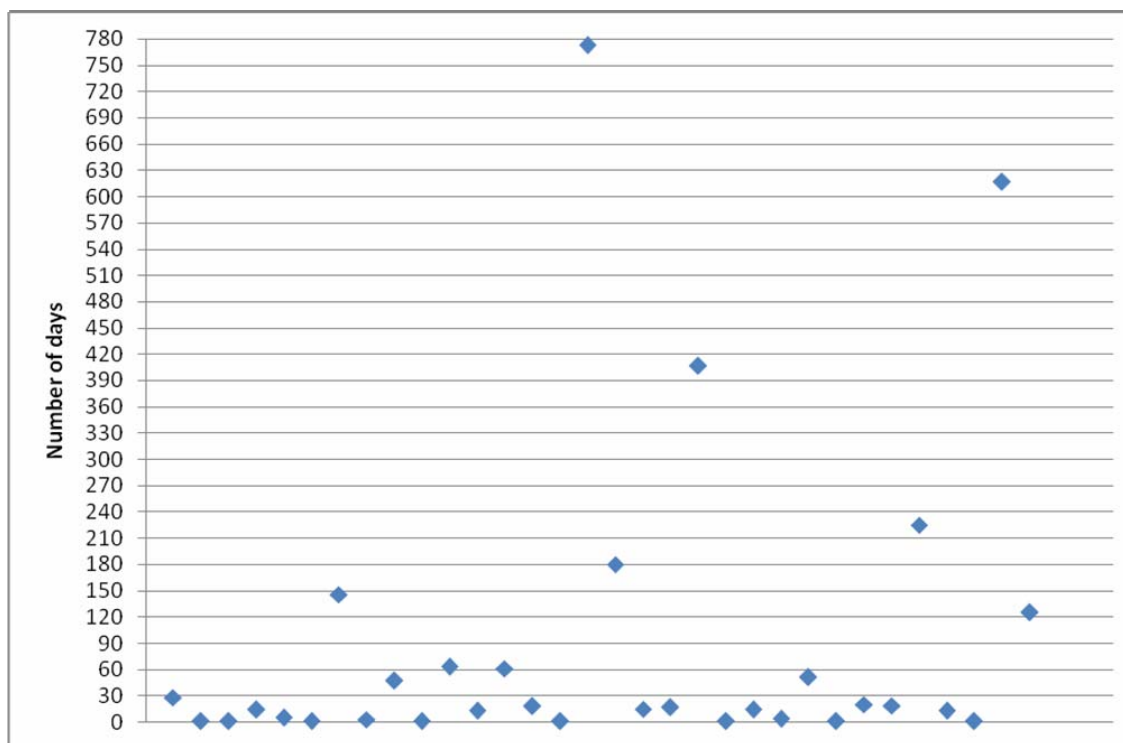
Numerous cancers, encompassing a range of cancer groups were discussed within the SEA reports related to teenage and young adult cancers (haematological, sarcoma and bone tumours, melanoma, brain and nervous system tumours, and testicular cancers). In addition, there was a group of 'other' cancers, four examples of extremely rare cancers either in terms of tumour type or in relation to being diagnosed in the age group concerned. Time interval from initial patient presentation with a relevant symptom to referral was identifiable in the majority reports (91%) (Figure 4). When considered as a whole, this interval ranged from one to 773 days (mean 90 days; median 16 days), and time intervals were also determined by cancer group (Table 6). The shortest intervals were related to melanoma, brain and nervous system and haematological cancer, but regardless of type, two-thirds of all patients were referred within one month of initial presentation.

Table 6: Time to referral for cancers in teenager and young adults by cancer group

CANCER TYPE	DAYS			
	Range	Mean	Median	≤31
All (n=32)	1 – 773	90	16	21 (66%)
Haematological (n=13)	1 – 225	35	14	9 (69%)
Sarcoma/bone (n=8)	1 – 180	56	24	5 (63%)
Melanoma (n=3)	1 – 13	5	1	3 (100%)
Brain/nervous system (n=2)	3 – 15	9	—	2 (100%)
Testicular (n=2)	1 – 146	74	—	1 (50%)
Other – very rare (n=4)	13 – 773	453	512	0 (0%)

* Number relevant / for whom data were available

Figure 4: Time to referral/acute admission for cancers in teenagers and young adults



6.4.4 Understanding referrals for cancer in teenagers and young adults

It was more difficult to decide which presentations to explore in greater depth with the TYA group than with the lung cancer group. As previously described (Section 6.2.5), examining those presentations of lung cancer that took longer than a month to reach referral is a feasible approach in terms of typical and expected presentation. However, the TYA reports

relate to a group of unrelated cancers, which have a different biological and therefore clinical course. Consequently looking at time to referral by a particular cut-off may not be justified. An alternative method, of looking at cancers for which there were repeated contacts in general practice, also has pitfalls, not least because some patients had a number of contacts over a short period, ultimately leading to appropriate referral, whilst others may have had two contacts, but many weeks or months separating these. We have therefore, pragmatically, chosen to consider all presentations within each of the cancer groups outlined above, in order to assess particular issues from the case histories in relation to the process of referral, as a mean of deriving all possible learning points for practice.

6.4.4.1 Presentation related to haematological malignancies

There were 14 SEA reports relating to presentations relating to a haematological malignancy (Hodgkin's, non-Hodgkin's, and leukaemia). These included cases of exemplary practice in diagnosis (Box 4). In these cases, the GP acted on the possible diagnosis at once and carried out the necessary investigations. In addition to these cases, there were other examples of good practice, in which patients were either admitted as an emergency (TYA-22, TYA-26), or were referred after subsequent consultation within a short period of time: TYA-05 (14 days); TYA-06 (5 days); TYA-20 (17 days); TYA-28 (20 days).

BOX 4: Cases of exemplary practice in diagnosing haematological malignancy

Exemplar G: Patient presented with a few day history of sore throat, fatigue and complaining of heavier than usual periods. On examination, a 1cm cervical lymph node was found; bloods (FBC; IM test) were carried out. The haematologist telephone the OOH service later that day with the diagnosis of likely leukaemia and admission was arranged (this was achieved by the OOH service, who managed to find the patient).

Exemplar H: Patient complained of flushing and neck swelling. The GP noted chest signs on examination and arranged a CXR, which was reported the same day as showing a mass. 2WW referral was done.

Exemplar I: Patient presented with a two year history of weight loss, polyuria and thirst. Diabetes was suspected and bloods arranged and taken the next day. Haematologist telephone four days after initial consultation to say blood film was suspicious. The patient also turned out to have diabetes.

Reports of the other haematological malignancies, demonstrated that the diagnosis and referral processes were more challenging. Reasons for this included a combination of symptom related factors, patient related factors and initial diagnosis reached, but in some cases there may have been opportunity for earlier referral. In summary, these cases included:

- TYA-03: Referred at first consultation to ENT for a neck swelling, but as the referral was non-urgent, was not seen at ENT for six weeks. The diagnosis was thought to be a brachial cyst.
- TYA-10: Patient presented with cough and was prescribed antibiotics. Was seen five times before 2WW referral was made at seven weeks. This is a complex case in a patient with co-morbidity despite their age. However, on reflection, it is likely that an opportunity for earlier diagnosis was missed.

- TYA-12: Patient presented with a one week history of a swollen painful neck, which had come on suddenly while exercising, and which was starting to subside by the time of the consultation. The whole of the sternomastoid muscle was swollen. The patient next returned nine weeks later with a distinct neck lump and was referred urgently.
- TYA-25: Patient presented with a one week history of pain in the left axilla, sweats and two day history of a lump. A very small lump was found (<1cm) but there were no other abnormalities on examination. Review was arranged for two weeks time and bloods carried out. The only blood abnormality was a raised LDH. At the two week review, the lump had almost cleared and although the patient said that they were tired, there were social factors to account for that. It was arranged that LDH would be repeated in one month and the patient reviewed in six weeks. At that time, the patient had developed a different painful axillary lump and was referred under 2WW, after discussion with haematologist. This is a complex case, in which the GP was very involved seeking to reach a diagnosis.

6.4.4.2 Presentation related to sarcomas and bone tumours

There were nine SEA reports of bone tumours and sarcoma. In general, the process to referral for these young people was more complex and took longer than the haematological malignancies. Given that the numbers in this study are small, we must be cautious about the generalisability of this finding. However, the process to referral in these cases does demonstrate the variety of symptoms with which bone and soft tissue tumours present, and the particular challenge of diagnosing these in a population who may often engage in active hobbies which may seem to have caused injury, thereby explaining pain.

The SEA reports identified one case of immediate referral in primary care (TYA-07), although in this instance the diagnosis may well have been missed in secondary care. There were several other cases, where although the patient was seen more than once in primary care, the referral was made within a relatively short time period: TYA-15 (2 consults, 18 days); TYA-23 (3 consults, 14 days); TYA-29 (5 consults, 19 days).

There were also some examples where presentation took place in primary care, but the referral process was longer. As was the case with other cancers, there are reasonable explanations for longer time to referral, but the narratives do include some examples where opportunities for earlier referral may have been missed. It is from these cases that we can learn most. Relevant cases for sarcomas and bone tumours included:

- TYA-02: Patient presented with a swollen calf, confirmed on examination, and was seen four times before being referred 28 days after initial consultation. At 28 days, with symptoms worsening, orthopaedic review was arranged by telephone and the patient was seen the next day (this was more than ten years ago, and pre-dates 2WW referral protocols).
- TYA-14: Patient presented with 12 month history of knee pain; an X-ray was arranged and the patient was referred to physiotherapy. The knee X-ray was normal. The patient was seen several times; inflammatory markers were checked and were also normal. The diagnosis was expedited when the patient found a swelling over the right sacroiliac joint. Referred for x-ray same day – x-ray was

abnormal showing sclerotic changes with lysis at right SI joint. This patient would appear to have been suffering from referred pain, which despite the best efforts of the GPs involved to arrive at a diagnosis, did not manifest for some weeks.

- TYA-18: Patient presented with pain in groin which was thought to be due to a football injury, dating back three months. This pain appeared to settle following treatment by Physiotherapy. About 22 weeks after initial complaint with groin pain, they presented to OOH and A&E with sudden onset severe groin pain, and was diagnosed with musculoskeletal pain. This pain failed to settle and the patient was referred to Orthopaedics a few weeks later (exact time not given).
- TYA-27: Patient attended with chest pain (no other details provided), was reviewed 12 days later when a slight improvement was reported. The patient was admitted following an A&E attendance, 55 weeks after initial consultation. From the information provided, it is difficult to determine whether the consultations with chest pain related to the final diagnosis.
- TYA-35: Patient presented with a two month history of knee pain which was thought to be a football injury strain from two months previously; they were next seen two months later, still with pain, still playing football. On both of these occasions, examination was normal, and they were prescribed analgesia. At the third consultation, a further three weeks later, there was now a swelling in the leg and a routine USS was ordered. This was carried out five weeks later and was abnormal, so the radiologist carried out an X-ray and MRI while the patient was in the department.

6.4.4.3 Presentation related to brain and nervous system tumours

There were only two cases in our data of patients with brain or central nervous system tumours. In one case, the process of recognition and referral was exemplary (Box 5). The other case demonstrated appropriate practice under the circumstances described.

BOX 5: Cases of exemplary practice in diagnosing nervous system malignancy

Exemplar J: Patient with learning difficulties presented with back pain and weight loss. The patient was reluctant to be examined and so an appointment with another GP was arranged. At this appointment a large mass was found in abdomen; the patient was referred and a diagnosis made

6.4.4.4 Presentation related to testicular cancer

Three patients with testicular cancer are described in these data; one of which was diagnosed abroad and was simply referred to specialist care when they arrived back in the UK. Of the remaining two, one included a demonstration of exemplary process of recognition, referral and diagnosis (Box 6). The other case was a more difficult one.

BOX 6: Case of exemplary practice in diagnosing germ cell tumour

Exemplar K: Patient presented with a several week history of testicular pain, and on examination had a large tense scrotal swelling. The GP organised an urgent USS which was done the following day; saw the patient and their parents one the same day as the scan, and referred under the 2WW rule

The other testicular cancer took much longer to reach referral (TYA-08). This patient presented with a possible scrotal lump, but it was felt that the patient was feeling the epididymis. The patient then re-presented over four months later with a 2cm swelling which could not be separated from the testicle and so an urgent urology referral was sent.

6.4.4.5 Presentation related to melanoma

Three of the TYA reports related to diagnoses of melanoma (TYA-04, TYA-13, TYA-33). All of these were dealt with appropriately, although in one case the time to diagnosis was longer than expected as the patient was referred urgently to primary care dermatology (took 2 months) before excision and referral to plastic surgery.

In summary, the main lessons than can be drawn from these narratives of presentations and referral of cancer in teenagers and young adults are:

-
1. All neck and axilla lumps should be referred under the 2WW rule.
 2. If immediate referral for neck or axilla lump is not thought clinically indicated (e.g. recent history of infection or trauma), the patient should be given an appointment for review by the GP, rather than told to return "if doesn't settle".
 3. The complexity of presentation of bone tumours and sarcomas.
 4. The need to find a reason for ongoing musculoskeletal pain, particularly if it is of a long duration.
 5. The need to beware of the non-resolving alleged sports injury.
 6. Consider opening up access to urgent referral to specialist clinics to health professionals other than GPs.
 7. The importance of practices being patient-centered in their approach, in order to expedite the diagnostic process.
 8. The usefulness of USS in assessment of testicular lumps.
 9. The need for primary care specialist clinics to operate under 2WW rule if accepting potential cancer referrals.
-

6.5 LEARNING POINTS RELATED TO TYA CANCERS

The learning points described by practitioners in relation to diagnosis and referral of cancers in teenagers and young adults addressed similar themes to those outlined for lung cancer, namely a) presentation and diagnosis of cancer, b) system issues and the primary/secondary care interface, c) patient related factors, d) practitioner issues, and e) the role of guidelines. Given the number of SEAs returned, some of these learning points were

once again identified by single or small numbers of practitioners, but we have included as many as possible given their relevance to individual practices.

6.5.1 Presentation and diagnosis of cancer in young people

The learning points identified within this theme reflected not only how challenging GPs found the presentation and diagnosis of these rare occurrences of cancer, but also that they provided an opportunity for discussion within the practice team. The actual behaviour of some cancers was surprising and it was unclear as to how generalisable those experiences would be to future practice. In addition, some practitioners were reminded of modes of presentation related to particular types of cancer. Specific learning points raised were:

- ❖ Diagnosing cancer in low risk age groups is difficult.
- ❖ Atypical presentation is not uncommon.
- ❖ Cancer is not always suggested by symptoms, or the most likely differential diagnosis in young people.
- ❖ Symptoms of common illness should be investigated if they are persistent or show no improvement.
- ❖ Further investigation should be considered in young patients.
- ❖ Identified educational opportunities in relation to presentation of less common cancers.
- ❖ Provision of new knowledge in relation to possible disease markers and disease progression.

“Reflection reminds us that common minor signs and symptoms may have an underlying serious cause”

“Beware lumps, a diagnosis needs to be established”

“I think this has reinforced the fact that rare conditions can present. Repeated reassurance without further investigation is something we should think carefully about doing”

6.5.2 System issues and the primary/secondary care interface

As was the case for lung cancer diagnosis, many of the learning points and discussion within this theme related to communication, both within and outwith primary care, and with patients. In addition, the importance of continuity of care was emphasised, and the benefit of patients where possible, being asked to consult with the same practitioner, particularly if the initial presentation was unusual. Much consideration was given to how this might be achieved, including with locum doctors. The ways in which blood and ECG tests were carried out and reviewed in practice was discussed, as was the role of the 2WW and how best to access urgent referrals. There was also some concern raised in relation to communication from specialist centres. Detailed learning points identified were:

- ❖ Effective communication and team working is key.

- ❖ Communication from secondary care can sometimes be infrequent.
- ❖ Continuity of care as far as possible is vital.
- ❖ Continuity in those requesting and reviewing investigations aids earlier diagnosis.
- ❖ Good record keeping is important in facilitating different doctors following a case.
- ❖ A lack of continuity of care makes it more difficult to recognise trends in patient symptoms or conditions.
- ❖ Awareness of the 2WW and referral pathways.
- ❖ There is sometimes a need to 'break into' the hospital pathway in order to find out about delays in appointments, delays in diagnosis, or lack of information on treatment plans.

