



Northern & Yorkshire Cancer Registry & Information Service

CANCER
OUTCOMES
MONITORING

LUNG CANCER REFERRAL PATTERNS

The Yorkshire Experience

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The Yorkshire Experience

Report produced by

NY *Northern and Yorkshire*
CRIS **Cancer Registry and Information Service**
within the **LEEDS** Teaching Hospitals NHS Trust

CANCER OUTCOMES MONITORING

LUNG CANCER REFERRAL PATTERNS

The Yorkshire Experience

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2.1. FOREWORD

I first came to be interested in the journey of a patient with lung cancer through the health service about 12 years ago. It was reported at that time by the pathology department of the hospital where I work that the diagnosis of lung cancer was confirmed in 1 case for every 4 cases of breast cancer that were identified. I was left wondering why this figure was so small. With the help of the Northern and Yorkshire Cancer Registry it was possible to show that at that time only about half of all patients had a histological diagnosis and that this was much lower than in other countries. It also became apparent, as other studies have confirmed that the survival of lung cancer patients in our part of the world was inferior to that attained elsewhere in Europe. When Professor Charles Joslin undertook the audit project that was being established by what was then The Yorkshire Cancer Organisation I was delighted to accept the invitation to chair the group that was looking at referral patterns in lung cancer. This is the result of that endeavour.

You will see that, once the patients get into the system it works reasonably well for them; the main problems seem to be how do we get the patients with lung cancer to be seen by those who are best able to make the diagnosis and offer a contemporary standard of treatment. So like all good studies this one raises questions which need to be answered by further work.

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2.2. EXECUTIVE SUMMARY

2.2.1. Introduction and Objectives

Lung cancer treatment guidelines assume that most patients present to their GP with a chest symptom, have a chest x-ray and are referred to a chest physician with a probable diagnosis of lung cancer. Clinical experience suggests that this is not always the case. This report presents the results of a study of referrals in lung cancer. The objectives were

- 1) To identify what proportion of patients were referred by their GP with or without a diagnosis, and what proportion were admitted acutely
- 2) To find out what happened to these patients and how many were being managed without specialist input
- 3) To consider the findings to enable improvements in the future operation of the referral process.

As far as we are aware this is the first time that a representative sample of lung cancer patients has been analysed in this way.

2.2.2. Methodology

A randomised and stratified sample of 400 lung cancer cases in the former Yorkshire region was investigated to show the referral pathways that had been followed in each case. The study methodology employed a detailed casenote analysis using both the GP and hospital notes of the study patients. Both sets of notes were obtained in 91% of the sample. A 50 patient pilot study had previously tested the methodology. The recent NYCRIS Key Sites report for lung cancer, which looks at a large lung cancer dataset, shows the study sample to be consistent with the wider population of lung cancer patients. (NYCRIS 1999)

2.2.3. Presentation

The study identified three main groups of lung cancer patients. The first was the “with diagnosis” group comprising 48% of the sample. In these patients the symptoms were mainly respiratory, and their presentation led the GP to order a chest x-ray, and on the basis of an abnormal result, the patient was referred to hospital, usually to a chest physician, with suspected lung cancer. The second group (41% of the sample) who were “without a diagnosis” at the time of referral, had a range of symptoms including respiratory symptoms in 70%. However no chest x-ray was done and the patients were referred to a variety of hospital specialties. The diagnosis of lung cancer was then made at the hospital. The remaining 11% presented themselves acutely to a variety of specialties. The acute group exhibited a similar age and sex pattern to the patients in the other groups, but in two-thirds of cases their admission was not related to any lung complaint.

Referrals to specialists, investigations and treatment varied between these three groups.

2.2.4. Referral to Specialists

82% of the “with diagnosis” group were referred initially to a chest physician, with 5% being referred to a thoracic surgeon and 5% to a physician in medicine for the elderly. However 30% in the “without diagnosis” group were first referred to a physician in medicine for the elderly, with 22% to a chest physician and 20% to general medicine. 44% of the acute group were admitted to general medicine or chest physicians, 12% to medicine for the elderly, 7% to general surgery and 37% to other specialties.

96% of the “with diagnosis” group were managed by a specialist, whereas 63% of the “without diagnosis” group and 61% of the acute group were so managed. However 23% of the “without diagnosis” group and 20% of the acute group did receive an opinion from a specialist. Of concern is the fact that one in seven of all “without diagnosis” and acute patients did not receive either specialist management or a specialist opinion. 90% of the patients were managed by either one or two consultants; just 9% were managed by three. In total there were seventy different referral pathways to and within the hospital in terms of the specialities involved.

2.2.5. Investigations

Once diagnosed it might have been anticipated that all patients might then follow a similar investigative pathway. However there were marked differences between the groups in the extent to which the major investigative techniques were deployed. Bronchoscopy was performed in 85% of the “with diagnosis” group, but in only 60%

of those “without diagnosis,” and in 56% of the acute group. CT scans were done a little more frequently in the “with diagnosis” group, 43.4% against 37.2%. Mediastinoscopy, a specialist staging investigation, was performed in 8.7% of those “with diagnosis” but in only 1.4% of the “without diagnosis” group. In the acute group only 48% had histological confirmation compared to 68% of the other two groups.