“The importance of team working and maintaining daily meetings to discuss difficult cases was highlighted”

6.5.3 Patient related factors

Whilst less commonly discussed, there was some reflection on relevant patient factors, in particular the difficulties in engaging with and obtaining a diagnosis in this age group, and the reluctance of some young people to seek care. Learning points identified were:

- ❖ It is important to have an appropriate consulting style that would allow young people to feel comfortable enough to explain their symptoms.
- ❖ Communication with particular groups of people may require additional training.
- ❖ If a young person is reluctant to be examined at the time of initial consultation, for whatever reason, they should be seen again.
- ❖ It can be difficult to determine if initial symptoms are relevant to a diagnosis in young patients who may be infrequent attenders.

“The general issues with young people, particularly young males were discussed. They do not tend to present to the doctors and when they do they do not tend to engage well so an appropriate approach to allow them to relax and explain their symptoms is vital”

6.5.4 Practitioner issues

As was found for lung cancer, the main practitioner issue discussed was the importance of vigilance and the need for safety-netting in this age group. Specific learning points were:

- ❖ Safety-netting with adequate recording of information is important.
- ❖ Awareness that over recording can obscure relevant clinical details.
- ❖ Specific safety-netting on time for representation and practitioner to be seen could be helpful.

- ❖ Thorough clinical examination is important (e.g. for lymph nodes).
- ❖ It is important to review previous consultations and ask about previous symptoms where appropriate, even if patient is attending for another issue.
- ❖ It is important to maintain contact with the patient after referral and to follow-up the outcome.
- ❖ It is important to ensure attendance for review following abnormal blood results.

“We learned that we should be more specific about time and location in our safety netting “if the swelling is still there in 4 weeks then come back here to see GP””

“At the first consultation the patient didn’t seem to be examined for 18 months ... this should probably have occurred more frequently”

“It shows that routine blood tests are a very important part of our armoury and in this case if they had not been carried out the diagnosis could have gone unnoticed for some time.....”

6.5.5 The role of guidelines

Practices reviewed their own experience in light of guidelines and the 2WW (considered by many to be a type of guidance), and the role of this was discussed. A significant proportion of the TYA diagnoses (20%) pre-dated the introduction of the 2WW, and some practices reflected on this, as well as on appropriate current referral pathways. Some practitioners reflected on how the 2WW was perhaps inappropriate for some patients, for example those who might be very anxious, in which case urgent investigation to eliminate uncertainty was arranged. Learning points raised by practitioners were:

- ❖ Raised awareness of criteria for urgent or 2WW referral for suspected cancer.
- ❖ Guidelines are less helpful when a suspicion for malignancy is not apparent.
- ❖ 2WW referral is not necessarily best for all patients.

“Perhaps a 2-week wait referral should have been done, though the Dr concerned felt that the situation was more urgent than that.... wanted the patient to be seen ASAP”

“We discussed how NICE head and neck referral guidelines are helpful but how we have referred similar patients who have had a neck node persisting for 4 weeks and we have received “strongly worded” replies from ENT departments saying this was inappropriate referral”

6.6 PRACTICE BASED CHANGES FOR LUNG AND TYA CANCERS

Many practices had already made or put forward suggestions for change based on reflection of the events surrounding the diagnoses reported in the SEAs. As might be expected, the majority related to organisation of practice and patient care, and took account of the main learning points raised including those related to presentation and diagnosis, system issues and communication, use of guidelines, and safety-netting. In the main, changes made can be categorised into three areas: 1) changes at the consultation level, 2) changes at the practice level, and 3) changes at the level of the cancer network. Examples of changes made or planned in each of the three categories are outlined below.

6.6.1 Changes at the consultation level

- Appointment of a lead clinician, responsible for delivering care, for every seriously ill patient in the practice, to encourage continuity and better communication with secondary care; this person will also liaise with all ancillary staff involved.
- Document how long symptoms have been present.
- Ensure review of records, including previous consultations, when seeing patients.
- Individual doctors to review their approach to reviewing clinical notes for previously unresolved issues, especially if the patient consults with different GPs.
- Reflection on what patients are saying rather than just taking this for granted.
- Enquire about patients' general health and follow-up on symptoms, especially if vague.
- Review methods of patient recall and how patients are informed after abnormal CXR results (to minimise delays).
- Engage in an active policy of recording smoking history.
- Advise patients that if a chest symptom does not resolve a CXR would be helpful, and make a record of this.
- Cervical radiculopathy 'red flag' guidance has been made accessible to all clinicians on their computer desktops.
- All patients over 55 with new onset back pain to have blood tests.
- Regular recording of patient weight added to the COPD template.
- CXR for all newly diagnosed COPD patients added to the COPD template.
- Smokers who attend for chronic disease review to be asked about respiratory symptoms; if these are present, the patient will be referred to a GP.
- Need to monitor weight in housebound patients more closely; investigating use of portable scales for that purpose.
- GPs to be available to practice nurses during COPD clinics for discussion of spirometry results and to review new or deteriorating chest signs.
- Patients with wheeze of more than three weeks duration to have further investigation, which should include spirometry and peak flow.
- Consider a lower threshold for CXR in patients with pre-existing chest disease.
- Increased vigilance when dealing with presentations for neck and shoulder pain.
- Haemoptysis to be referred for CXR, even if minor.

- Use stronger safety-netting for patients presenting with neck lumps.
- Consider use of x-rays for persistent groin strain.
- All moles, if changing with possible malignant features, should be referred under the 2WW.

6.6.2 Changes at the practice level

- Practitioners are more aware of guidelines and criteria for review.
- Planning new system to ensure that all NICE guidance relevant to primary care is looked and implemented in the practice.
- All practitioners to receive a copy of the NICE guidelines on diagnosis.
- Minutes will be circulated to all team members not available to attend meetings where cases are discussed.
- Discussion of patients at the monthly cancer care review meeting will include access to notes, in order to highlight outstanding letters etc. (these can then be requested).
- All new cancer diagnoses discussed at regular practice meetings.
- Urgent results to be passed on the same day to the doctor dealing with a case, or in their absence, to the doctor on call.
- Patients will be contacted after DNA letters are received from hospital.
- Development of a practice policy to be followed when patients present with any persistent condition lasting more than three months, including consideration for further investigation; practice to audit process after six months by identifying all entries for 'cough' to make sure that multiple entries have been reviewed by a GP.
- Reviewed scanned hospital information to ensure that this is stored in order and date.
- Prescribing policy has been amended to include ensuring that monitoring bloods are kept up-to-date where needed.
- Validation of patient addresses and telephone numbers.
- Each time a patient has a blood or other test they have to provide an up-to-date phone number.
- Cancer symptom related leaflet displays have been installed outside the consulting rooms.
- As far as possible, patients should see the same GP for an ongoing problem.
- Partners reminded of the need to spend time to meet each day to discuss difficult cases.
- Awareness of where and when to consult guidance on criteria for urgent x-ray.
- More slots have been made available within the phlebotomy service.
- To talk to locums about the patients they are seeing.
- Code added to clinical records to indicate whether a patient has been told results (to facilitate follow-up).

6.6.3 Changes at the level of the cancer network

- Administrative staff to continue to follow-up 2WW referrals; if no appointment is offered to a patient within 24 hours they will follow this up with the appropriate speciality.
- Clearer documentation of GP concerns in admission letters to ensure that these are not missed.
- When using the 2WW system, the code for reason for referral should be added to the referral letter.
- All cancer patients are now run through the practice *Keep Improving the Experience* (KITE) system.
- Audit of results received to measure length of time to reporting for radiology reports, as there can be lengthy delays.
- Use of a 'forward diary' by individual GPs and by the practice as a whole to pick up on reports that have not been sent to primary care.
- Audit of numbers of patients who fail to attend for CXR, along with the indication for CXR.

7. DISCUSSION

Significant Event Audit is a tool designed to assist with and improve patient care within general practices. In this study, we have used SEA reports related to lung and teenage and young adult cancers for the purpose of research. To the best of our knowledge, this is the first time that a project of this type has been undertaken. Consequently, we have been able to draw inferences about the process of diagnosis and referral of these cancers within primary care. One of the particular strengths of these data is, that in addition to providing us with details relating to the process of care prior to diagnosis, we also have reflections from the general practitioners on the circumstances surrounding this, identifying learning points generated along with any changes to practice put in place as a result of the case discussed.

Limitations of study

We have applied a qualitative methodology to a non-representative group of patient reports, and as such, should caution against absolute generalisability of these results. We believe this to be particularly true of the TYA analysis, where there are relatively few reports, but covering a large number of cancers. We would also acknowledge that the SEAs may have been returned by practices where the GPs are more engaged with cancer recognition and referral, and as such, may represent best practice rather than average practice. However, it is true that in any research involving practitioners, there is always the likelihood that those more interested and engaged will take part.

The index consultation related to diagnosis of cancer was not always easy to identify, particularly in patients who consulted relatively frequently. It was clear from some reports that the GPs may have found it difficult to identify the initial presentation, and in some cases this was left to the researchers to decide, as practices provided details on all consultations in the year prior to diagnosis. We felt that the only option open to us was to take the first relevant consultation, and in so doing, it is possible that we have taken a relatively strict approach, which may possibly have resulted in an overestimation of the time to referral in some cases. However, we wanted to ensure that we did not underestimate referral time, and it is clear from the reports that the majority of patients are referred within an acceptable period.

The relevance of presenting symptoms

The symptom(s) with which patients presented were central to the descriptions of the cases and consultations described in the SEAs. As might be expected, chest symptoms were common in patients who went on to be diagnosed with lung cancer. Many practices reflected on how common chest symptoms are in general practice consultations. Contrary to what might be expected however, patients who initially presented with non-chest or malignancy related symptoms were dealt with promptly in most cases, and in all cases were dealt with appropriately. It appears that the challenge with lung cancer presentation is to consider the two, sometimes related problems, of the cough which does not resolve and the CXR reported as normal or with a benign explanation for the appearance. Specific attention to these issues, both in the consideration of further research into presentation with lung cancer, and in guidelines for primary care would therefore be worthwhile. Within this non-representative group, the most common (around half of 130 reports) presenting symptomatology was cough, productive cough and other symptoms suggestive of infection.

Perhaps it is through understanding more about this group of patients in particular that most could be done to reduce the time to referral among lung cancer patients.

Whilst we would caution against drawing broad inferences from our data with respect to the TYA cancers (bearing in mind the relatively small dataset, and the number of different cancers included), the diagnosis of sarcomas and bone tumours appeared particularly problematic, as did diagnosis of the few extremely rare cancers described. While it may be more difficult to make recommendations as a result of a few extremely rare individual cancers, we believe that recognition of bone tumours and sarcomas in general practice may be worthy of more attention, if other data on TYA cancers confirm our findings. Consideration of follow-up within primary care of musculoskeletal pain thought to be injury related may be appropriate, along with follow-up of all lymphadenopathy and lumps until there is complete resolution or until the patient is referred.

System issues

Many system related issues have been raised within this study. Practices reflected on many aspects of good practice which will have had implications for patients in general, not just for those presenting with lung cancer symptoms or TYA cancer related issues. These included practices' own processes for ensuring continuity of care, good record keeping, how test results are dealt with, the role of the practice once referral has been made, and a review of the use of guidelines and the 2WW rule.

Safety-netting

The dominant theme arising from practitioners' reflection on these cases was the need for appropriate safety-netting. This language was common throughout the narratives, and is a very helpful way to consider how patients with potentially significant symptoms are dealt with, both within the consultation and subsequently. One particular safety-netting issue that is relevant for practices generally is when it is appropriate to give patients an appointment for review, and when it is appropriate to tell them to return "*if it doesn't get better*". There were examples, in both the lung cancer stories and the TYA stories, when many weeks passed before the patient re-presented for the second time with the same symptom that they had initially presented with. Guideline developers may want to consider this in future iterations of existing guidelines or development of new referral pathways.

Comparisons between lung and TYA reports

One of the principle differences between lung cancer and TYA cancers is that the former is common in general practice, and the latter rare. However, the differences are greater than that. Symptoms that may be an early indicator of lung cancer are very common; most patients having such symptoms have an infective episode with no underlying sinister diagnosis. Therefore, the challenge for the GP is to determine which of these many episodes are worthy of further investigation. Cancers in teenagers and young adults on the other hand are rare, and the symptoms with which patients present are also relatively rare. However, even within this group, two of the more common symptoms of lymphadenopathy and bone pain, as presenting features of lymphoma or bone tumours are frequently explained by infection, or sports or activity related injury. Thus, it would appear that the common issue related to both of these groups is to address non-resolving symptoms. As many practices reflected in their narratives, both for lung and TYA, there is a need for

mechanisms to be put in place to ensure that such symptoms will be followed-up and referred appropriately.

For both patients with potential lung cancer or a TYA cancer, there is a need for the patient's symptoms to be considered in context. Thus, the relevant context of smoking and COPD is pertinent when considering chest symptoms, although practitioners also need to be aware of the less common lung cancers occurring in non-smokers. For young people, the challenge for the practitioner is to pick up the once-in-a-lifetime diagnosis of a cancer in this age group. However, consultations in this group are not common, once reproductive and mental health issues are excluded. The main issue for practitioners therefore, is to be aware of non-resolving symptoms attributed to injury or infection.

It is interesting that there was little hesitation by practitioners in referring patients with unusual presentations of lung cancer, but considerable time to referral for some patients with highly unusual TYA cancers. This may reflect that cancer is a differential diagnosis in many consultations with older patients, but is not at the top of the differential diagnosis list when dealing with young people.

This was also demonstrated in relation to how GPs reflected on the cases and described their learning as a result of it. They were frequently unsure about the benefit of learning from the TYA process as it was so unlikely to happen again, and if it did, the likelihood was that the presentation would be very different. However, there was a clear advantage to reflecting on lung cancer recognition and referral, and whether or not that was being done appropriately within their practice, as that would undoubtedly benefit future patients.

Relevance for patients

While this was a study of primary care recognition and referral of patients with lung cancer and TYA cancers, many of the SEA reports also included reflection on how the actions of the patient had potentially impacted on the process. There were, for example, a number of patient factors identified in the lung cancer reports (Section 6.2.5.1). It appears that the messages for patients from this study are 1) to ensure that they understand the plan for follow-up plans if their symptoms do not get better, and 2) that the process to diagnosis for any given condition may involve more than one visit to their GP. There is also scope for education of patients at a particular risk of lung cancer (such as smokers and those with relevant occupational exposures), in order to encourage earlier presentation with ongoing and new chest symptoms.

The way forward

Based on these observations, we would therefore suggest a difference in approach in considering lung and TYA cancers and attributing 'red flags' to presentations. For lung cancer, it is appropriate that these red flags relate to symptoms and context (smoking, occupational history). For TYA cancers (apart from the well known presentation of lump) they may relate more to the non-resolving symptom. In order to diagnose this appropriately, it may be prudent for GPs to consider the mechanisms of follow-up of new symptoms and whether giving young people appointments to return might make it more likely they will return, rather than asking them to negotiate the appointments system again.

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9. GLOSSARY

2WW	2 week wait	MDT	Multidisciplinary team
A&E	Accident and emergency	MRI	Magnetic resonance imaging
ACEi	Angiotensin converting enzyme inhibitor	MSU	Mid-stream specimen of urine
AF	Atrial fibrillation	NAD	No abnormality detected
ARB	Angiotensin receptor blocker	NICE	National Institute for Health and Clinical Excellence
C/O	Complaining of	NPSA	National Patient Safety Agency
CA125	Cancer antigen 125	NSAIDS	Non-steroidal anti-inflammatory drugs
CEA	Carcinoembryonic Antigen	OOH	Out of hours
CHD	Coronary heart disease	OTC	Over the counter
Cigs	Cigarettes	PLID	Prolapse of lumbar intervertebral disc
COPD	Chronic obstructive pulmonary disease	PMH	Past medical history
CT	Computerised tomography	PPI	Proton pump inhibitor
CVD	Cerebrovascular disease	PVD	Peripheral vascular disease
CXR	Chest x-ray	QOF	Quality and Outcomes Framework
DNA	Did not attend	RIF	Right iliac fossa
Dx	Diagnosis	Rx	Prescription
ECG	Electrocardiogram	SEA	Significant Event Audit
EMIS	Egton Medical Information Systems	SI	Sacro iliac
ENT	Ear nose and throat	SOB	Shortness of breath
FBC	Full blood count	SVCO	Supra vena cava obstruction
FTA	Failed to attend	TB	Tuberculosis
GGT	Gamma-glutamyl transferase	TIA	Transient ischaemic attack
GI	Gastrointestinal	TWR	Two week rule
H pylori	Helicobacter pylori	TYA	Teenage and young adult
H/O	History of	UCT	Urgent Care Team
IHD	Ischaemic heart disease	URTI	Upper respiratory tract infection
IM	Infectious mononucleosis	USS	Ultrasound scan
Ix	Investigation	UTI	Urinary tract infection
MCV	Mean cell volume		

Appendix A:

Significant Event Audit Report Template

**North of England Cancer Network
Cancer Diagnosis Significant Event Audit (SEA), 2009
REPORT TEMPLATE**

Diagnosis	
Date of diagnosis	
Age of patient at diagnosis	
Is the patient currently alive? (if not alive, please give date of death)	
Date of SEA meeting	

1. What happened?

Describe the process to diagnosis for the patient, including dates of consultations, referral and diagnosis. Consider, for instance, the key consultation at which diagnosis was made, consultations for this patient in the practice in the year prior to diagnosis and the referral process. How often had the patient been seen? Had he/she been seen by the out of hours service, at A&E or in secondary care clinics? Was there any delay on the part of the patient in presenting with their symptoms?

2. Why did it happen?

Reflect on the process of diagnosis. Was this as good as it could have been? If so, what were the factors that contributed to speedy and /or appropriate diagnosis in primary care? If there was some delay in diagnosis, what were the underlying factors that contributed to this? Were reasons for any delay acceptable or appropriate?

3. What has been learned?

Describe the discussion at the team meeting. Demonstrate that reflection and learning have taken place on an individual or team basis and that relevant team members have been involved in considering the process of diagnosis. Consider, for instance: a lack of education or training; the need to follow systems of procedures; the importance of team working or effective communication. Consider the role of the NICE Referral guidelines for suspected cancer and their usefulness to primary care teams.

Appendix B:

Lung cancer – Interpretative matrix for process of referral

LUNG CANCER – INTERPRETATIVE MATRIX FOR PROCESS OF REFERRAL

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-01 (74)	"Cough and chesty", with green sputum	Prescribed antibiotics; advised return if no improvement	(1) few creps R base lung; (2) creps L base; (3) less creps, more wheeze	CXR	None reported	2WW referral to respiratory clinic (4 consults / 15 weeks)	On CXR (1° care)	COPD; recent ex-smoker	Next presented 11 weeks after initial consult; no detail on previous presentations
L-02 (59)	4-5 week h/o chest tightness, SOB, feeling tired	Acute bronchitis diagnosed; started antibiotics and steroids; planned review 7 days	None reported	None reported	None reported	Emergency admission by GP (2 consults / 4 days)	In-patient investigation (<i>malignant pleural effusion</i>)	Anxiety; depression	3 previous non-chest related consults
L-03 (61)	Inco-ordination of legs when walking, increased urinary frequency	Thought side effect of Dihydrocodeine	(1) Straight leg test was 80° bilateral, tender upper/lower thoracic spine	None reported	None reported	Emergency admission by GP (2 consults / 5 days)	In-patient investigation (<i>metastatic adenocarcinoma with bone mets</i>)	Atypical pneumonia; R lung biopsy; sleep apnoea syndrome; cryptogenic organising pneumonitis, ex-smoker	Attended 17 weeks earlier with acute back pain, was referred to rheumatology CXR showed <i>normal lung field</i>
L-04 (79)	C/o of SOB at hypertension review with practice nurse	Referred to nurse practitioner for assessment	None reported	Spirometry reversibility; CXR; bloods	None reported	Emergency admission by GP (4 consults / 36 weeks)	In-patient investigation (<i>CXR confirmed lung cancer</i>)	Hypertension; smoker	Initial CXR normal; next presented 35 weeks after nurse practitioner consult; attended for regular hypertension reviews
L-05 (30)	C/o lower back pain and polyarthritis	Bloods taken and abnormal; admitted as emergency with swelling calf, query DVT	None reported	Bloods; repeat bloods x 2	GP faxed chest physician for advice (8 consults / 6 weeks); seen in chest clinic, CT scan arranged	Urgent referral rheumatology (4 consults / 10 days); emergency admission by GP (5 consults / 13 days)	On CT scan chest and abdomen (<i>likely lymphoma; samples suggest metastatic non small cell carcinoma</i>)	None reported	8 previous non-chest related consults; discharged from hospital twice before diagnosis
L-06 (72)	URTI symptoms with increasing cough; associated R-sided chest pain worse on movement/coughing	Prescribed antibiotics and analgesia; review appointment arranged with same GP	(1) tenderness over anterior chest wall, R upper zone creps with good air entry; (2) persistent R upper zone creps	CXR	CXR report faxed to surgery	2WW referral to chest clinic (2 consults / 17 days)	On CXR (1° care)	Hypertension; vertigo; smoker (8 cigs per day)	No complaint of chest symptoms in year prior to diagnosis

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-07 (62)	1 week h/o cough	Treated as viral infection; smoking cessation advice given	(1) chest clear; (2) localised chest wall tenderness, and acromioclavicular joint; (4) slight R-sided wheeze; (5) L basal and mid zone creps, no wheeze	Spirometry reversibility (patient DNA)	None reported	Emergency admission by GP (7 consults / 63 weeks)	In-patient investigation (<i>multiple pulmonary embolism and right hilar mass</i>)	Smoker	Next presented 22 weeks after initial consult; review offered at C5 if deteriorating, next presented 6 weeks later; DNA spirometry
L-08 (80)	2 day h/o cough	Prescribed antibiotics	(1) L basal creps; (2) chest clear	Spirometry; CXR; bloods; repeat CXR; bloods	Repeat CXR report faxed to surgery, <i>CT thorax being arranged</i>	Routine referral to chest clinic (5 consults / 39 weeks)	On CT thorax (<i>cavitating and speculated L hilar mass</i>)	None reported	Initial CXR compatible with infection; repeat CXR unchanged (patient DNA initial rpt appointment); no detail on previous presentations
L-09 (75)	Hoarse voice	Treated; planned review 8 days	None reported	CXR	None reported	2WW to ENT (2 consults / 21 days)	On CXR (1° care)	None reported	Laryngeal and bronchial cancers; weight loss, haemoptysis, breathlessness all denied at consult; no detail on previous presentations
L-10 (78)	Cough	Prescribed antibiotics; follow up arranged	None reported	Spirometry; sputum culture; spirometry	Attended A&E for cough and eye infection (31 days after initial consult)	Emergency admission by GP (4 consults / 12 weeks); emergency admission by GP (5 consults / 22 weeks)	In-patient investigation (<i>unclear how</i>)	COPD; renal disease	Patient attended secondary care weekly (x3) for dialysis; 4 unsuccessful attempts to contact by phone
L-11 (46)	R axillary chest pain	Sounds musculoskeletal; reassured by GP	None reported	CXR	None reported	2WW to chest clinic (2 consults / 5 weeks)	On CXR (1° care)	Never smoker	6 non-chest related consults in previous year; GP mainly concerned with cardiovascular risk
L-12 (74)	Chest pain, coughing up green sputum	Prescribed antibiotics	(1) hyperinflation and L base creps	CXR	Seen by OOH for worsening chest pain (3 days after initial consult)	2WW to chest clinic (5 consults / 17 days)	On CXR (1° care)	Smoker	1 non-chest related consult in previous year

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-13 (90)	4 day h/o tender swelling on anterior chest wall	Metastatic nodule considered, but tenderness suggested infection; prescribed antibiotics	(1) nodule 1 inch in diameter; (3) nodule enlarged	CXR (following reluctance for biopsy)	Attended dermatology clinic (found consult very unpleasant, reluctant to proceed with biopsy)	2WW to dermatology for biopsy (3 consults / 6 weeks)	On CXR (1° care)	Smoker	Referral discussed at C2 and deferred at patient's request; no previous relevant consults
L-14 (50)	1 month h/o dry cough	Prescribed steroids; CXR arranged	(1) Scattered crackles and wheeze, nil focal; (2) R basal crackles	CXR; repeat CXR; bloods	None reported	2WW to chest clinic (2 consults / approx 21 days)	On repeat CXR (1° care)	Asthma; ex-miner; recent ex-smoker	Initial CXR compatible with infection; 3 consults in previous year (asthma monitoring, smoking cessation advice)
L-15 (58)	Epigastric pain, mainly at night (coincided with taking ibuprofen for low back pain)	Prescribed analgesia and PPI; advised to reduce and stop smoking; bloods arranged	(1) Abdomen normal, steady weight, no bowel changes	Bloods; USS abdomen	None reported	2WW referral gastroenterology (3 consults / 6 weeks)	On USS (<i>multiple focal lesions both lobes of livers, suggestive of metastasis</i>)	Smoker	No presentations in previous year; denied alcohol intake (GGT raised at 591 then 631)
L-16 (70)	Sudden onset unsteadiness of feet, impaired co-ordination of lower limbs	Possible cerebella lesion, referred TIA clinic	None reported	None reported	None reported	Urgent referral TIA clinic (initial consult)	On CT scan (<i>cerebral metastases, R middle lobe cancer</i>)	Hypertension; high cholesterol; ex-smoker	Attended surgery every 3 months for BP check; annual cholesterol
L-17 (79)	Subcutaneous swelling of chest wall (just noticed by patient)	Referred surgical clinic; advised to watch for changes or new lesions and contact surgery	(1) Swelling 2cm in diameter and tender	None reported	None reported	Routine referral surgical clinic (initial consult)	On biopsy (<i>cancer bronchus</i>)	Cervical spondylosis; ex-miner; smoker (20 cigs per day)	Two further lumps developed by clinic appointment (25 days later); no detail on previous presentations
L-18 (50)	Few months h/o of persistent L scapular pain after a fall (patient taking OTC NSAIDS, assumed fall cause of pain)	Examined; CXR and bloods arranged	(1) Shoulder unremarkable, chest clear, no subcutaneous nodes, mild exophthalmos but no tremor; patient very thin, admitted weight loss	CXR; bloods	Initial CXR showed <i>COPD changes, recommended routine referral</i>	Routine referral chest clinic (1 consult / 12 days)	On CT scan	COPD (diagnosed during process); smoker (recently re-started);	Patient not previously seen at practice prior to initial presentation

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-19 (58)	Impaired circulation little toe, R shoulder pain, generalised joint pains	None reported	None reported	None reported	Attended vascular clinic, now dry gangrene, for MRI angiogram (7 weeks after initial consult); attended A&E with worsening circulation L foot and admitted (8 weeks after initial consult)	Referral vascular surgeon (2 consults / 7 days)	In-patient investigation (CXR showed lung tumour with metastases)	Vertigo; PVD; smoker	little detail on previous presentations; no symptoms pointing to a chest condition
L-20 (64)	7-10 day h/o low back pain and sciatica, also felt unsteady	Prescribed analgesia; probable PLID diagnosed	None reported	None reported	Attended neurology clinic (tremor affecting L hand, spreading up arm then to L leg), admission arranged for investigation (6 weeks after initial consult)	Referral neurology (2 consults / 12 days); referral general medicine (3 consults / 18 days)	In-patient investigation (CT scan showed frontal lobe lesion, R hilar mass)	None reported	No detail on previous presentations; presented with symptoms from brain metastases
L-21 (68)	2 week h/o feeling lump in throat when swallowing, some numbness in trigeminal region	Bloods arranged; referred ENT clinic	None reported	Bloods; CT scan	Attended ENT clinic, referred for CT scan head and thorax and barium swallow (2 days after initial consult)	2WW ENT clinic (initial consult); urgent referral respiratory (post CT scan / 20 days)	On CT scan head and thorax (probably L helium neoplasm with no evidence of mets)	Non-smoker	No chest related consults in previous year; no past history of lung related disease
L-22 (69)	Wheeze and productive cough	Prescribed antibiotics and steroids	None reported	CXR	None reported	Routine referral chest clinic (4 consults / approx 8 weeks)	On CT scan (peripheral bronchogenic carcinoma)	COPD; ex-smoker	Initial CXR normal
L-23 (68)	Home visit requested by friend, patient denies and problems	Examined; no further action	(1) chest normal, eating ok, no weight loss; (2) found to be in atrial fibrillation	None reported	Patient attended TIA clinic (31 days after initial consult), practice received hand written fax with cancer diagnosis; did not receive results of investigations or respiratory referral details	Urgent referral stroke clinic (2 consults / 16 days)	On CXR (non small cell carcinoma of lung)	COPD; ex-smoker (40 pack year)	Little practice contact except annual COPD monitoring; patient had brain mets
L-24 (53)	3 week h/o sore throat, slight hoarseness and cough	For review if not settling (CXR considered at consult but not requested)	None reported	CXR; urgent CT scan	None reported	2WW referral chest clinic (2 consults / 29 days)	On CXR (1° care)	Smoker	Patient had recent dental infection; no previous consults related to lung diagnosis

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ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-25 (63)	Few month h/o loose sounding cough associated with hoarseness	Prescribed antibiotics; CXR arranged	None reported	CXR	None reported	2WW referral chest clinic (2 consults / 6 days)	On CXR (1° care)	Heavy smoker	No previous complaints of respiratory symptoms
L-26 (70)	Persistent productive cough with yellow sputum	Prescribed antibiotics	None reported	CXR	None reported	2WW referral chest clinic (2 consults / 5 weeks)	On CXR (1° care)	Passive smoker	No presentations in previous year; previous occupation as respiratory sister had brought up diagnosis of ?TB
L-27 (71)	Lymphadenopathy (only recently noticed by patient), pain in arm, indigestion	Simvastatin discontinued	(1) small well defined lymph node L side of neck	CXR; bloods	None reported	2WW referral ENT clinic (2 consults / 24 days)	On CT neck abdomen and chest (<i>lesion R lung apex</i>)	Alzheimer's disease	Initial CXR showed cardiac enlargement and pulmonary congestion; seen in breast clinic for L breast pain (44 weeks before initial consult)
L-28 (74)	—	GP noticed that inflammatory markers had been rising and HB falling for 6 months	—	—	GP wrote to rheumatology consultant; clinic appointment brought forward, and investigations carried out; referred on to respiratory	—	On CXR (<i>mass R upper lobe</i>)	Nodular rheumatoid arthritis; pulmonary fibrosis; hypertension; hypothyroidism	Picked up by review of blood results being copied to the practice from secondary care
L-29 (74)	Cough and haemoptysis	CXR arranged	None reported	CXR; repeat CXR	None reported	2WW referral chest clinic (2 consults / approx 14 weeks)	On repeat CXR (1° care)	Smoker	Initial CXR normal; no presentations in previous year; seen at smoking clinic only; next presented approx 14 weeks after initial consult
L-30 (52)	Cough, SOB and fever	Prescribed steroids	(3) ? abdominal mass felt and back pain	CXR	None reported	Emergency admission by GP (3 consults / 13 days); referral physiotherapy (4 consults / 21 days); 2WW referral chest clinic (7 consults / 29 days)	On CXR (1° care)	Depression; anxiety; diabetes; smoker	15 consults in previous year, inc. 1 for feeling chesty, 1 tired all the time; patient died 7 weeks after initial consult

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-31 (57)	1 week h/o bilateral pleuritic pain, no cough (attended A&E previous day; given analgesia)	Review of pain; better with analgesia	(3) chest clear, abdomen soft non-tender, also poor appetite, anergic, weight loss 1 month	None reported	Letter from A&E attendance (1 day before initial consult) <i>ECG, CXR, bloods, Amylase all NAD</i>	2WW referral physician (3 consults / 15 days); emergency admission by GP (4 consults / 17 days)	In-patient investigation (<i>CT thorax abdomen and pelvis showed irregular spicular mass anterior L lobe</i>)	PVD; hypertension; smoker	No detail on previous presentations; diagnosis made on admission, before chest clinic visit
L-32 (82)	3 week h/o upper abdominal pain with radiation to back, dysphagia, no regurgitation	Suspected upper GI malignancy, referred gastroenterologist	(1) tender liver organomegaly, poor appetite, weight loss, anergia 6 weeks	None reported	None reported	Urgent referral gastro (initial consult)	At GI clinic (<i>unclear how</i>)	Hypertension; PVD; diverticular disease; ex-miner smoker	No detail on previous presentations; has <i>metastatic (mediastinal LN) lung cancer</i>
L-33 (82)	Exacerbation of COPD, worsening breathlessness	Examined	(1) scattered wheezes, no focal signs in chest	None reported	Admitted as emergency via A&E, COPD exacerbation, CXR, sputum cytology done, referred chest clinic (6 days after initial consult); discharge letter stated <i>CXR changes L mid zone, ?small shadow signs of infection, repeat in 6 weeks to assess R sided lesion</i>	Referral chest clinic (3 consults / approx 11 weeks)	In-patient investigation (<i>indicative of lung neoplasm</i>)	COPD; CVD; hypertension; atrial fibrillation	Consulted approx monthly with range of symptoms; reluctant to be referred; DNA chest clinic post A&E admit; clinical rather than histological diagnosis made due to poor respiratory reserves
L-34 (67)	Tired and breathless	Examined; CXR arranged	(1) suspicion of raised glands in neck and axilla	CXR	None reported	2WW referral chest clinic (no timescale given / 18 days)	On CXR (1° care)	Bladder carcinoma in-situ; ex-smoker	15 consults in previous year for other conditions; practice had little communication from hospital until serious diagnosis notification 8 months later