2.2.6. Treatment

Treatment rates vary between the three groups. The “with diagnosis” group were twice as likely to have surgery, 12.7% compared to 6.1% of the “without diagnosis” group and only 2.4% of the acute group. 2.4% of the acute group received radical radiotherapy, which was twice as often as the other two groups. 13.3% of the “with diagnosis” group received chemotherapy compared to 10.8% of the “without diagnosis” group and 12.2% of the acute group. The use of palliative radiotherapy was more common in the “with diagnosis” group, 34% compared to 25% in the “without” group and 27% of the acute group. These variations lead to a cumulative difference in the proportions not receiving active treatment. Of the “with diagnosis” patients only 36.4% received best supportive care in contrast to 57% of the “without diagnosis” and acute groups.

Treatment was also related to the number of managing consultants. Patients managed by just one consultant had a much lower treatment rate (13%) compared to those managed by 2 consultants (70%).

2.2.7. Management Intervals

The interval between start of symptoms and first hospital visit was quite variable. The median for the “with diagnosis” group was longer at 29 days, in contrast to only 13 days for the “without diagnosis” group. This was presumably influenced by the time for arranging and reporting the chest x-ray in the “with diagnosis” group. A quarter of patients took 42 days or longer from symptoms to first hospital visit.

The time intervals between GPs requesting an x-ray and a referral being made were also quite variable with a median of seven days and 95% achieved in 22 days or less. The intervals from the GP’s chest x-ray request to the first hospital visit again revealed a variable pattern with a median of 17 days. Two thirds were seen within the guidelines recommended three weeks of the x-ray request but the final third took much longer, with the 95th percentile taking 49 days. It should be noted that 80% of the “with diagnosis” cases were seen within 2 weeks of referral by a GP.

There were delays in many cases between clinical diagnosis and receiving treatment, which need to be investigated to discover avoidable causes. Decisions not to treat were made quickly, with a median of 16 or 18 days in the two main groups, whereas in the “with diagnosis” group the median time to treatment was 7 weeks, and 5 weeks in the “without diagnosis” group.

2.2.8. Conclusion

Less than half of lung cancer patients present to hospital with a diagnosis. There are a very large number of referral pathways to specialist care but 9% of patients receive no specialist input at all. Investigation and treatment rates are very low overall, particularly in patients who present atypically.

This study provides no adequate information as to whether the low rates of treatment are appropriate. Further research is required into the casemix of patients presenting

with and without a diagnosis, and acutely. It is known from the Key Sites study that treatment rates vary between districts in Yorkshire and that these may be associated with non-specialist management. (NYCRIS 1999).

The implications of this study are that

- local guidelines need to be adjusted to take account of the diversity of presentations
- where practicable all lung cancer patients are cross-referred to respiratory physicians
- time intervals from hospital presentation to treatment need to be audited to reduce avoidable delays.

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2.3. ACKNOWLEDGEMENTS

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3.1. LUNG CANCER OVERVIEW

Lung cancer is the commonest cause of cancer death in the world with over 37000 cases being diagnosed in the UK each year. (ONS 1998) Tobacco smoking has been shown to account for about 80% to 90% of all cases among men and 50% to 80% in women. (Nordlund 1998, DoH 1993) The survival statistics are the worst for all but a few of the rarest malignancies, and have not improved significantly in recent years. The median survival overall in the UK is between 4 and 6 months, (Joslin 1995) with a 5 year survival of about 6%. (DoH 1993, Quickdata 1999) It is also a highly symptomatic disease, a feature which, when combined with the poor survival figures, makes prompt referral and good teamwork essential at every stage of its management. (COG 1998, Calman Hine 1995) There has been little change in the overall survival in the UK but other European countries have higher survival rates.(Janssen-Heijnen 1998) Many advances have the potential to contribute to a significantly improved standard of care. (COG 1998) Many of these demand a high degree of specialisation. (Selby 1996)

Guidelines for lung cancer management always seem to assume that patients with lung cancer present in a typical fashion. Respiratory symptoms lead to a general practitioner consultation and then a referral, usually via an abnormal radiograph, to a chest physician and a standard hospital pathway of diagnosis and management. (BTS 1998, SIGN 1998, SMAC 1994) Clinical experience however indicates that this is far less typical than is generally believed.

Since the Calman Hine report there has been increasing emphasis on making sure that cancer services provide access to specialist care for all patients with a working diagnosis of lung cancer. The possibility that a large proportion of patients might present to and be managed by non-specialists could profoundly effect the speed with which this could happen. There has never been a rigorous examination of referral pathways for lung cancer and this is now needed so that the pattern can be appreciated and service plans adjusted accordingly.