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-35 (74)	Pre-assessment review with Healthcare Assistant, noted patient was coughing a lot	Query due to medication (Ramipril)	None reported	Bloods; repeat bloods	Seen at Walk-in Centre with 3 day h/o itchy rash, advised stop Candesartan; CXR from General Medicine OP showed <i>dense L helium, could be vascular or tumour, advised referral to chest physician</i> (35 weeks after initial consult)	Referral chest clinic (11 consults / 35 weeks)	On CXR	CVA; depression; smoker	Previous CT scan from General Medicine showed <i>incidental findings</i> (40 weeks before abnormal CXR); little detail on previous presentations
L-36 (61)	Neck pain with nausea	Bloods arranged	None reported	Bloods; repeat bloods x 2	Attended GI clinic for dyspepsia and nausea, CT scan showed <i>large R adnexal solid soft tissue mass arising R ovary</i> (34 weeks after initial consult); attended gynae oncology clinic, CT abdomen and chest showed <i>features suggestive of pulmonary malignancy R upper lobe</i>	Referral gastroenterology (11 consults / 17 weeks); urgent referral gynaecology (13 consults / 34 weeks)	On CT scan	Diabetes; ovarian cancer; ex-smoker (25 cigs per day)	Incidental diagnosis on investigation for ovarian cancer (39 weeks after initial consult); little detail on previous presentations
L-37 (83)	—	—	—	—	Admitted as emergency (unclear if GP arranged admission) for suspected UTI, routine CXR <i>abnormal</i>	—	In-patient investigation (on CXR <i>possible R mid zone pathology</i>)	None reported	Regular attender (every 6-weeks) before/after admit, no relevant symptom; practice did not receive discharge letter or CXR result, despite requesting this; CXR received 13 weeks later with repeat arranged; next communication 7 weeks later

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-38 (75)	Chest pain	Pain not typical of heartburn, cardiac or muscular pain; CXR arranged	None reported	CXR; bloods	Attended A&E with L-sided chest pain; CXR reported as <i>nil focal; muscle sprain diagnosed</i> (8 days after initial consult)	2WW referral chest clinic (2 consults / 22 days)	On CXR (1° care)	Ex-smoker	No chest related consults in previous year
L-39 (69)	Coughing up blood, weight loss	Urgent CXR arranged	None reported	CXR	GP requested urgent appointment with chest physician; rang nurse practitioner at chest clinic, advised <i>no beds and to send patient to A&E for urgent assessment</i>	Emergency admission by GP (2 consults / 5 weeks)	On CXR (1° care)	COPD; diabetes; smoker	Poor attendee at routine COPD / diabetic checks; had cough with little phlegm but streaks of blood 11 months before initial consult; attended for CXR after 5 weeks
L-40 (73)	Cough and wheeze	Prescribed antibiotics and steroids; advised to return if no improvement	None reported	CXR	None reported	2WW referral chest clinic (2 consults / 20 days)	On CXR (1° care)	Alcoholic cirrhosis (in remission); asbestos exposure; chest problems; smoker	No detail on previous presentations
L-41 (78)	—	—	—	—	Admitted following a fall and left NOF fracture; x-ray pelvis and chest on admission; moved to different hospital for rehabilitation	Referred on to chest physician by consultant on review of notes (7 weeks after discharge from second hospital)	On CXR	None reported	No detail on previous presentations; abnormal CXR only picked up on review of notes
L-42 (74)	Weight loss, sweating, R-sided chest pain	CXR and bloods arranged	(1) decrease air entry R base; abdomen soft NAD	CXR; bloods	Following CXR (<i>R basal pleural effusion with consolidation middle lobe</i>), GP called respiratory consultant for advice re: admission; <i>advised antibiotics and refer</i>	Urgent referral chest clinic (initial consult / 5 days)	On CXR (1° care)	Asbestos exposure; smoker;	No detail on previous presentations; not diagnosed until 21 weeks after first OP visit

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-43 (72)	3 week h/o productive cough	CXR arranged	None reported	CXR; repeat CXR; urgent CT chest	Contacted on day of initial CXR re: <i>significant changes L upper lobe; advised antibiotics and repeat in 4 weeks; repeat CXR advised urgent referral CT chest; fast-tracked to chest clinic by CT dept (7 weeks after initial consult)</i>	Urgent referral CT scan (3 consults / 27 days)	On CT scan (<i>abnormal</i>)	Diabetes; IHD, polyarthritis; smoker	Patient declined referral to chest clinic at C2, 7 days after initial consult; 16 non-chest related consults in previous year
L-44 (80)	Attended for routine hypertension check	Query diagnosis of atrial fibrillation; CXR arranged	(1) irregular pulse, feels well, no chest pain or shortness of breath	CXR	None reported	2WW referral chest clinic (initial consult / 6 days)	On CXR (1° care)	Hypertension; smoker	5 consults in previous year, inc. 1 for chest infection, 1 for cough, and 1 for bronchitis
L-45 (51)	Diarrhoea following holiday, also chesty cough (had antibiotics whilst on holiday 2 weeks earlier)	Reassured; advised to return if no improvement	None reported	CXR	Surgery notified CXR abnormal with <i>possible malignancy R upper lobe</i>	2WW to chest clinic (2 consults / 21 days)	On CXR (1° care)	Heavy smoker (up to 80 cigs per day)	Seen with bronchitis 35 weeks before initial consult; had reduced smoking slightly; attended nurse smoking clinic
L-46 (77)	Seen by DN at request of wife and carers, worried re: weight loss and poor appetite	Refused GP consultation; bloods arranged	(2) ? dullness L left base; pale and thin	Bloods; CXR	None reported	2WW referral chest clinic (3 consults / 14 days)	On CXR (1° care)	CVA; CHD	Seen 28 weeks earlier for CHD monitoring, nil of note
L-47 (83)	Increased dysphonia, weight loss	Examined and CXR arranged	(1) reduced air entry L	CXR	None reported	2WW referral physician (initial consult)	On CXR (1° care)	CHD; left ventricular systolic dysfunction; pipe smoker (2oz per week)	Presented 3 times in previous 3 weeks for chest infections; no other information given
L-48 (60)	Cough, watery phlegm	Examined and CXR arranged	(1) creps at L base	CXR	CXR report received same day	2WW referral (initial consult / 6 days)	On CXR (1° care)	Heavy smoker (40 cigs per day)	No chest related consults in previous year
L-49 (57)	Upper respiratory tract infection	Given advice	(1) chest clear; (2) chest clear	CXR	CXR report received next day	2WW referral (3 consults / 10 weeks)	On CXR (1° care)	Ex-smoker	In secondary care, patient stated had cough for 6 months; no detail on previous presentations
L-50 (87)	3 day h/o weakness L hand and arm	Examined; admitted as emergency	(1) apical fullness, ? apical mass on L side	None reported	None reported	Emergency admission by GP (initial consult)	In-patient investigation (<i>on CT scan</i>)	None reported	6 non-chest related consults in previous year

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ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-51 (69)	Cough and sputum, thought had lost weight	Prescribed antibiotics; CXR arranged	(1) L basal signs	CXR	Attended Urgent Care Team with 8 day h/o cough, L posterior chest pain; advised continue analgesia (23 weeks before initial consult)	Fast track referral (initial consult / 5 days)	On CXR (1° care)	Smoker (3 cigs per day)	3 non-chest related consults in previous year
L-52 (73)	—	—	—	—	Attended A&E with chest pain; suspicious CXR, 4 week h/o cough and weight loss; admitted	—	On CXR (<i>R upper lobe pneumonia with likely underlying malignancy</i>)	Poor memory	1 non-chest related consult in previous year; patient is in residential care
L-53 (85)	Weight loss (1 stone), time period unclear	Examined; CXR and bloods arranged	(1) examination unremarkable	CXR; bloods	Radiology report commented <i>R upper zone opacity</i> also seen on CXR and CT scan 7 years earlier, but no films for comparison; <i>suggested referral to chest physician</i>	2WW referral to chest clinic (2 consults / 20 days)	On CXR (1° care)	None reported	Very active, fit patient who rarely visits surgery; no detail on previous presentations
L-54 (80)	Cough and haemoptysis	Prescribed antibiotics for chest infection	None reported	Bloods	Admitted to hospital being generally unwell (unclear if GP arranged admission; 8 weeks before initial consult)	Emergency admission by GP (5 consults / 16 days)	In-patient investigation (<i>unclear how; CXR on earlier admit (suggestive of bilateral hilar shadows)</i>)	IHD; PVD; urinary retention; hyponatraemia	Number of unrelated presentations in previous year
L-55 (80)	—	—	—	—	Seen by UCT with h/o chesty cough, air sats 84%; admitted; UCT telephoned practice with information	—	In-patient investigation (<i>unclear how; lung cancer with probable liver metastases</i>)	Stroke; acute renal failure; ex-heavy smoker	No respiratory symptoms or other symptoms suggesting potential lung cancer in recent history; discharge fax unreadable, request made for more information
L-56 (76)	3 month h/o cough	CXR arranged; referred ENT clinic	None reported	CXR; repeat CXR x 2	Radiology suggested <i>further opinion needed after second repeat CXR</i>	2WW referral chest clinic (no timescale given / approx 18 weeks)	On repeat CXR (1° care)	None reported	Seen twice with respiratory symptoms in year of diagnosis; initial CXR was abnormal but inconclusive, repeated x2 over approx 18 weeks

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ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-57 (57)	Shortness of breath not better	Query diagnosis of pneumonia; admitted as emergency	(1) focal L lower zone sounds	None reported	Attended OOH with 3 day h/o SOB; query infective asthma exacerbation; prescribed antibiotics and steroids (3 days before initial consult); attended A&E as still unwell, re-admitted (5 days after initial consult)	Emergency admission by GP (initial consult)	On USS (<i>pericardial tamponade</i>); CT scan confirmed lung cancer	Asthma; PVD	4 consults in previous year, inc. 1 for infective exacerbation of asthma (approx 33 weeks before initial consult)
L-58 (63)	Recurrence of productive cough	Prescribed antibiotics	None reported	CXR; repeat CXR	Initial CXR report advised <i>repeat in 6 weeks</i> ; repeat CXR report faxed to practice advising <i>2WW referral</i>	2WW referral chest clinic (4 consults / 9 weeks)	On repeat CXR (1° care)	Ex-smoker	No documentation of presentation with chest symptoms in previous years; patient told in clinic confident no cancer; diagnosed 39 weeks after referral
L-59 (68)	1 week h/o cough with blood stained sputum	No other red flags; CXR arranged	None reported	CXR	None reported	2WW referral (initial consult)	On CXR (1° care)	COPD; ex-smoker	Seen for annual COPD review approx 33 weeks before initial consult; no presentations since
L-60 (63)	Painful leg	Query diagnosis of DVT; admitted as emergency (diagnosis confirmed)	None reported	None reported	Admitted to hospital following collapse; CXR then was <i>normal</i> (approx 17 weeks before initial consult)	Emergency admission by GP (initial consult)	In-patient investigations (<i>metastatic lung cancer</i>)	None reported	No presentation to practice in approx 45 weeks prior to admission; referred under 2WW (cough and weight loss) 14 months before initial consult (CXR <i>normal</i>)
L-61 (78)	Tiredness, lethargy, dry skin, hair falling out	No chest symptoms; document weight loss (3kg); CXR and bloods arranged	None reported	CXR; bloods	CXR report suggests <i>urgent referral chest physician</i>	2WW referral chest clinic (initial consult / 5 days)	On CXR (1° care)	Smoker	No respiratory symptoms documented in previous year except for 'a cold'
L-62 (78)	Cough (telephone consult)	Prescribed antibiotics	(2) chest clear, no gland, hypertension review and AF check	CXR	None reported	2WW referral chest clinic (2 consults / 14 days)	On CXR (1° care)	Hypertension; stroke; atrial fibrillation; diabetes; asbestos exposure	9 non-chest related consults in previous year

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ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-63 (78)	Productive cough with streaks of blood	Examined; CXR arranged	(1) chest clear, no dullness, no glands	CXR	None reported	2WW referral chest clinic (initial consult / 6 days)	On CXR (1° care)	Asthma; diabetes; hypertension	Poor attendance in previous year (DNA to recalls); 6 presentations, inc. 2 asthma reviews
L-64 (78)	Chest infection	Prescribed antibiotics; smoking cessation advice	(2) musculoskeletal chest pain L side, wheeze; frank haematuria	Spirometry	Incidental finding on urology CT scan; urgently referred on to respiratory	2WW referral urology (3 consults / 14 weeks)	On CT scan (<i>incidental opacity R lobe</i>)	Previous branch retinal artery occlusion; smoker;	4 non-chest related consults in previous year; next presented 12 weeks after initial consult
L-65 (70)	2 month h/o hoarse voice	Referred ENT	None reported	None reported	CT at ENT clinic showed <i>mass</i> (25 days after referral), referred on to chest physician	Fast track referral ENT (initial consult)	On CT scan (<i>mass upper L lobe, probably bronchial cancer</i>)	IHD; hypertension; hypothyroidism; anaemia; hiatus hernia	16 consults in previous year, inc. 1 for dry cough which settled (9 weeks before initial consult)
L-66 (70)	Painful left arm	Query musculoskeletal; safety netted re: follow-up	None reported	CXR	Physio suggested orthopaedic referral (12 weeks after initial consult); attended orthopaedic clinic for review, consultant noted weight loss and investigated, lung lesion identified (47 weeks after initial consult)	Referral physio (2 consults / 1 day); referral orthopaedics (8 consults / 13 weeks)	On CT scan (<i>non small cell carcinoma invading brachial plexus</i>)	None reported	Initial CXR normal; site of primary tumour never established; no information on previous presentations
L-67 (69)	Swollen arm, red and sore, shoulder pain	Adverse reaction to pneumococcal vaccine (given day before)	None reported	CXR	None reported	Urgent referral chest clinic (3 consults / 18 weeks)	On CXR (1° care)	Abdominal aortic aneurysm; ex-heavy smoker	Next presented 13 weeks after initial consult; 7 consults in previous year for back pain, unrelated to cancer
L-68 (65)	Noted to be thin at COPD review with nurse	Further review but declined to see GP	None reported	Bloods; CXR	None reported	Urgent referral chest clinic (3 consults / 12 weeks)	On CT scan (<i>inc. brain metastases</i>)	COPD	Patient did not agree to see GP until 12 weeks after initial consult; initial CXR normal
L-69 (65)	3 week h/o SOB, cough 3 months	Examined; CXR arranged	(1) creps R base	CXR	CXR faxed to surgery, <i>suggestive of cancer</i>	Urgent referral (initial consult / 10 days)	On CXR (1° care)	Depression; personality disorder; urinary incontinence; smoker (10 cigs per day)	7 non-chest related consults in previous year

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ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-70 (70)	Medication review, c/o chest and SOB	Urgent CXR arranged	None reported	CXR	CXR suggests <i>referral using 2 week proforma</i>	2WW referral (initial consult / 4 days)	On CXR (1° care)	None reported	No questions raised before initial consult
L-71 (61)	Attended for routine bloods; also indigestion, and pain in upper abdomen on twisting	Advised to stop Nabumatone; prescribed PPI; referred upper GI	(1) clinically pale, no abdominal tenderness; (2) chest clear, no abnormalities in back	Bloods; USS ovary; CXR	Results of blood test phoned to practice same day; result of USS ovary discussed with haematologist, advised <i>treat and repeat in 3 months</i>	Fast track referral upper GI (initial consult); fast track referral chest clinic (3 consults / 6 weeks)	On CXR (1° care)	Post polio syndrome; smoker	Patient denied tiredness, SOB, blood loss at C1, and had weight gain not loss; 5 consults in previous year, inc 1 for chest infection (approx 16 weeks before initial consult)
L-72 (62)	Severe scapular pain radiating to back, R leg, with associated numbness	Arranged x-ray; referred physiotherapy	(1) no neurological findings; (5) no abnormality in chest, palpable mass R supraclavicular fossa, no breast lumps	X-ray back; bloods; bone chemistry; CXR; CEA/CA125 samples; repeat calcium	Repeat calcium result phoned to practice	Referral physiotherapy (initial consult); fast track referral chest clinic (5 consults / 4 weeks); emergency admission by GP for <i>hypercalcaemia</i> (6 consults / 4 weeks)	On CXR (1° care)	Hypertension; smoker	2 non-chest related consults in previous year; declined admission at C4; patient had mets in breast, lung, bones, primary unknown
L-73 (63)	—	—	—	—	Patient with resected bladder tumour, noted to have new pulmonary nodule at surveillance; referred on to respiratory	—	On biopsy (<i>neuroendocrine carcinoma</i>)	Neo-bladder creation post resection; glaucoma	1 non-chest related consult in previous year
L-74 (57)	Cough	Going on holiday; prescribed antibiotics; advised return if still present after holiday (nurse practitioner)	(1) few creps R upper lobe	CXR	None reported	2WW referral chest clinic (2 consults / 8 weeks)	On CXR (1° care)	Osteopenia; ex-smoker (20 cigs per day)	Next presented 8 weeks after initial consult; no consults in previous year; patient elected to have no treatment for lung cancer

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ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-75 (78)	2-3 week h/o head cold, cough and aching ribs	Prescribed antibiotics; flu vac postponed	(1) chest clear; (3) chest clear	ECG; CXR	Attended A&E with SOB; admitted and fluid drained from lung (31 days after initial consult); MDT fax to surgery advising <i>lung cancer diagnosis</i>	None reported	In-patient investigation (<i>CT showed lung cancer</i>)	Diabetes; smoker (12 cigs per day; stopped during process)	Attended for regular diabetic review in previous year; refused CXR at C3; carried out after C4
L-76 (79)	Chest infection and requests for 'cough bottle'	Treated as infection (when signs were obvious)	None reported	CXR	Note on referral to ask haematologists to check if lymphoma related mass	2WW referral haematology (no timescale given / approx 10 weeks)	On CXR (1° care)	Lymphoma; COPD; ex-smoker	Presented numerous times with chest infections over 6 week period; may be recurrence of lymphoma
L-77 (59)	L arm and neck pain unresponsive to pain killers; lower back pain	Referred physiotherapy	None reported	CXR; repeat CXR	None reported	Urgent referral (no timescale given / approx 13 weeks)	On CXR (1° care)	Atrial fibrillation; COPD	Presented 12 months before Dx with haemoptysis and cough; CXR normal; referred chest clinic, nothing untoward found; also seen by ENT, given diagnosis of COPD; thereafter only presented for COPD review
L-78 (50)	Shortness of breath	CXR, ECG and labs arranged	None reported	CXR; ECG; bloods	CXR report recommended <i>specialist referral</i>	2WW referral (2 consults / 6 days)	On CXR (1° care)	COPD	Presented with URTI 4 weeks before initial consult; prior to that no presentations for 3 years
L-79 (79)	Few months h/o increased SOB on exertion, not in bed	Examined; CXR and bloods arranged; for review in 2 weeks (if bloods ok with view to reducing atenolol)	(1) no ankle swelling, creps worse on R than L	CXR; bloods; glucose	Attended A&E with 6 week h/o dry cough, decreased air entry L base (5 weeks after initial consult); CXR done; <i>recommended referral to chest clinic</i> ; GP has no paperwork for A&E attendance	2WW referral chest clinic (3 consults / 7 weeks)	On CXR (<i>new evidence of L lower zone shadowing</i>)	Hypertension; anxiety; depression; osteoporosis; R nipple inversion	Initial CXR, bloods normal; atenolol reduced, plan to review if not settled (14 days after initial consult); patient next presented to A&E; 5 non-chest consults in previous year

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ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-80 (73)	—	—	—	—	Emergency admission (unclear if GP arranged admission), 8 week h/o chronic cough; CXR done; referred on to chest clinic	—	On CXR (<i>radiological diagnosis of lung cancer</i>)	Smoker	No presentations in previous year
L-81 (64)	—	—	—	—	Patient attending hospital for anal cancer; probably lung primary found on CT scan; referred on to chest clinic (different hospital)	—	On CT scan (<i>probable primary lung cancer</i>)	Anal cancer; diabetes; smoker	Seen at diabetic clinic in year before diagnosis, no respiratory symptoms mentioned; given smoking advice
L-82 (74)	1 week h/o cough with green phlegm	Noted other family members had respiratory infection in recent weeks; prescribed antibiotics; advised to return if no improvement	(1) upper zone creps, good air entry both sides	None reported	Attended A&E unwell, SOB and yellow phlegm, tired, passed dark urine, lower limb swelling for 2 weeks; CXR confirmed <i>R-sided pleural effusion</i> ; admitted and IV antibiotics (12 days after initial consult)	None reported	In-patient investigation (<i>mass R upper lobe</i>)	Diabetes; smoker (10 cigs per day)	Presented at least twice per year for diabetic monitoring; dietician commented weight down 2kg (25 weeks before initial consult); next presented 12 weeks after initial consult
L-83 (67)	Generalised rash and itch (pruritis)	Night sweats, weight loss documented; bloods arranged	(6) reduced air entry L base, pleuritic, temperature, tachycardia; (7) large effusion clinically	Bloods; pruritis screen (CXR; repeat bloods); USS abdomen	Letter sent to chest clinic to inform of possible changes on CXR discovered with pruritis screen	Emergency admission by GP (8 consults / 32 weeks)	On CXR (1° care)	Diffuse pulmonary fibrosis; smoker (30 cigs per day)	Chest infection 41 weeks before initial consult; attend chest clinic for pulmonary fibrosis; refused bronchoscopy, refused to stop smoking; declined admission at C6 and C7
L-84 (62)	6 week h/o cough	Prescribed antibiotics	None reported	CXR; spirometry; urgent CXR (after initial referral)	None reported	Referral chest clinic (4 consults / 6 weeks; re-referred with haemoptysis and weight loss (9 consults / 63 weeks)	On urgent CXR (1° care)	COPD (diagnosed during process); smoker;	Initial CXR normal; patient had CXR x4 at chest clinic, no sinister features; GP referred back when no improvement; no detail on previous presentations

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L-85 (57)	Attended CHD review (with GP as previously raised MCV), mentioned cough in passing at end	Arranged repeat bloods; requested CHD review in 3 months; advised to return if cough not settled in 1 month	(1) chest normal	CXR; spirometry	CXR report faxed to surgery in two days (<i>suspicious of lung cancer</i>)	2WW referral chest clinic (3 consults / 6 weeks)	On CXR (1° care)	Angina; raised cholesterol; recent ex-smoker	No detail on previous presentations; wife mentioned had breathlessness, cough for a while but did not present
L-86 (60)	Several week h/o worsening bilateral hip pain, vague chest wall pain	Working diagnosis of referred pain from spine; prescribed analgesia	(1) unremarkable	X-ray pelvis; urgent bloods; repeat calcium; CXR	Path lab phone surgery with blood results (<i>high calcium, very high CRP</i>)	Emergency admission by GP (4 consults / 14 days)	In-patient investigation (CXR <i>hilar mass</i> ; CT <i>showed R lung cancer; bone scan multiple mets</i>)	Arthritis (spine); IHD; smoker	Attended for regular CHD reviews; given repeated smoking cessation advice
L-87 (75)	Persistent hoarseness	Urgent CXR arranged	None reported	Urgent CXR	Attending ENT for R vocal cord palsy, <i>lung lesion</i> found on CT scan; referred on to chest clinic	2WW referral ENT (2 consults / approx 14 days)	On CT scan (<i>L upper lobe</i>); repeat scan after 3 months as lesion <1cm; repeat scan showed <i>increase in size and at r/v</i>	None reported	Initial CXR normal; no detail on previous presentations; due to small size of lesion on discovery, allowed to progress (need for repeat CT)
L-88 (63)	Increasing SOB	CXR arranged	None reported	CXR	None reported	2WW referral chest clinic (no timescale given / approx 9 weeks)	On CXR (1° care)	COPD; asbestos exposure	No detail on previous presentations
L-89 (66)	—	—	—	—	Patient diagnosed abroad	Referral chest clinic (on return to UK)	—	Angina; impotence	Last presented 69 weeks before diagnosis; then moved abroad to live
L-90 (73)	—	—	—	—	Attended A&E with h/o haemoptysis with chest pain; admitted; referred on to chest clinic	—	In-patient investigation (<i>lung tumour R bronchus</i>)	Angina; osteoarthritis; asthma	6 year h/o sore throat; 10 consults in previous year, inc. 1 for chest infection, 1 for cough and wheezy, and 1 for lump in throat, weight loss (31 weeks before A&E attendance)
L-91 (56)	Few days h/o R axilla node	Urgent CXR and bloods arranged	None reported	CXR; bloods	Initial 2WW referral to surgeon for lymph node biopsy was rejected after 1 week	Subsequent 2WW referral haematology (initial consult / 11 days)	On biopsy (<i>metastatic non small cell cancer; CT scan confirmed 2.5cm mass R apex</i>)	None reported	Initial CXR normal; 4 non-chest consults in previous year; rapid LN biopsy service available at hospital

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L-92 (66)	2 week h/o cough, exacerbation of COPD	Prescribed antibiotics	None reported	Urgent CXR	None reported	2WW referral chest clinic (5 consults / 20 weeks)	On CXR (1° care)	COPD	Next presented 10 weeks after initial consult; 5 consults for exacerbation of COPD in previous year
L-93 (67)	None reported	CXR arranged	None reported	CXR	None reported	2WW referral chest clinic (initial consult / 7 days)	On CXR (1° care)	No detail provided (although attended for chronic disease monitoring)	5 non-chest related consults in previous year
L-94 (63)	Exacerbation of COPD	None reported	(3) notable dullness R base	None reported	Attended UCT with SOB, productive cough; prescribed antibiotics, steroids (approx 10 weeks before initial consult); admitted with pneumonia (8 weeks before initial consult (unclear by whom))	Admitted (4 consults / 26 days) died day after discharge, GP has not received discharge letter	On CT scan (<i>consolidation R lung, upper R mediastinal lymphadenopathy, nodular deposits R pleura, liver mets</i>)	COPD; post herpetic neuralgia; smoker	Patient refused hospital admission at C3; c/o vague R-side chest ache, at chest clinic (2 days after initial consult), suggested review at 3 months; diagnosed just prior to death
L-95 (48)	3 month h/o weight loss, lethargy, nausea and epigastric pain	Examined; bloods arranged; for review in 1 week	(1) little to find on examination	Bloods	Attended A&E with new onset SOB; admitted under respiratory team for investigation (23 days after initial consult)	2WW referral upper GI team (2 consults / 7 days)	On CXR (<i>L hilar mass and pleural effusion</i>)	Giardiasis (diagnosed on biopsy at GI clinic)	Infrequent attender; no consults in previous 18 months
L-96 (82)	Cough and phlegm	Prescribed antibiotics	(4) reduced air entry R side	CXR; bloods	None reported	Emergency admission by GP (4 consults / 25 weeks)	On CXR (<i>mass in R upper lobe</i>)	Diabetes (recently diagnosed)	Initial CXR normal (no different to that 3 years earlier); next presented 19 weeks after initial negative CXR; no detail on previous presentations
L-97 (78)	Cough and green phlegm	Prescribed antibiotics	None reported	Sputum culture; repeat sputum culture; CXR; repeat CXR	Initial CXR advised <i>follow up post treatment</i>	Referral chest clinic (5 consults / 19 weeks; later changed to urgent)	On CXR (1° care)	Coronary artery disease (previous CABG); possible heart failure	Initial CXR consistent with inflammatory changes; no detail on previous presentations

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L-98 (56)	2 week h/o coughing blood with phlegm, some weight loss	Examined; referred chest clinic	(1) no clubbing, no SOB at rest, no focal signs in chests	None reported	Admitted with abdominal pain, diagnosed pancreatitis (approx 6 weeks before initial consult)	2WW referral chest clinic (initial consult)	On CT scan (<i>possibility of bronchial carcinoma</i>)	Pancreatitis (recently diagnosed); smoker	Had CXR in hospital (6 weeks before initial consult), but no report available; no detail on previous presentations
L-99 (75)	Persistent laryngeal discomfort, variable hoarseness	Referred ENT	None reported	None reported	Attended ENT clinic, laryngoscopy normal (approx 9 weeks after initial consult); re-attended ENT clinic, no abnormality found (approx 48 weeks after initial consult)	Referral chest clinic (no timescale given / approx 48 weeks)	At chest clinic (<i>unclear how</i>)	None reported	Patient appears to have next presented approx 46 weeks after initial consult, referred back to ENT with hoarseness and haemoptysis; no detail on previous presentations
L-100 (59)	4 week h/o stress, had gastroenteritis on holiday	Advised fluids and bio yoghurt	None reported	None reported	Attended A&E with diarrhoea and constipation, weight loss, general weakness, loss of appetite; CXR showed <i>lung lesion</i> ; admitted (9 weeks after initial consult)	None reported	In-patient investigation (<i>on CXR R mid zone lung lesion</i>)	Hypertension; non-smoker	4 non-chest related consults in the previous year; next presented 8 weeks after initial consult for R back pain
L-101 (49)	1 year h/o dry cough, no sputum but streaks of blood after a prolonged bout	Examined; CXR arranged	(1) chest clear, no SOB, chest pain, weight loss	CXR	None reported	2WW referral chest clinic (initial consult / 12 days)	On CXR (1° care)	Ex-smoker	1 non-chest related consult in previous year
L-102 (67)	2 day h/o left lateral chest pain	Thought chest wall injury (rib #); CXR arranged	None reported	CXR	Practice contacted with result of CXR	Referral chest clinic (initial consult / 18 days)	On CXR (1° care)	None reported	No relevant consultations in previous year
L-103 (67)	Relatives noticed lips more blue	CXR arranged	None reported	CXR	CXR result faxed to surgery, <i>advised fast track CT of chest</i>	Choose and book cardiology (initial consult / 4 days); ? fast track CT chest (initial consult / 25 days)	On CXR (1° care)	None reported	No detail on previous presentations; attended for CXR 18 days after initial consult; cancer not found on CT scan or bronchoscopy

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L-104 (76)	1 week h/o cough	Reassured; review as required	(1) chest clear; (2) decreased air entry R base; (3) R basal creps; (5) R basal creps; (6) R basal creps	CXR; repeat CXR	Attended A&E with UTI (12 weeks after initial consult), CXR taken but no report available, admitted; repeat CXR advised <i>referral for CT scan</i>	Routine referral chest clinic (6 consults / 23 weeks)	On repeat CXR (1° care)	None reported	No detail on previous presentations; no initial CXR report received; diagnosed on bronchoscopy 19 weeks after referral (initial CT reported <i>likely infective changes</i>)
L-105 (45)	—	—	—	—	Attended A&E with chest pain, SOB, sweats, admitted; CXR showed <i>lung lesion</i>	—	In-patient investigation (<i>on CXR shadowing L lung with lesion L lower zone</i>)	Asthma; COPD; IHD; smoker (40 cigs per day; stopped during process)	2 consults in previous year for annual asthma and IHD reviews; CXR was first for 7 years
L-106 (62)	Swollen tips of fingers, no resp. symptoms	Query cause of clubbing; urgent CXR arranged to exclude bronchial neoplasm	None reported	CXR	None reported	2WW rule chest clinic (initial consult / 8 days)	On CXR (1° care)	Heavy smoker	3 non-chest related consults in previous year
L-107 (54)	Chest pain	Previous haemoptysis noted (patient said weeks ago, when had crusted lesion in nose); CXR arranged	None reported	CXR	CXR arranged via A&E consultant (33 weeks after initial consult); copy received at practice but no record of A&E visit	2WW referral chest clinic (6 consults / 35 weeks)	On routine CXR (<i>probably part of medical report by solicitors</i>)	Asthma; smoker	Patient DNA initial CXR; seen 5 times following initial consult for unrelated issues; chest back to normal; practice received A&E report 13 days after taken
L-108 (82)	1 year h/o hoarse voice, present most days but intermittent	CXR arranged	(1) NAD	CXR	Non reported	2WW referral chest clinic (initial consult / 2 days)	On CXR (1° care)	Grief; ex-smoker;	16 presentations in previous year (inc. URTI x3, records suggest symptoms resolved between episodes); at routine medicines review, stated no problems
L-109 (69)	3 week h/o productive cough with weight loss	CXR arranged	None reported	CXR	Initial CXR showed (<i>spiculated mass projected over R lower zone</i>), advised <i>referral breast surgeon</i>	Referral breast clinic (initial consult / 3 days); referral chest clinic (no timescale given / 11 weeks)	On CXR (1° care)	Never smoker	No detail on previous presentations; referred chest clinic after normal breast investigations
L-110 (59)	3 week h/o coughing	Prescribed antibiotics	(1) clinical examination normal	CXR	None reported	Urgent referral chest clinic (3 consults / 9 weeks)	On CXR (1° care)	Non-smoker	1 non-chest related presentation prior to initial consult