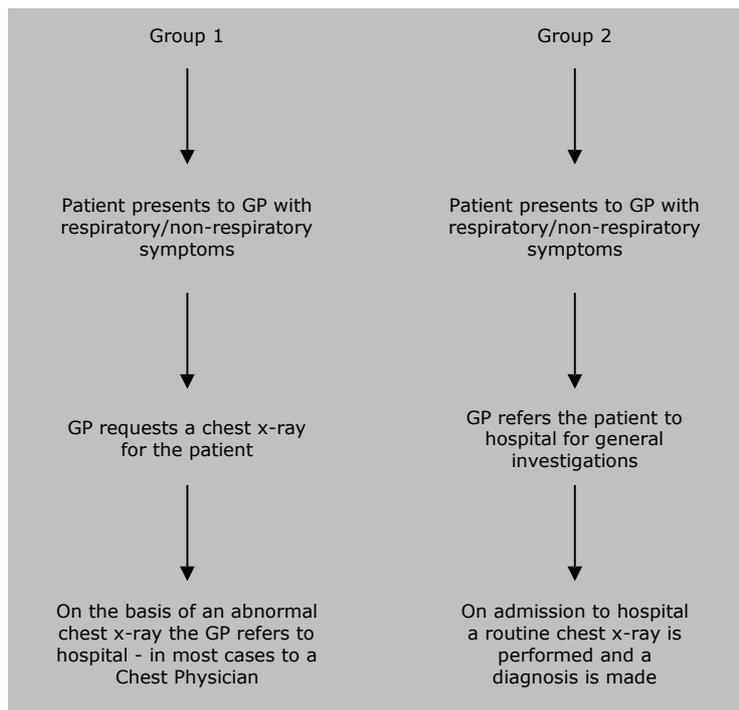
We have sought to provide this information using the relatively detailed database provided by the Northern & Yorkshire Cancer Registry. A 50 patient pilot study showed that we could obtain satisfactory information from patients' general practitioner and hospital records. We therefore expanded this to a definitive study; using a randomised stratified sampling technique, to obtain data representative of lung cancer patients in Yorkshire. This experience is likely to be similar to that across the United Kingdom.

3.2. OVERVIEW OF STUDY METHODOLOGY

3.2.1. Objectives and Design

In the Standing Medical Advisory Committee (SMAC 1994) document - the authors state that “most patients present to their doctors with respiratory symptoms, and often with some indication of systemic illness”. However the data from our pilot study showed two distinct referral pathways for patients with lung cancer, which are detailed below:

▼ Referral Pathways for Lung Cancer



The aim of this extended study was to look at both presentation groups - the “with diagnosis” group where a pre-diagnosis is made by the GP from an abnormal chest x-ray and the “without diagnosis” group where presentation to hospital is either made due to an unrelated problem or as an acute case and lung cancer is diagnosed during routine investigations. A third much smaller group of patients were admitted acutely, having presented themselves to hospital.

3.2.2. Primary Aims

This study had the following primary aims:

- 1) To identify what proportion of patients were referred by their GP with or without a diagnosis, and what proportion were admitted acutely
- 2) To find out what happened to these patients and how many were being managed without specialist input
- 3) To consider the findings to enable improvements in the future operation of the referral process.

3.2.3. Subsidiary Aims

The SMAC report recommends that a diagnosis of lung cancer should not be unduly delayed. Therefore in addition to these main aims there are also several subsidiary aims:

For the “with diagnosis” group:

- To estimate the proportion of patients for whom the interval between the date of the chest x-ray ordered by the GP and first hospital visit exceeds 3 weeks.
- To estimate the proportion of patients for whom the interval between the first hospital visit and start of treatment (or decision not to treat) exceeds 5 weeks.
- For those cases where the interval between the date x-ray requested by the GP and the 1st hospital visit exceeds 3 weeks, investigate the reasons for this by examining the constituent parts of the referral process in primary care i.e. referral for chest x-ray, results reported to GP and delay in out-patient appointments.
- For those cases where the interval between first hospital visit and the treatment decision exceeds 5 weeks, investigate the reasons for this by examining the constituent parts of the hospital experience i.e. delays in referral to a lung cancer specialist, referrals between specialists, diagnostic investigations and disease assessments.

For the “without diagnosis” group:

- To estimate the proportion of patients for whom the interval between clinical diagnosis (at hospital) and start of treatment (or decision not to treat) exceeds 6 weeks.
- To investigate the reasons why some cases exceed the 6 week interval, (between clinical diagnosis and treatment decision) taking into account the constituent parts of the hospital experience i.e. delays in referral to a lung cancer specialist, referrals between specialists, diagnostic investigations and disease assessments.

3.2.4. Eligibility Criteria

The SMAC document was introduced in 1994 and 1993 was therefore chosen as the basis for this study in order to provide baseline data. The following eligibility criteria were used to identify the sample of patients.

- any type of lung cancer - including non-histologically confirmed cases
- incident in 1993 and recorded by the Cancer Registry
- resident in the Yorkshire region
- not managed entirely extra-regionally
- not treated privately

3.2.5. Sample Selection

The primary aim of this study was to investigate the efficiency of both GP and Hospital services in the referral process. A number of factors might have had an effect on these aims and there was one factor in particular that could have had a significant impact on the results of the study, if not accounted for at the outset.

In the discussions of the pilot study results, the group felt that there was one particular factor which had an effect on the findings. This was the age of the patient at presentation. It was felt that the age of a patient played a large part in the initial referral process with, for example, the "older" patients being automatically admitted under the care of physicians in medicine for the elderly as opposed to "younger" patients being managed by chest specialists. This could significantly increase the time it takes for a patient to receive specialist management. It was therefore important for the sample to be representative of the whole population and for this reason it was decided to stratify by patient age to adjust for the expected variations. Patients were categorised into three age groups:

- <65 years
- 65-75 years
- >75 years old.