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-111 (74)	—	—	—	—	Incidental finding on routine CXR as part of investigation for dementia; previous CXR (2 years earlier) was abnormal but reported as normal	—	On CXR (<i>under old age psychiatry</i>)	Dementia	Presented 3 times in previous year, all dementia related (3 day h/o cough mentioned in last consult (4 days before x-ray))
L-112 (67)	1 week h/o chesty cough and losing weight	CXR and bloods arranged	None reported	CXR; bloods	CXR report faxed to surgery next day advising <i>2WW to chest physician</i>	2WW referral chest clinic (initial consult / 5 days)	On CXR (1° care)	COPD	5 consults in previous year, inc. COPD review
L-113 (83)	Weight loss and haemoptysis	Prescribed antibiotics; CXR arranged (clinical suspicion malignancy)	None reported	CXR	CXR report faxed to surgery advising <i>urgent thoracic / oncology referral</i>	2WW referral chest clinic (initial consult / 3 days)	On CXR (1° care)	COPD (diagnosed at same time as cancer); cataract; indigestion; ex-smoker	Few presentations in previous year, all non-chest related
L-114 (42)	Pharyngitis	Prescribed antibiotics	(2) chest clear; (3) chest clear, no pleural rub	Sputum culture; urgent CXR	Attended A&E with painful toe (1 day after initial consult); CXR report received 2 weeks after taken, copy also sent to chest physician and radiology consultant	2WW referral chest clinic (5 consults / 7 weeks)	On CXR (1° care); patient referred before report received	Smoker	No detail on previous presentations; thought reluctant to present with medical problems; had already been referred when CXR report received
L-115 (93)	Several week h/o dry cough	Prescribed antibiotics	None reported	CXR	None reported	2WW referral chest clinic (2/3 consults / 13 weeks)	On CXR (1° care)	Previous gastric ulcer; kyphosis with osteoporosis; never smoker	No detail on previous presentations; appears next presented approx 12 weeks after initial consult
L-116 (76)	Breathing worse, cough, wheeze, leg weakness	Given increased steroids	None reported	None reported	Specialist Respiratory Nurse recommended <i>additional steroids and antibiotics</i> ; later advised <i>oxygen and nebuliser</i>	Referral general physician (no timescale given / approx 17 weeks)	On CT scan (<i>mediastinal mass obstructing supra vena cava</i>)	COPD; heavy smoker	No detail on previous presentations; patient did not want further intervention or investigation following diagnosis
L-117 (84)	1-2 week history of pleuritic chest pain	Treated as chest infection	None reported	None reported	Emergency admission for acute DVT and general poor mobility; cancer was coincidental diagnosis	Emergency admission by GP (2 consults / 6 days)	In-patient investigation (on imaging, <i>metastatic lung cancer</i>)	None reported	No detail on previous presentations; no red flag symptoms (no previous SOB, haemoptysis etc.)

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-118 (59)	2 month h/o persistent cough with yellow phlegm	Prescribed antibiotics; routine bloods for hypertension check	(1) chest clear; (2) chest creps both bases	CXR; repeat CXR	Initial CXR reported <i>extensive consolidation, small effusion on R most likely secondary to infection</i> , advised <i>repeat in 4 weeks</i>	Referral to chest clinic (no timescale given / approx 22 weeks)	On repeat CXR (1° care)	Hypertension; smoker	No detail on previous presentations; appear to have next presented approx 13 weeks after initial consult
L-119 (82)	Chesty cough with purulent sputum	Examined	(1) rhonchi only; (2) no localised findings	Spirometry; CXR	None reported	Urgent referral chest clinic (4 consults / 10 weeks)	On CXR (1° care)	Temporal arteritis; smoker	Next presented 27 days after initial consult; previous presentations for chronic disease monitoring only
L-120 (49)	Review following OOH presentation	Informed of CXR findings; referred chest clinic	None reported	CXR	Seen by OOH with haemoptysis and SOB, CXR arranged and advised to see GP for review (2 days before initial consult); CXR advised <i>urgent chest physician review</i>	2WW referral chest clinic (initial consult)	On CXR (1° care)	Heart disease; recent ex-smoker	No chest-related consults in previous year
L-121 (64)	—	—	—	—	Presented to cardiologists via acute admissions for chest pain (unclear if GP arranged admission) diagnosis of indigestion, routine CXR	—	In-patient investigation (<i>opacity in R lung</i>)	Depression; claudication; fibroadenoma of breast; smoker	No presentations in previous year
L-122 (63)	Shoulder pain after press ups	Considered to be soft tissue injury	(2) NAD shoulder joint; (3) NAD on examination; (4) creps L base	Bloods; Urgent CXR	None reported	Referral (4 consults / 5 weeks)	On CXR (1° care)	Angina; urinary symptoms; ?smoker	3 non-chest related consults in previous year
L-123 (65)	3 day history of diarrhoea	Bloods and stool sample arranged	None reported	Bloods; stool culture; USS abdomen, pelvis; CXR; repeat CXR	Initial CXR report showed <i>streaky shadowing, couple small nodules suspected to be secondary to old TB</i> , advised <i>repeat 6/52</i> ; endocrinology advice taken, recommended <i>GI investigation</i>	2WW referral chest clinic (timescale not given / approx 18 weeks)	On CXR (1° care)	?Hypertension; IHD	Initial CXR inconclusive, no previous film for comparison; 2-3 non-chest related consults in previous year

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-124 (88)	Generally unwell, pain in L lateral thoracic area	Bloods and MSU arranged; prescribed antibiotics	None reported	Bloods; MSU; USS abdomen; CXR; endoscopy; repeat bloods	None reported	2WW endoscopy (4 consults / approx 4 weeks); 2WW chest clinic (6 consults / approx 8 weeks)	In-patient admission (<i>via chest clinic; metastatic lung cancer</i>)	IHD; asthma / COPD; cerebellar infarction; pacemaker for heart block; CKD stage 3	Initial CXR reported <i>shadow maybe secondary to infection, no underlying mass</i> ; 5 consults with exacerbated COPD in previous year
L-125 (53)	Wheezing	None reported	(6) tender R anterior ribs	CXR	None reported	2WW chest clinic (6 consults / 40 weeks)	On CXR (1° care)	Depression; smoker (40 pack year)	Next presented 9 weeks after initial consult; patient had fear of hospitals, invasive procedures, DNA initial hospital appointments; no detail on previous presentations
L-126 (51)	Pleuritic chest pain, fever	Prescribed antibiotics; given smoking cessation advice	(1) creps on examination; (3) L basal creps; (4) L rhonchi; (6) L lower lobe pleurisy and plural rub; (8) L basal crackles; (9) crackles L base; (10); reduced air entry L side	Sputum culture; CXR; repeat CXR x 2; urgent CXR	Initial CXR report suggested <i>treat as inflammatory, repeat in few weeks</i> ; urgent CXR ? <i>breast tissue rather than lung, if clinically pneumonia treat with antibiotics, repeat PA and lateral films</i> ; seen by OOH for chest pain (51 weeks after initial consult); second repeat CXR <i>warrants investigation by chest physician, cannot exclude neoplasia</i>	Referral chest clinic (12 consults / 54 weeks); initial referral went missing, repeat letter sent after 62 weeks	On CXR (1° care)	Smoker	No detail on previous presentations; first repeat CXR was consistent with pneumonia; initial chest physician referral entry in notes, but no letter or evidence of this
L-127 (63)	—	—	—	—	Emergency admission following sudden onset chest pain (unclear if arranged by GP); CXR showed <i>opacification</i> , referred on to respiratory physician	—	In-patient investigation (<i>opacification in L upper zone</i>)	Ex-smoker (15 pack year)	3 consults in previous year, inc. 1 for chest infection, 1 for chesty cough (46 weeks before initial consult)

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigation ¹	Other Provider Input ²	Referral ³	Indication of Malignancy	Co-morbidity	Other Factors
L-128 (67)	Review following OOH visit, worsening SOB	Prescribed steroids; CXR arranged	None reported	CXR	Seen by OOH, prescribed antibiotics (2 days before initial consult); GP discussed worsening SOB with respiratory physician (after referral, before appointment), patient then admitted	Urgent referral chest clinic (3 consults / 10 days); emergency admission by GP (4 consults / 20 days)	On CXR (1° care)	Fibrosing alveolitis; depression; stroke asbestos exposure; smoker (30-40 cigs per day)	14 consults in previous year, inc. 2 chest infections thought to be caused by fibrosing alveolitis
L-129 (82)	Chest infection	CXR arranged	None reported	CXR; repeat CXR x 4	None reported	2WW referral chest clinic (no timescale given / approx 24 weeks)	On CXR (1° care)	Vascular dementia; COPD; previous gastric ulcer; heavy smoker	Final CXR showed <i>opacity R lower zone</i> , not present in initial CXR; little detail on previous presentations
L-130 (71)	10 day h/o dry cough and pleuritic pain	Prescribed antibiotics and analgesia; advised return as required	None reported	CXR	<i>Abnormal CXR</i> report faxed to practice same day	2WW referral chest clinic (2 consults / 26 days)	On CXR (1° care)	None reported	No presentations in previous 11 months; unsuccessful attempt to contact patient by phone before referral, due to incorrect details
L-131 (61)	3 month h/o dry cough	GP agreed to stop Tamsulosin, as patient thought possible cause	(2) examination unremarkable	Bloods; CXR	<i>Abnormal CXR</i> report faxed to practice	2WW referral chest clinic (3 consults / 14 days)	On CXR (1° care)	Benign prostatic hyperplasia; never smoker	3 non-chest related consults in previous year
L-132 (89)	Few day h/o haemoptysis	CXR arranged	(5) NAD and mobile; backache after fall; (6) tender rectus muscles and abdomen normal (upper abdo pain)	CXR	Attended vascular clinic, anaesthetist asked for further investigation of haemoptysis (17 weeks after initial consult)	Routine referral chest clinic (6 consults / 17 weeks)	On CXR (<i>mass in R helium</i>)	Abdominal aortic aneurism; deafness; never smoker	Initial CXR normal; 1 chest-related consult in previous year

¹ The consultation at which examination took place is given in parenthesis

² Input by Out-of-Hours, Urgent Care Team, Accident & Emergency, and investigative or secondary care services prior to referral

³ Number of consultations before referral / admission, and time since initial presentation are given in parenthesis

Appendix C:

TYA cancers – Interpretative matrix for process of referral

TYA CANCERS – INTERPRETATIVE MATRIX FOR PROCESS OF REFERRAL

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigations	Other Provider Input	Referral ¹	Indication of Malignancy	Diagnostic Group	Other Factors
TYA-01 (15-19)	Few days h/o sore throat and fatigue; heavier than usual period	Examined; FBC and IM test arranged	(1) one enlarged cervical lymph node (1cm), otherwise unremarkable	Bloods; IM test	Result phoned to OOH GP same day; patient advised to attend A&E; A&E staff contacted haematologist; subsequently admitted same day	—	Blood test (1° care)	Haematological	No detail on previous presentations; tracked down by OOH later that day
TYA-02 (15-19)	Swelling of R calf, no pain or trauma	Examined; bloods arranged	(1) 1" greater than L calf, mild oedema, no abnormality groins, abdomen or elsewhere	Bloods	Called OOH as developed sudden pain in calf, increased swelling (2" greater than L); admitted, ruptured popliteal cyst diagnosed (15 days after initial consult); GP discussed diagnosis with orthopaedic on call team, pain worse, swelling still present, ortho appointment made (27 days after initial consult)	Orthopaedic appointment made by phone (4 consults / 28 days)	In-patient investigation (USS)	Sarcomas / bone *	Frequent consults in previous year with migraine; admitted from orthopaedic clinic
TYA-03 (15-19)	1 day h/o swelling over L clavicle area	Saw nurse practitioner; GP called in, considered brachial cyst; referred ENT clinic	(1) 8cm x 8cm non tender cystic swelling over L clavicle, no other neck nodes palpable	None reported	None reported	Routine referral ENT (initial consult)	Unclear	Haematological	No detail on previous presentations; diagnosed 6 weeks after referral
TYA-04 (20-25)	Mole darker with irregular outline, changed over months	Referred primary care skin team	(1) examination of site	None reported	None reported	Urgent referral primary care skin team (initial consult); 2WW referral plastic surgeons (no timescale given / 12 weeks)	Histology	Melanoma	No detail on previous presentations; seen in dermatology 8 weeks after initial consult, lesion excised that day

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigations	Other Provider Input	Referral ¹	Indication of Malignancy	Diagnostic Group	Other Factors
TYA-05 (20-25)	4 week h/o 3 enlarged lymph nodes in neck	Bloods arranged	None reported	Bloods; glandular fever serology	None reported	Referral general medicine (initial consult / 14 days)	On CXR	Haematological	1 non-related consult in previous year
TYA-06 (20-25)	Generally unwell, light headedness, weight loss, head and throat throbbing	ECG and bloods arranged	(1) Normal, except slightly tachycardic	ECG; bloods	None reported	Emergency admission by GP, recent onset cough, pleuritic chest pain (2 consults / 5 days)	In-patient investigation (on CXR)	Haematological	No detail on previous presentations
TYA-07 (15-19)	Fracture of humerus approx. 6 weeks before, pain not settling, wanted second opinion	Letter for second opinion sent	None reported	None reported	Hospital phoned surgery (1 day after initial consult), review of x-ray of fracture showed lesion not noted previously	Orthopaedic appointment made by phone (same day as call / 1 consult / 1 day)	On x-ray	Sarcomas / bone	No detail on previous presentations
TYA-08 (20-25)	Query lump left scrotum	Examined	(1) with help of patient, was felt that patient was feeling epididymis which was normal; (2) 2cm swelling, could not be separated from testicle	None reported	None reported	Urgent referral urology (2 consults / 21 weeks)	Unclear	Testicular	No detail on previous presentations; had not received clinic appointment 9 days after referral (prob. with hospital computer system); GP phoned consultant urologist who agreed to see next day
TYA-09 (15-19)	—	—	—	—	Attended community ophthalmologist reported 2 week h/o visual field loss, no other symptoms	Urgent referral (3 days); emergency admission by GP (1 consult / 35 days)	Ophthalmology report	Brain / nervous system	No detail on previous presentations; next presented 35 days after referral, not yet seen at hospital; had developed headache, more visual disturbance