In addition to patient age as a stratification factor, it was also felt that area of residence (i.e. Health Authority) may have an impact on the results of this study. In order to obtain a representative picture of the whole region the sample was also stratified according to Health Authority.

3.2.6. Ethical Considerations

Permission for access to the casenotes was sought and secured from both the Family Health Services Authority (FHSA) and the primary consultant in charge of the patient. Ethical Committee approval was also obtained from all the local research ethics committees in the region prior to commencement of the study.

3.2.7. Data Collection Methods

For the sample selected, introductory relevant baseline information was extracted from the Cancer Registry database. The FHSA and primary managing clinician of each of these patients were contacted and their permission to view the casenotes obtained. GPs were contacted in the case of living patients. Local Research Ethics Committee approval was also sought and obtained for each area. Once received, the GP and hospital notes were reviewed by one trained member of the Monitoring Unit and the data were recorded on case report forms designed specifically for the study. In a number of cases, the notes were reviewed by two individuals and the results compared to ensure consistency of recording.

The following data items were extracted from the case notes:

- Patient details
- Management by GP
- Management by all Consultants at all Hospitals involved
- Death details/last appointment date

ANALYSIS SAMPLE

4.1. DATA COMPLETENESS

4.1.1. All Cases Combined

This analysis focuses on the data collected on all 400 patients in the study. The vast majority of casenotes were located with both GP and Hospital casenotes being traced for 362 patients (90.5%). In addition, there were 16 (4%) cases where GP details were recorded but Hospital notes were untraceable. Details of all cases are given in the table below.

▼ Data Completeness

Reason	Number of Patients	%
GP & Hospital notes	362	90.5%
GP notes only	16	4.0%
GP & Hospital notes missing	11	2.7%
Other exclusions*	11	2.7%
Total	400	100.0%

A problem associated with all retrospective reviews relates to the interpretation of the notes where no reference is made to particular actions of interest, such as bronchoscopy. In such cases it has been assumed that the procedure of interest was not performed. Consequently, all data items considered in this analysis appear to be complete, with the exception of those relating to the management intervals. Details of the completeness of these items are included in the relevant sections of the report.

4.1.2. By Strata

▼ Distribution of all 1993 NYCRIS Lung Cancer Cases By Health Authority & Age Group (n= 2635)

	<65	65-75	75+	Totals
Bradford	3.37	4.73	4.15	12.26
East Riding	3.99	6.62	5.84	16.45
Leeds	5.47	9.63	7.57	22.67
North Yorkshire	3.37	7.61	6.13	17.11
South Humber	2.39	3.78	2.17	8.35
Wakefield	2.80	3.74	2.14	8.68
Calderdale & Kirklees	4.24	5.84	4.40	14.48
Totals	25.63%	41.95%	32.40%	100%

▼ Distribution of this study's Lung Cancer Cases By Health Authority & Age Group (n=400)

	<65	65-75	75+	Totals
Bradford	3.25	4.75	4.25	12.25
East Riding	4.00	6.75	5.75	16.50
Leeds	5.50	9.75	7.50	22.75
North Yorkshire	3.25	7.50	6.25	17.0
South Humber	2.25	3.75	2.25	8.25
Wakefield	2.75	3.75	2.25	8.75
Calderdale & Kirklees	4.25	5.75	4.50	14.5
Totals	25.25%	42.00%	32.75%	100%

The distribution of lung cancer cases (given as percentages) in each health authority and age strata are similar in the lung cancer referral pattern study to that of the total lung cancer cases registered with NYCRIS in the same year. The 38 excluded cases did not seem to differ from other patients with regard to age group. The proportions were

21% under age 65, 47% age 65-75, and 32% over age 75. There were cases excluded from all health authorities but proportionately there were more excluded from North Yorkshire (23.7%), and fewer from West Yorkshire (2.6%).

There have been some small changes in the boundaries of East Riding, South Humber (then United Health) and North Yorkshire Health Authorities since the analysis was done, but these changes do not effect the comparison of the two studies.

4.2. PATIENT CHARACTERISTICS & MANAGEMENT

4.2.1. Sample Representativeness

The recently published Key Sites Study report for Lung Cancer (NYCRIS 1999) provides data to establish the representativeness of the study sample in relation to all lung cancer registrations in Yorkshire for the time period 1986-94, using the data for 1993 only.

▼ Representativeness of Study Sample

Factor		Key Sites Study*	Referral Study
Sex	Male	1695 64.3%	226 62.4%
	Female	940 35.7%	136 37.6%
Age Group	<65	668 25.4%	96 26.5%
	65-74	1081 41.0%	153 42.3%
	75+	886 33.6%	113 31.2%
Histological Confirmation	Yes	1737 66.0%	247 68.2%
	No	896 34.0%	115 31.8%
Tumour Type	Non-Small Cell	1344 51.05%	185 51.1%
	Small Cell	395 15.0%	62 17.1%
	Clinical	896 34.0%	115 31.8%
Treatment	Surgery	283 10.7%	32 8.8%
	Radiotherapy	968 36.7%	112 30.9%
	Chemotherapy	278 10.6%	44 12.2%
	Other	38 1.4%	4 1.1%
	None	1276 48.4%	170 47.0%

* Using 1993 data only.

INITIAL PRESENTATION

5.1. MODE OF PRESENTATION

The initial pilot study identified three different routes of presentation for lung cancer patients. The same categorisation was used for the main study.

With Diagnosis

A typical patient in this group presented to their GP with a respiratory related complaint. A chest x-ray was requested by the GP and, on the basis of an abnormal result and the Radiologist's advice, the GP referred the patient to hospital.

Without Diagnosis

There were two kinds of patient in this group. The first type of patient presented to their GP with a respiratory related complaint and the GP referred to hospital immediately without confirming their preliminary diagnosis with a chest x-ray. The second type of patient presented to their GP with a non-respiratory related complaint and the GP referred them to hospital for investigation of those symptoms. In both cases the important defining criteria was that the GP did not corroborate the suspected diagnosis of lung cancer with a chest x-ray prior to referral.

Acute

This group of patients did not present to their GP at all. In most cases they were admitted directly from Accident and Emergency following self-presentation. However a small proportion arrived following a collapse at home and a 999 call to the ambulance service.

▼ Summary of Study Groups

Group	n	%
With Diagnosis	173	47.8%
Without Diagnosis	148	40.9%
Acute	41	11.3%
Totals	362	100.0%

Guidelines for lung cancer management seem to assume that patients with lung cancer present in a typical fashion. Respiratory symptoms lead to a general practitioner consultation and then a referral, usually via an abnormal radiograph, to a chest physician and a standard hospital pathway of diagnosis and management. The results from this study however indicate that this is far from the truth. Just over 50% of patients do not follow this conventional pathway.

5.1.1. Summary

▼ Summary of all Patient Characteristics In The Whole Study & Within The 3 Presentation Groups

Factor		All Cases	With Diagnosis	Without Diagnosis	Acute
Sex	Male	226 62.4%	105 60.7%	97 65.5%	24 58.5%
	Female	136 37.6%	68 39.3%	51 34.5%	17 41.5%
Age Group	<65	96 26.5%	44 25.4%	41 27.7%	11 26.8%
	65-75	153 42.3%	85 49.1%	49 33.1%	19 46.3%
	75+	113 31.2%	44 25.4%	58 39.2%	11 26.8%
Histological Confirmation	Yes	247 68.2%	139 80.3%	87 58.8%	21 48.8%
	No	115 31.8%	34 19.7%	61 41.2%	20 51.2%
Tumour Type	Non-Small Cell	185 51.1%	112 64.7%	60 40.5%	13 31.7%
	Small Cell	62 17.1%	27 15.6%	27 18.2%	8 19.5%
	Clinical	115 31.8%	34 19.7%	61 41.2%	20 48.8%
Total cases in each group	% in each group of all cases	362 100%	173 47.8%	148 40.9%	41 11.3%

Nearly two thirds of patients in the study were male and approximately a third were aged over 75 years of age. Histological confirmation was 68% and the largest histological type group was non-small cell lung cancer at just over 51%. Just 9% of patients received surgery and only 1% radical radiotherapy. 47% did not receive any active treatment and their symptoms were managed palliatively.

There are some differences between the presentation groups. There are fewer females and a higher proportion of over 75s in the “without diagnosis” group compared to the other two groups. Histological confirmation is 20-30% higher in the “with diagnosis” group, thus explaining the many more clinically diagnosed cases in the other two groups. There is a slightly higher proportion of small cell cancers in the “without diagnosis” and acute groups than in the “with diagnosis” group.

5.2. SYMPTOMATIC PRESENTATION

General practitioner case notes were carefully examined to identify presenting symptoms. Some patients had long histories of respiratory complaints that made the identification of the consultation leading to the diagnosis of lung cancer difficult to pinpoint. Some patients presented with multiple symptoms and in these cases all symptoms were recorded.

5.2.1. Presenting Symptoms

▼ Presenting Symptoms for the “With Diagnosis” and “Without Diagnosis” Groups

Symptoms	With Diagnosis	Without Diagnosis
Cough	57 32.0%	16 10.8%
Chest Pain	26 14.6%	16 10.8%
Chest Infection	26 14.6%	14 9.5%
Shortness Of Breath	22 12.4%	24 16.2%
Haemoptysis	18 10.1%	7 4.7%
Weight Loss	12 6.7%	14 9.5%
Other Pain	7 3.9%	23 15.5%
Other (Non-Respiratory)	17 9.6%	44 29.7%

173 patients in the “with diagnosis” group presented to their GP with a variety of different respiratory associated symptoms, the most common being cough, chest pain and chest infection. As described in the introduction to this section, patients presented in many cases with more than just one symptom but this table lists the principal symptom (or occasionally principal two symptoms) of each case.

Although the “without diagnosis” group did not have a chest x-ray performed prior to referral, a significant percentage presented with respiratory related symptoms. Only a third of patients presented with non-respiratory symptoms and these are grouped together under the “other” heading in the above table.