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigations	Other Provider Input	Referral ¹	Indication of Malignancy	Diagnostic Group	Other Factors
TYA-10 (20-25)	Cough	Prescribed antibiotics	(5) possible palpable liver, cervical node L side	CXR; bloods; acid fast bacilli; USS abdomen	Attended A&E with chest pain, muscle sprain diagnosed (19 days after initial consult); CXR showed <i>parahilar shadowing, small L pleural effusion</i> , recommended <i>antibiotics and refer if not improved</i>	2WW referral chest clinic (5 consults / 7 weeks)	On CXR, bloods (1° care)	Haematological	No detail on previous presentations; also had poorly controlled diabetes
TYA-11 (15-19)	Several weeks h/o testicular pain	Urgent USS arranged	(1) large, tense scrotal swelling, did not transilluminate	USS testes	USS result reported to practice same day, advised <i>urgent urological opinion</i>	2WW referral urology (2 consults / 1 day)	On USS	Testicular	Not previously seen for over 1 year; admitted from chest clinic
TYA-12 (20-25)	1 week h/o swollen painful neck, starting to subside (sudden onset on exercising)	Examined; no specific treatment given	(1) clinically swelling whole of L sternomastoid muscle, no lymph nodes swelling; (2) distinct lump L sternomastoid area	Bloods	None reported	Urgent referral ENT (2 consults / 9 weeks)	Fine needle aspiration	Haematological	No relevant consults in previous year
TYA-13 (20-25)	Shoulder pain (? post rock climbing)	Prescribed analgesia	(1) shoulder tender on examination; (3) abdo soft, slightly bloated, no masses, no liver, kidney, spleen on examination (4) abdo distended and percussion dull, empty rectum; (6) abdo distended ++	None reported	None reported	Emergency admission by GP (4 consults / 13 days); re-admitted as emergency (6 consults / 27 days)	In-patient investigation (<i>on CT scan</i>)	Melanoma (likely)	No detail on previous presentations; practice did not receive discharge letter from initial admission
TYA-14 (15-19)	12 month h/o R knee pain, worse at night, morning stiffness	X-ray arranged; referred physiotherapy	None reported	X-ray (knee); bloods; x-ray (sacroiliac joint)	Duty orthopaedic team contacted by GP and admission arranged (9 weeks after initial consult)	Referred physiotherapy (initial consult); emergency admission by GP (4 consults / 9 weeks)	On second x-ray	Sarcomas / bone	Several non-related consults in previous months; initial knee x-ray normal
TYA-15 (15-19)	6 week h/o lump in upper L thigh, no trauma, no pain	USS arranged	(1) 6cm x 6cm lump on medial aspect L thigh	USS	None reported	2WW referral orthopaedic (2 consults / 18 days)	Unclear	Sarcomas / bone	1 non-related consult in previous year

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigations	Other Provider Input	Referral ¹	Indication of Malignancy	Diagnostic Group	Other Factors
TYA-16 (20-25)	Flushing, some swelling in neck	CXR arranged	(1) reduced air entry R side	CXR	None reported	2WW referral chest clinic (initial consult)	On CXR (1° care)	Haematological	No relevant consults in previous year; non-smoker
TYA-17 (20-25)	Red eye, and small swelling R posterior triangle of neck	Probably shotty neck lymph nodes secondary to nodular acne; referred dermatology clinic (to consider roaccutane); prescribed antibiotics; advised return if lymph nodes persist	(1) several small, slightly tender swellings above site; acne nodular over R upper back; (5) hard, pea sized lymph node R side neck	Bloods	None reported	2WW referral ENT (5 consults / 110 weeks)	ENT clinic (<i>urgent surgery</i>)	Other (rare endocrine)	No detail on previous presentations; next presented 47 weeks after initial consult; lymph node not mentioned for a further 63 weeks
TYA-18 (15-19)	Pain in groin, though to be from football injury	Physiotherapy arranged	None reported	None reported	Seen by OOH and A&E, sudden onset pain L groin, admitted, diagnosed musculoskeletal pain (approx 22 after initial consult)	Referral orthopaedics (no timescale given / approx 26 weeks)	On MRI scan	Sarcomas / bone *	No detail on previous presentations; next presented approx 26 weeks after initial consult)
TYA-19 (20-25)	Back pain and weight loss	Patient reluctant to be examined; bloods arranged; advised to return to see male GP to be examined	(2) large abdominal mass (size of melon)	Bloods; repeat bloods	None reported	2WW referral gastroenterology (2 consults / 15 days)	USS abdomen	Brain / nervous system	Also had learning difficulties; no presentations in previous year
TYA-20 (20-25)	Several weeks h/o epigastric tenderness (on / off)	Prescribed H2 receptor antagonist and dopamine antagonist; planned review 2 weeks	(2) no strawberry tongue, nothing abnormal detected throat, oral pallor; (3) pulse normal	None reported	None reported	Emergency admission by GP (3 consults / 17 days)	In-patient investigation (<i>on biopsy</i>)	Haematological *	No detail on previous presentations
TYA-21 (20-25)	Cervical lymphadenopathy and tonsillitis	Bloods arranged; advised to have repeated in 1 month	(2) bruises, noted to be firm, raised on trunk and face, associated with firm, enlarged lymph nodes groin, axilla and neck	Bloods; repeat bloods x 3	GP discussed symptoms with haematology consultant (58 weeks after initial consult)	Urgent referral haematology (2 consults / 58 weeks)	Infectious diseases clinic	Other (rare skin)	No relevant consults in previous year; asked to see GP for medical review after 2 nd repeat blood test, but did not make appointment; next presented 58 weeks after initial consult

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigations	Other Provider Input	Referral ¹	Indication of Malignancy	Diagnostic Group	Other Factors
TYA-22 (15-19)	Swelling of suprasternal region	Admitted to hospital	None reported	None reported	None reported	Emergency admission by GP (initial consult); re-referred hospital, wound site discharging (2 consults / 6 weeks)	On CT scan	Haematological *	No detail on previous presentations; initial hospital discharge after incision and drainage of lesion in neck
TYA-23 (15-19)	Swelling L check	Advised to check with a dentist	(2) fundus L eye OK	X-ray; bloods	None reported	Patient sent to ENT casualty (3 consults / 14 days)	In-patient investigation (<i>on biopsy</i>)	Sarcomas / bone *	2 non-related consults in previous year; admitted from ENT casualty dept
TYA-24 (15-19)	2 year h/o weight loss, also polyuria and thirst	Diabetes suspected; bloods arranged	None reported	Bloods	Haematologist phoned practice to report <i>abnormal blood film</i> (4 days after initial consult)	Referral haematology (initial consult / 4 days)	Unclear	Haematological *	2 non-related consults in previous year; also has diabetes
TYA-25 (20-25)	1 week h/o pain in L axilla, sweats, 2 day h/o lump	Examined; bloods arranged; planned review 2 weeks	(1) ¾" nodule subcutaneous, no other lymph nodes, no spleen found; (2) L axillary lump almost cleared, difficult to feel, smaller than pea; (3) 3cm slightly tender lymph node	Bloods; repeat bloods	Discussed symptoms with haematology registrar (raised LDH), advised <i>2WW haematology and surgery for biopsy</i> (7 weeks after initial consult)	2WW referral haematology (3 consults / 7 weeks)	Unclear	Haematological	No relevant consults in previous year
TYA-26 (20-25)	None reported	Admitted to hospital	(1) stridor present	None reported	None reported	Emergency admission by GP (initial consult)	In-patient investigation (<i>on CT scan</i>)	Haematological	No relevant consults in previous year
TYA-27 (20-25)	Chest pain	None reported	None reported	None reported	Attended A&E, and was admitted (55 weeks after initial consult)	None reported	Histology	Sarcomas / bone	No relevant consults in previous year; presented 12 days after initial consult, then presented twice in subsequent year for non-related issues

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigations	Other Provider Input	Referral ¹	Indication of Malignancy	Diagnostic Group	Other Factors
TYA-28 (15-19)	Shoulder pain, facial flushing on exercise, no cough, sputum or SOB	Prescribed analgesia; advised return if no improvement	(1) nil remarkable other than tender shoulders; (2) heart murmur	Bloods	Lab rang practice same day with <i>suspicious result</i>	Referral cardiology (2 consults / 20 days); urgent haematology referral (2 consults / 28 days)	At haematology clinic (unclear how)	Haematological	No detail on previous presentations; patient attended for blood test 9 days after arranged
TYA-29 (20-25)	Sinus pain	Prescribed antibiotic	None reported	None reported	Attended A&E with epistaxis, admitted and nose packed (9 days after initial consult)	Urgent referral (5 consults / 19 days)	Unclear	Sarcomas / bone	No detail on previous presentations; other reasonable explanation considered cause for original epistaxis
TYA-30 (20-25)	Cough and phlegm	Examined; advised return in 2 weeks if node persisted	(1) L cervical lymph node palpable	CXR; bloods	None reported	2WW referral haematology (2 consults / 32 weeks)	On biopsy	Haematological	No relevant consults in previous year; next presented 32 weeks after initial consult, lumps both sides neck; DNA initial appointment with consultant
TYA-31 (20-25)	—	—	—	—	Patient diagnosed when on holiday abroad	Referral urology and oncology (immediately on return to UK)	On CT scan	Testicular	No presentations in previous year
TYA-32 (15-19)	2 week h/o painless lump R posterior triangle of neck	Bloods arranged, including Epstein-Barr virus test	None reported	Bloods	None reported	2WW referral ENT (3 consult / 13 days)	Fine needle aspiration	Other (rare head & neck)	1 non-related consult in previous year
TYA-33 (20-25)	Changing mole	Referred dermatology clinic	(1) examination of site	None reported	None reported	Routine referral dermatology (initial consult / 1 day)	None reported	Melanoma	No detail on previous presentations; patient saw consultant 10 weeks after referral
TYA-34 (20-25)	Pain R loin, reported as recurrent	Examined; MSU arranged	(1) slightly tender over R abdomen; (8) pelvic mass and fixed uterus	MSU; USS	None reported	Referral gynaecology (8 consults / approx 88 weeks)	Unclear	Other (rare in age, gynaecological) *	No detail on previous presentations; patient mentioned RIF pain at 2 consults in the subsequent 88 weeks

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response	GP Examination	Primary Care Investigations	Other Provider Input	Referral ¹	Indication of Malignancy	Diagnostic Group	Other Factors
TYA-35 (20-25)	2 month h/o pain R knee (possible sprain from football)	Prescribed analgesia	(1) no abnormality detected; (2) no abnormality detected; (3) swelling belly of lower R quadriceps	Routine USS	Telephone conversation between GP and radiologist, <i>need for urgent referral</i> (18 weeks after initial consult); letter from ortho surgeon re-directing referral to specialist (2 days after 2WW referral)	2WW referral orthopaedics (4 consults / 18 weeks)	On USS (<i>abnormal</i>); also had x-ray and MRI while still in dept	Sarcomas / bone	No detail on previous presentations

* Diagnosis was made prior to introduction of the 2WW

¹ The consultation at which examination took place is given in parenthesis

² Input by Out-of-Hours, Urgent Care Team, Accident & Emergency, and investigative or secondary care services prior to referral

³ Number of consultations before referral / admission, and time since initial presentation are given in parenthesis

Appendix D:

Lung cancer – Presentations resulting in referral >1 month after initial consultation (chest symptoms)

LUNG CANCER – PRESENTATIONS RESULTING IN REFERRAL >1 MONTH AFTER INITIAL CONSULTATION (CHEST SYMPTOMS)

ID (Age)	Initial Presentation	GP Response and Referral	Potential Explanatory Factors For Time to Referral	Interpretation of Case
L-01 (74)	“Cough and chesty”, with green sputum	Prescribed antibiotics; advised return if no improvement 2WW referral to respiratory clinic (4 consults / 15 weeks)	2 nd presentation was 11 weeks after initial consult; 3 rd consultation was 7 days later, and 4 th another 7 days after that. CXR organised then as lungs still not clear although had improved	Patient asked to come back after 1 consultation, but did not re-present for 11 weeks – may have improved symptomatically at this time with treatment
L-04 (79)	C/o of SOB at hypertension review with practice nurse	Referred to nurse practitioner for assessment; Emergency admission by GP (4 consults / 36 weeks)	CXR carried out within a few days of initial presentation was normal. Next presented 36 weeks after nurse practitioner consult with SOB, given antibiotics for LRTI but returned much worse 5 days later and was admitted	Initial CXR normal
L-07 (62)	1 week h/o cough	Treated as viral infection; given smoking cessation advice Emergency admission by GP (7 consults / 63 weeks)	2 nd presentation was 22 weeks after initial consult; review offered at C5 if deteriorating, next presented 6 weeks later; DNA spirometry	Cough appears to have been explained by smoking. Possible opportunity for earlier diagnosis if cough had been considered in more detail
L-08 (80)	2 day h/o cough	Prescribed antibiotics Routine referral to chest clinic (5 consults / 39 weeks)	Initial two consultations may have related to a separate episode as there was 5 months between C2 and C3. At C2, patient was improved from initial presentation at C1. Initial CXR (at consultation 3) compatible with infection; ESR=58 at this point; repeat CXR unchanged (patient DNA initial repeat appointment)	First CXR compatible with infection and then patient was a DNA for repeat CXR appointment
L-10 (78)	Cough	Prescribed antibiotics; follow up arranged Emergency admission by GP (4 consults / 12 weeks); emergency admission by GP (5 consults / 22 weeks)	Patient attended secondary care weekly (x3) for dialysis; four unsuccessful attempts to contact by phone. On first emergency admission for breathlessness, CXR showed fluid overload.	Complex presentation in patient with multiple morbidity
L-11 (46)	R axillary chest pain	Sounds musculoskeletal; reassured by GP 2WW to chest clinic (2 consults / 5 weeks)	Seen 3 weeks after initial consultation and although this was mainly to do with cardiovascular risk assessment, a CXR was arranged which suggested malignancy. The report of this came through 7 days later; patient couldn't be contacted for 3 days due to work commitments so was referred 10 days after CXR	Just over a month to referral – response at initial consultation seems appropriate
L-13 (90)	4 day tender swelling on anterior chest wall	Metastatic nodule considered, but tenderness suggested infection; prescribed antibiotics 2WW to dermatology for biopsy (3 consults/6 weeks)	Possibility of metastatic nodule was discussed with patient from first consultation. Active management of a cancer was always considered inappropriate (presumably in view of patient's age). At C2 (1 month after initial consult), referral discussed by deferred at patient's request. Referred following week	Appropriate response, taking into account patient factors and wishes
L-22 (69)	Wheeze and productive cough	Prescribed antibiotics and steroids Routine referral chest clinic (4 consults / 8 weeks)	CXR carried out 2 weeks after initial consultation as symptoms had not improved. This was reported as being essentially normal. Referred as symptoms not improving – referred routinely as CXR normal. Diagnosis eventually made on CT scan ordered by respiratory physician	Initial CXR normal
L-26 (70)	Persistent productive cough with yellow sputum	Prescribed antibiotics 2WW referral chest clinic (2 consults / 5 weeks)	Patient returned just over one month after initial appointment. Had no other consultations in year before. Cough persistent after a month so CXR requested. Patient was a never smoker, but had been a passive smoker	Appropriate initial response; re-presentation with non-resolving symptoms acted on promptly

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response and Referral	Potential Explanatory Factors For Time to Referral	Interpretation of Case
L-29 (74)	Cough and haemoptysis	CXR arranged 2WW referral chest clinic (2 consults / approx 14 weeks)	Initial CXR was normal; no other presentations in previous year; next presented 3 months after initial consult with cough, but now also c/o weight loss – CXR on this occasion showed a mass	Initial CXR normal
L-33 (82)	Exacerbation of COPD, worsening breathlessness	Examined Referral chest clinic (3 consults / approx 11 weeks)	Consulted approx. monthly with range of symptoms; reluctant to be referred to hospital. Admitted as emergency via A&E, COPD exacerbation, CXR, sputum cytology done (negative), referred chest clinic (6 days after initial consult); discharge letter stated <i>CXR changes L mid zone, ?small shadow signs of infection, repeat in 6 weeks to assess R sided lesion</i>	Patient factors complicated this scenario, including reluctance to be referred initially and then DNA chest clinic
L-35 (74)	Pre-assessment review with Healthcare Assistant, noted patient was coughing a lot	Diagnosed ACEi induced cough. Referral chest clinic (11 consults / 35 weeks)	Complex story of cough initially being thought to be caused by ACEi, changed to ARB to which had a reaction. Also had numerous consultations with other symptoms (including numbness in arm, dizziness, shingles type pain, leg cramps Previous CT scan from General Medicine showed <i>incidental findings</i> (40 weeks before abnormal CXR) Diagnosis made on CXR carried out at from General Medicine OP appointment showed <i>dense L helium, could be vascular or tumour, advised referral to chest physician</i> (35 weeks after initial consult)	Diagnosis of cough as ACEi induced cough may have increased time to diagnosis – although a recent CT of chest had showed ‘incidental findings’ would have been understandably reassuring
L-39 (69)	Coughing up blood, weight loss	Urgent CXR arranged. Emergency admission by GP (2 consults / 5 weeks)	CXR done one month after initial consultation (not clear if this was patient choice or system issue, although patient noted to be a poor attendee at clinics unless ill). Patient had known COPD and had attended 3 months earlier with cough and very little phlegm with streaks of blood	Probable patient issues; although may also be missed opportunity for earlier diagnosis
L-49 (57)	Upper respiratory tract infection	Given advice 2WW referral (3 consults / 10 weeks)	Patient had 2 consultations 22 days apart for URTI symptoms. Then re-presented 6 weeks after C2 with SOB at which time a CXR was requested and showed collapse of right middle and lower lobes	Insufficient detail is reported regarding the first 2 consultations to make a judgment as to whether these were likely to be URTI related, or whether an opportunity for earlier diagnosis was missed
L-56 (76)	3 month h/o cough	CXR arranged; referred ENT clinic 2WW referral chest clinic (no timescale given / approx 18 weeks)	Seen twice with respiratory symptoms in year of diagnosis; initial CXR was abnormal but inconclusive, repeated twice over 4 months	Initial CXR inconclusive
L-58 (63)	Recurrence of productive cough	Prescribed antibiotics 2WW referral chest clinic (4 consults / 9 weeks)	CXR arranged at C2 (14 days after initial consultation) despite improvement in symptoms. Initial CXR report advised repeat in 6 weeks	Initial CXR report advised repeat after 6 weeks
L-64 (78)	Chest infection	Prescribed antibiotics; smoking cessation advice. Next presentation was for haematuria and so referred under 2WW to urology.	Incidental finding on urology CT scan; urgently referred on to respiratory	Lung cancer seems to have been incidental finding on CT scan, although had presentation with chest infection symptoms 10 weeks earlier
L-67 (69)	Swollen arm, red and sore, shoulder pain	Adverse reaction to pneumococcal vaccine (given day before) Urgent referral chest clinic (3 consults / 18 weeks)	Next presented 13 weeks after initial consult; 7 consults in previous year for back pain, unrelated to cancer	Complex presentation in patient with multiple morbidity