▼ Reason for Admission in the Acute Admission Group

Admission Reason	n	%
Lung related	15	36.6%
Non-lung related	26	63.4%

Just over a third of acute admissions were admitted for lung related reasons.

5.2.2. Specialty of Initial Referral

▼ Specialty of First Consultant by Study Group

Specialty	All Cases	With Diagnosis	Without Diagnosis	Acute
Chest Physician	180 49.7%	141 81.5%	33 22.3%	6 14.6%
Thoracic Surgeon	9 2.5%	9 5.2%	0 0.0%	0 0.0%
General Medicine	54 14.9%	12 6.9%	30 20.3%	12 29.3%
Medicine for the Elderly	58 16%	8 4.6%	45 30.4%	5 12.2%
General Surgery	15 4.1%	2 1.2%	10 6.8%	3 7.3%
Other	46 12.7%	1 0.6%	30 20.3%	15 36.6%
Totals	362 100.0%	173 100.0%	148 100.0%	41 100.0%

Overall just 52% of patients were initially referred to (or admitted to the care of) a lung cancer specialist, but this figure is nearer 87% when looking at the “with diagnosis” patients and only 22% for the “without diagnosis” and “acute” groups. All Cardio-Thoracic Surgeons, all Chest Physicians and all Medical and Clinical Oncologists were classed as “lung cancer specialists” and all other specialties were classed as non-specialists.

However, in the “with diagnosis” group, where the GP is referring to hospital already with x-ray evidence of the presence of a lung tumour, 23 patients (13%) were not referred initially to a specialist. The “without diagnosis” patients presented mainly with lung related symptoms but only 22% were initially referred to a lung cancer specialist with 30% being referred to a Physician in Medicine for the Elderly and 20% to a General Physician.

5.2.3. Acute Admission Group - Specialty to which Admitted

▼ Acute Admission Group - Specialty of Admitting Consultant

Specialty	All cases	Lung Symptoms	Non-Lung Symptoms
Chest Physician	6 14.6%	2 33.3%	4 66.7%
General Medicine	12 29.3%	6 50.0%	6 50.0%
Medicine for the Elderly	5 12.2%	3 60.0%	2 40.0%
General Surgery	3 7.3%	0 0.0%	3 100.0%
Other	15 36.6%	4 26.7%	11 73.3%
Totals	41 100.0%	15 36.6%	26 63.4%

14.6% of the acute group were admitted directly into the care of a specialist with the remainder distributed across a wide range of other specialties, especially those patients admitted with a non-respiratory symptom. There may be some misclassification of admission specialties due to the dual roles of some consultants as general and chest physicians for example, and to the on call policies of hospitals.

5.2.4. Specialist Management

▼ Specialist Management by Study Group

Specialist Management	All Cases		With Diagnosis		Without Diagnosis		Acute	
Managed by a Specialist	284	78.4%	166	96.0%	93	62.8%	25	61.0%
Opinion Given but not Managed by a Specialist	46	12.7%	4	2.3%	34	23.0%	8	20.0%
No Specialist Management or Opinion	32	8.8%	3	1.7%	21	14.2%	8	20.0%
Total	362	100.0%	173	100.0%	148	100.0%	41	100.0%

Whatever their pathway of referral, it is important that all lung cancer patients, regardless of their age, performance status or place of residence are offered a uniformly high standard of care. Ideally, all lung cancer patients should be assessed by at least one lung cancer specialist. For the purposes of this study, the definition of a lung cancer specialist was based upon the clinical discipline of each consultant.

In total there were 70 different referral pathways for patients with lung cancer although overall 78.4% of patients were actually managed by a lung cancer specialist and an additional 12.7% had input into their management from a specialist without transfer of care. Therefore 8.8% (32 cases) did not receive any specialist management or opinion during their illness.

There was a large difference in the level of specialist management between the three groups. 96% of the “with diagnosis” group were actually managed by a specialist compared to just 63% of the “without diagnosis” group and although an additional 23% of this group did receive the opinion of a specialist in their management, just over 14% remained without a specialist contribution to their care. The acute group received even less specialist care.

A detailed breakdown of all 70 unique referral pathways is given in the appendix. (Section 8.2)

5.2.5. Number of Managing Consultants

▼ Number of Managing Consultant by Group

No. of Managing Consultants	All Cases		With Diagnosis		Without Diagnosis		Acute	
1	126	39.3%	62	35.8%	64	43.2%	15	36.6%
2	164	51.1%	93	53.8%	71	48.0%	16	39.0%
3	30	9.3%	17	9.8%	13	8.8%	10	24.4%
4	1	0.3%	1	0.6%	0	0.0%	0	0.0%
Total	362	100%	173	100.0%	148	100.0%	41	100.0%

Only 1 patient (a “with diagnosis” case) was managed by 4 different consultants. 36% of the “with diagnosis” group were managed by just one consultant compared with 43% of the “without diagnosis” group.