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response and Referral	Potential Explanatory Factors For Time to Referral	Interpretation of Case
L-68 (65)	Noted to be thin at COPD review with nurse	Reviewed again by nurse; when saw GP had worsening symptoms and referred urgently to chest clinic (3 consults / 12 weeks)	Nurse reviewed patient 6 weeks after COPD review consultation and weight loss noted. Patient declined to see GP until 6 weeks after this second consultation with nurse. Initial CXR normal	Patient declined to see GP until 12 weeks after initial consultation
L-74 (57)	Cough	Going on holiday; prescribed antibiotics; advised to return if still present after holiday (nurse practitioner) 2WW referral chest clinic (2 consults / approx 8 weeks)	Patient going on holiday at time of initial consultation. Advised to return if cough still present after holiday. Next presented 2 months later still coughing, at which point they were sent for CXR.	Patient delayed returning after initial consultation
L-76 (79)	Chest infection and requests for 'cough bottle'	Treated as infection (when signs were obvious) 2WW referral haematology (approx 10 weeks)	Past history of lymphoma – indeed, no clarification as to whether this episode was recurrent lymphoma or new lung cancer.	Diagnosis may have been recurrence of lymphoma, complicating this scenario
L-79 (79)	Few months h/o increased SOB on exertion, not in bed	Examined; CXR and bloods arranged; for review in 2 weeks (if bloods ok with view to reducing atenolol) 2WW referral chest clinic (3 consults / 7 weeks)	Initial CXR and bloods normal; atenolol reduced, plan to review if not settled (14 days after initial consult); patient next presented to A&E; 4 non-chest consults in previous year Attended A&E with 6 week h/o dry cough, decreased air entry L base (5 weeks after initial consult); CXR done; abnormality now seen - recommended referral to chest clinic	Complex presentation in a patient with multiple morbidity. Initial CXR showed no change from previous ones
L-83 (67)	Generalised rash and itch (pruritis)	Night sweats, weight loss documented; bloods arranged Emergency admission by GP (8 consults / 32 weeks)	Bloods; pruritis screen (CXR; repeat bloods); USS abdomen Chest infection 9 months before initial consult; chest clinic for pulmonary fibrosis; refused bronchoscopy, declined admission at C6 and C7	Complex presentation in a patient with multiple morbidity. Initial CXR showed no change from previous ones. Patient factors
L-84 (62)	6 week h/o cough	Prescribed antibiotics Referral chest clinic (4 consults / 39 days); re-referred with haemoptysis and weight loss (9 consults / 63 weeks)	Initial CXR (done at C1) normal; patient had CXR x4 at chest clinic, no sinister features; GP referred back when no improvement.	Initial CXR normal
L-85 (57)	Attended CHD review (with GP as previously raised MCV), mentioned cough in passing at end	Arranged repeat bloods; requested CHD review in 3 months; advised to return if cough not settled in 1 month 2WW referral chest clinic (3 consults / 6 weeks)	Patient returned for C2, 4 weeks after initially seen. CXR requested that day	Reasonable to ask patient to return in 1 month if cough had not settled. (Guidelines suggest 3 weeks). However, if practice had not followed up raised MCV by inviting patient for consultation (compared, for example, to writing with a plan), the patient may not have complained of cough for some time
L-88 (63)	Increasing SOB	CXR arranged 2WW referral chest clinic (no timescale given / approx 9 weeks)	Little information given in document presented but CXR requested when seen 2 months after initial consultation	May have been opportunity for earlier referral if increasing SOB (in patient with known asbestos exposure) had been initiated at time of first complaint

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response and Referral	Potential Explanatory Factors For Time to Referral	Interpretation of Case
L-92 (66)	2 week h/o cough, exacerbation of COPD	Prescribed antibiotics 2WW referral chest clinic (5 consults / 20 weeks)	Although seen several times with exacerbations of COPD in the 5 months prior to diagnosis, was sent for urgent CXR when complained of weight loss. At the first 2 consultations (10 weeks apart) the patient gave a 2 week history of symptoms	Presentations of exacerbations of COPD seemed to be new presentations. May have been opportunity for earlier diagnosis
L-96 (82)	Cough and phlegm	Prescribed antibiotics Emergency admission by GP (4 consults / 25 weeks)	Initial CXR normal (no different to 3 years earlier); next presented 21 weeks after initial negative CXR	Initial CXR normal
L-97 (78)	Cough and green phlegm	Prescribed antibiotics Referral chest clinic (5 consults / 19 weeks; later changed to urgent)	Improved after initial treatment with antibiotics. Presented with new episode 5 weeks later and again responded to antibiotics. Next presentation another month later – again responded to antibiotics. The subsequent presentation was another 5 weeks later again – now becoming short of breath and CXR ordered. Initial CXR advised follow up post treatment	Initial CXR consistent with inflammatory changes which lengthened time to referral, although in view of recurrent episodes of infection CXR could have been requested earlier
L-99 (75)	Persistent laryngeal discomfort, variable hoarseness	Referred ENT Referral chest clinic (no timescale given / approx 48 weeks after initial consult)	Attended ENT clinic, laryngoscopy normal (approx 8-12 weeks after initial consult); re-referred to ENT clinic, no abnormality found (approx 1 year after initial consult). Had previously had lobectomy for lung cancer (1 year earlier) and was also being followed up at chest clinic	Presentation suggested laryngeal cancer
L-104 (76)	1 week h/o cough	Reassured; review as required Routine referral chest clinic (6 consults / 23 weeks)	Sent for routine CXR at C2, 1 month after seen initially. CXR reported as showing consolidation, repeat 4 weeks after antibiotic Rx - although it seems that this report was seen 6 weeks after requested. Within this time attended A&E with UTI (12 weeks after initial consult), CXR taken but no report available, admitted; repeat CXR advised referral for CT scan. Diagnosed on bronchoscopy 4 months after referral (initial CT reported <i>likely infective changes</i>)	Initial CXR report received 6 weeks after requested (routine request) and suggested repeat x-ray after Rx for consolidation
L-107 (54)	Chest pain	Haemoptysis noted; CXR arranged 2WW referral chest clinic (6 consults / 35 weeks)	Patient DNA initial CXR appointment (referred after initially c/o haemoptysis). Subsequent consultations - haemoptysis had settled and was putting weight on. CXR arranged via A&E consultant; copy received at practice but no record of A&E visit	Patient factors
L-109 (69)	3 week h/o productive cough with weight loss	CXR arranged Referral breast clinic (initial consult / 3 days); referral chest clinic (no timescale given / 11 weeks)	Initial CXR showed (spiculated mass projected over R lower zone), advised referral breast surgeon. Referred to chest clinic after breast investigations normal	Initial CXR report acted on appropriately
L-110 (59)	3 week h/o coughing	Prescribed antibiotics Urgent referral chest clinic (3 consults / 9 weeks)	When seen initially given antibiotics for a 3 week h/o cough. Not seen again for 2 months, at which point c/o coughing for 2 months so sent for CXR. Urgent referral done 15 days later. Patient was a non-smoker	Opportunity for earlier diagnosis may have been missed as patient with 3 week h/o cough not sent for CXR. However, patient was non-smoker, perhaps reducing index of suspicion
L-114 (42)	Pharyngitis	Prescribed antibiotics 2WW referral chest clinic (5 consults / 7 weeks)	Urgent CXR was ordered at C4 (1 month after initial consult) at which time haemoptysis had developed. Earlier consultations were all thought to be infective	Referred for CXR one month after initial presentation with infective symptoms
L-115 (93)	Several week h/o dry cough	Prescribed antibiotics 2WW referral chest clinic (2/3 consults / 13 weeks)	Patient (93 year old never smoker) presented with several week h/o of dry cough, was given antibiotics, and at review said it had cleared up. CXR arranged at the next consultation almost 3 months later when patient complained it had persisted	Reasonable initial response in a never smoker

An analysis of significant event audit for cancer diagnosis

ID (Age)	Initial Presentation	GP Response and Referral	Potential Explanatory Factors For Time to Referral	Interpretation of Case
L-116 (76)	Breathing worse, cough, wheeze, leg weakness	Given increased steroids Referral general physician (no timescale given / approx 17 weeks)	Patient with COPD well known to respiratory team. Specialist Respiratory Nurse recommended additional steroids and antibiotics; later advised oxygen and nebuliser. Referred with worsening chest symptoms – had SVCO	Protracted diagnosis in a patient with a known chest condition
L-118 (59)	2 month h/o persistent cough with yellow phlegm	Prescribed antibiotics; routine bloods for hypertension Referral to chest clinic (no timescale given / approx 22 weeks)	Patient re-presented 2 months after initial presentation. CXR was arranged at that point, and reported extensive consolidation, small effusion on R most likely secondary to infection, advised repeat in 4 weeks	Opportunity for earlier CXR – as at initial presentation had a 2 month history of symptoms
L-119 (82)	Chesty cough with purulent sputum	Examined Urgent referral chest clinic (4 consults / 10 weeks)	Next presented 4 weeks after initial consult with similar presentation, and then presented again for the third time 20 days later. At C4, when symptoms persistent, CXR arranged	Opportunity for earlier CXR
L-122 (63)	Shoulder pain after press ups	Considered soft tissue injury (4 consults / 5 weeks)	On fourth consultation with non-resolving shoulder pain, urgent CXR arranged. Patient thought pain was due to injury – but at C3 had also c/o tiredness and weight loss. CXR arranged 1 week later	Complex presentation of shoulder pain in the context of h/o injury
L-124 (88)	Generally unwell, pain in L lateral thoracic area	Bloods and MSU arranged; prescribed antibiotics 2WW endoscopy (4 consults / approx 4 weeks); 2WW chest clinic (6 consults / approx 8 weeks)	Care home resident with complex PMH. CXR arranged at second visit. This CXR showed pleural shadow, maybe secondary to infection, no underlying mass; was c/o anorexia, weight loss and possible dysphagia so referred for endoscopy	Complex presentation in a patient with multiple morbidity
L-125 (53)	Wheezing	Trial of inhaler. 2WW chest clinic (6 consults / 40 weeks)	2nd presentation 9 weeks after initial consult; but then seen 3 more times with chest complaints before CXR ordered. Patient had fear of hospitals, invasive procedures, DNA initial hospital appointments; no definitive diagnosis ever reached of type of lung cancer	Patient factors relevant, but there may also be opportunity for earlier diagnosis
L-126 (51)	Pleuritic chest pain, fever	Prescribed antibiotics; given smoking cessation advice Referral chest clinic (12 consults / 54 weeks); initial referral had gone missing and repeat letter sent after 62 weeks	First CXR ordered 4 weeks after initial presentation (C4). This CXR report suggested treat as inflammatory, repeat in few weeks; CXR wasn't repeated until next presented with chest infection symptoms 7 months later. That CXR showed shadowing consistent with pneumonia (in same area as before). 2 months later further infective symptoms and when they didn't clear up within a week, another urgent CXR ordered. This was reported as ?breast tissue rather than lung, if clinically pneumonia treat with antibiotics, repeat PA and lateral films; seen by OOH for chest pain (51 weeks after initial consult); second repeat CXR <i>warrants investigation by chest physician, cannot exclude neoplasia</i>	First repeat CXR was consistent with pneumonia; but the repeat CXR suggested by radiologist in a few weeks time did not happen. Opportunity missed for earlier diagnosis. However, radiologists reported ongoing opacity as infection – only 11months after first CXR did they recommend further Ix
L-129 (82)	Chest infection	CXR arranged 2WW referral chest clinic (no timescale given / approx 24 weeks)	Had 4 CXRs over 5 month period after presentation with recurrent chest infections. The final CXR showed opacity R lower zone, not present in previous CXR. Complex elderly patient with multiple morbidity, including vascular dementia	Three CXR reported as normal in complex patient with multiple morbidity
L-132 (89)	Few day h/o haemoptysis	CXR arranged Routine referral chest clinic (6 consults / 17 weeks)	Initial CXR normal; continued to complain of haemoptysis, but described it as 'slight' Abnormal CXR 6 months after normal CXR	Initial CXR normal. Opportunity for earlier referral in patient with ongoing haemoptysis with normal CXR

Appendix E:

Lung cancer – Presentations resulting in referral >1 month after initial consultation (non-chest symptoms)

LUNG CANCER – PRESENTATIONS RESULTING IN REFERRAL >1 MONTH AFTER INITIAL CONSULTATION (NON-CHEST SYMPTOMS)

ID (Age)	Initial Presentation	GP Response and Referral	Potential Explanatory Factors For Time to Referral	Interpretation of Case
L-15 (58)	Epigastric pain, mainly at night (coincided with taking ibuprofen for low back pain)	Prescribed analgesia and PPI; advised to reduce and stop smoking; bloods arranged 2WW referral gastroenterology (3 consults / 6 weeks)	Infrequent attender; patient denied alcohol intake so abnormal GGT was repeated. On the second elevated GGT, an USS was arranged which showed liver metastases. Although this took 6 weeks, seems appropriate response to presentation	Appropriate response to presentation
L-36 (61)	Neck pain with nausea	Bloods arranged Referral gastroenterology (11 consults / 17 weeks); urgent referral gynaecology (13 consults / 34 weeks) arranged	11 consultations in 4 months with symptoms including neck pain and nausea (initial consultation), sinus pain, generalised pruritis, tiredness, and vomiting. Referral made to gastroenterology for dyspepsia and nausea. Upper GI endoscopy showed oesophageal ulcer, gastritis and H pylori positive. Also arranged USS which showed abnormality in pelvis so CT scan arranged. This showed large R adnexal solid soft tissue mass arising R ovary (34 weeks after initial consult); attended gynae oncology clinic, CT abdomen and chest showed features suggestive of pulmonary malignancy R upper lobe. Appears that lung cancer diagnosis was an incidental diagnosis on investigation for ovarian cancer	Incidental diagnosis during Ix for ovarian cancer
L-66 (70)	Painful left arm	Query musculoskeletal; safety netted re: follow-up Referred physiotherapy 1 day after initial consult, orthopaedic referral made at physio's suggestion (8 consults / 13 weeks)	CXR was initially carried out 2 days after initial presentation and was normal. Site of primary tumour never established – non small cell carcinoma invading brachial plexus (presumed lung)	Musculoskeletal sounding presentation and initial normal CXR
L-77 (59)	L arm and neck pain unresponsive to pain killers; lower back pain	Referred physiotherapy Urgent referral (approx 13 weeks)	Presented 12 months before Dx with haemoptysis and cough; CXR normal; referred chest clinic but nothing untoward found; also seen by ENT, given diagnosis of COPD; thereafter only presented for COPD review	Normal Ix for haemoptysis within previous year
L-123 (65)	3 day history of diarrhoea	Bloods and stool sample arranged. Found to be hyponatraemic so CXR done 2WW referral chest clinic (approx 18 weeks)	CXR reported as showing streaky shadowing and some nodules suspected to be secondary to old TB, advised <i>repeat 6/52</i> ; endocrinology advice taken, recommended <i>G/ investigation</i> CXR arranged.; stool culture; USS abdomen, pelvis; CXR; repeat CXR showed suspicious mass	Initial CXR inconclusive