5.2.6. Diagnostic Investigations

▼ Diagnostic Investigations by Study Group

Investigation	All Cases		With Diagnosis		Without Diagnosis		Acute	
Bronchoscopy	236	73.5%	147	85.0%	89	60.1%	23	56.1%
Mediastinoscopy	17	5.3%	15	8.7%	2	1.4%	1	2.4%
CT Scan	130	40.5%	75	43.4%	55	37.2%	17	41.0%
1 Other	192	59.8%	96	55.5%	96	64.9%	19	48.0%
2 Other	72	22.4%	36	20.8%	36	24.3%	4	9.5%
3 Other	18	5.6%	5	2.9%	13	8.8%	0	0.0%

Bronchoscopy was the main diagnostic investigation with higher rates for the “with diagnosis” group (85.0%) than the “without diagnosis” group (60.1%). Relatively few

mediastinoscopies were performed, but when they were, the vast majority were undertaken in the “with diagnosis” group. Overall 40.5% received a CT Scan and 59.8% had at least one further investigation performed, which in most cases meant ultrasound or pleural cytology. The acute group had fewer investigations than either of the other two groups.

5.2.7. Treatment

▼ Treatment by Study Group

Treatment	All cases	With Diagnosis	Without Diagnosis	Acute
Surgery	32 8.8%	22 12.7%	9 6.1%	1 2.4%
RT (Radical)	5 1.4%	2 1.2%	2 1.4%	1 2.4%
Chemotherapy	44 12.2%	23 13.3%	16 10.8%	5 12.2%
RT (Palliative)	107 29.6%	59 34.1%	37 25.0%	11 26.8%
Other	4 1.1%	4 2.3%	0 0.0%	0 0.0%
Best Supportive Care	170 47.0%	63 36.4%	84 56.8%	23 56.1%
Total	362 100.0%	173 100.0%	148 100.0%	41 100.0%

For the purposes of this study, only treatment given to the tumour was recorded as “definitive” and therefore in a lot of cases general palliative treatment was not recorded and is identified in the above table as “best supportive care.”

The overall treatment rates were surgery 8.8%, radical radiotherapy 1.4% and chemotherapy 12.2%. Just over half the patients received any treatment. The percentage of patients receiving treatment varied considerably according to admission group. Over 27% of the “with diagnosis” group received radical treatment compared with just 18% of the “without diagnosis” group and 17% of the “acute” group. Only one of the acute group received surgery (2.4%) and one received radical radiotherapy. Palliative radiotherapy rates were also higher in the “with diagnosis” group. Best supportive care was all that was given to 57% of the “without diagnosis” and acute groups, compared to 36% of the “with diagnosis” group. Treatment was also related to the number of managing consultants. Patients being managed by just one consultant having a much lower treatment rate (13%) compared to those managed by 2 consultants (70%).

5.3. REFERRAL INTERVALS

In the SMAC document, the authors state that “most patients present to their doctors with respiratory symptoms, and often with some indication of systemic illness.” The aim of this study was to look at both presentation groups - the “with diagnosis” group where a pre-diagnosis is made by the GP from an abnormal chest x-ray and the “without diagnosis” group where presentation to hospital is either made due to an unrelated problem or as an acute case and lung cancer is diagnosed during routine investigations. The SMAC report recommends that a diagnosis of lung cancer should not be unduly delayed, and the intervals outlined below are based on the guidance given in that report.

With diagnosis

- to estimate the proportion of patients for whom the interval between the date of the chest x-ray ordered by the GP and the first hospital visit exceeds 3 weeks.
- to estimate the proportion of patients for whom the interval between the first hospital visit and the start of treatment (or decision not to treat) exceeds 5 weeks.

Without diagnosis

- to estimate the proportion of patients for whom the interval between clinical diagnosis (at hospital) and start of treatment (or decision not to treat) exceeds 6 weeks.

Lung cancer symptoms often develop over a very long period of time and it is often difficult to pinpoint with accuracy the time of first symptoms. In this study we attempted to identify the date of the first presentation to the GP of the patient with the symptoms which when investigated led to the diagnosis of lung cancer.

5.3.1. Symptom to First Hospital Visit

This interval was calculated for all “with diagnosis” and “without diagnosis” patients. Data were available for 304 of the 321 patients (94.7%).

▼ **Interval between Symptoms and First Hospital Visit (shown in days)**

Group	Number	Minimum	Median	Maximum
All Patients	304	0	22	439
With Diagnosis	167	1	29	439
Without Diagnosis	137	0	13	174

The median interval between first symptoms and first hospital visit was 22 days for all patients but showed some variation between the two groups, 29 days for the “with diagnosis” patients and 13 days for the “without diagnosis” group. The graph below highlights the 5th, 25th, 50th, 75th and 95th percentile for all three groups.

The very long intervals in one or two patients were reviewed. These were not due to failures of the organisation of care but to clinical decisions to treat later. These cases were not typical.

▼ **Interval percentiles between Symptoms and First Hospital Visit**



Thirty five patients in the “without diagnosis” groups were referred to hospital by their GP directly on the day their symptoms were first mentioned in the notes therefore the 5th and 25th percentiles coincide. This is to some extent an artefact from classification of the groups and difficulties in data collection from casenotes.

5.3.2. GP Chest X-Ray Request to Referral

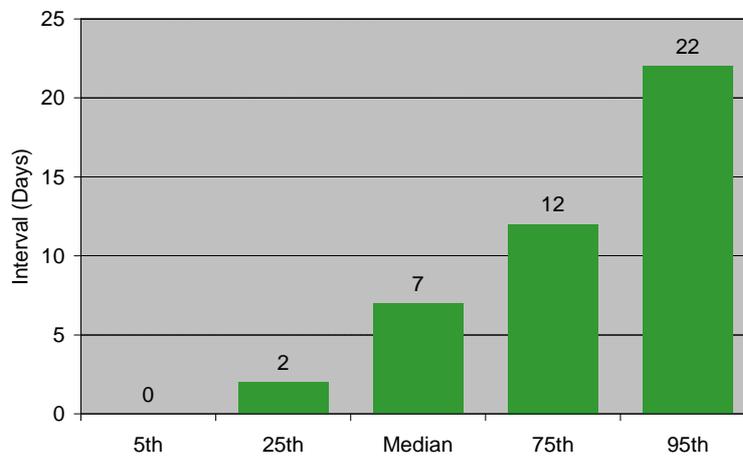
▼ Interval between GP Requesting a Chest X-Ray and Referral

Interval	Days
No	146
Min	-1
Max	142
Median	7

This interval was calculated for the “with diagnosis” group who had a chest x-ray performed at the request of their GP. Data were available for 146 of the 173 cases. The negative interval of -1 is an artefact of the way in which the data was collected and interpreted. This patient was referred before the GP requested the chest x-ray.

The median interval was 7 days and although the maximum was 142 days, 95% of patients were referred within 22 days of the GP initially requesting the chest x-ray. The graph below highlights the 5th, 25th, 50th, 75th and 95th percentiles.

▼ Interval Percentiles for GP Requesting a Chest X-Ray and Referral



5.3.3. GP Chest X-Ray Request to First Hospital Visit

The key aim associated with this interval was:

- to estimate the proportion of patients for whom the interval between date x-ray ordered by the GP and First Hospital Visit exceeds 3 weeks.

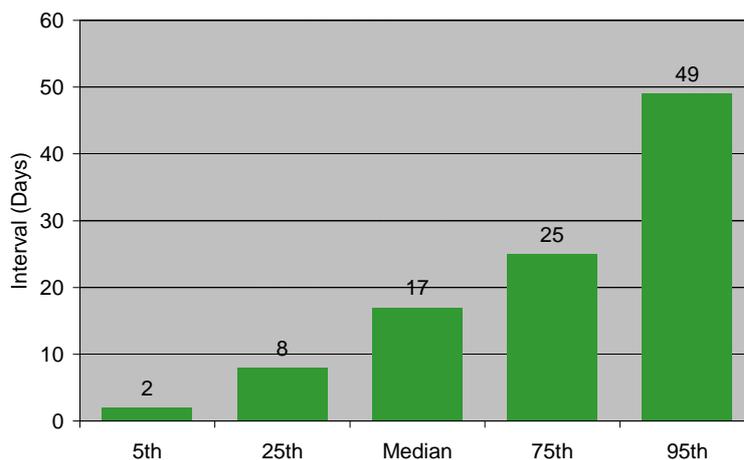
▼ **Interval between GP Requesting the X-Ray and First Hospital Visit (in days)**

Interval	Days
no	150
min	0
max	148
median	17

This interval was calculated for the “with diagnosis” group who had a chest x-ray performed at the request of their GP. Data were available for 150 of the 173 cases.

95 of 150 patients (63.3%) were seen within the 3 weeks recommended by the guidelines. However, 55 of 150 patients (36.6%) took longer than 3 weeks to be seen at hospital following the GP’s request for a chest x-ray. The graph highlights the 5th, 25th, 50th, 75th and 95th percentiles.

▼ **Interval Percentiles GP Requesting the X-Ray and First Hospital Visit (in days)**



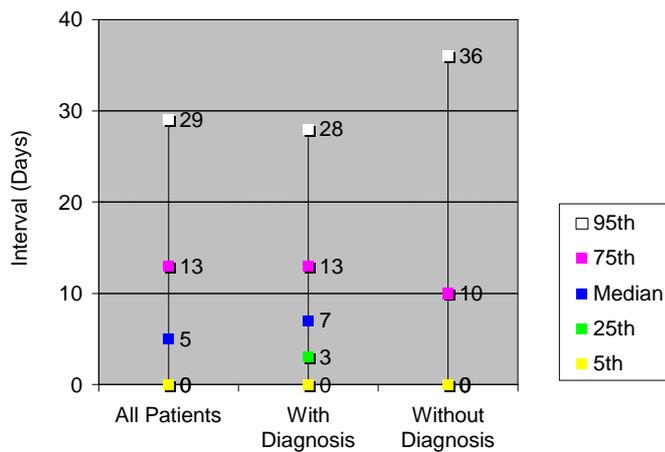
5.3.4. GP Referral to First Hospital Visit

▼ Interval between GP Referral and First Hospital Visit

Group	Number	Minimum	Median	Maximum
All Patients	307	0	5	57
With Diagnosis	167	0	7	56
Without Diagnosis	140	0	0	57

This interval was calculated for all “with diagnosis” and “without diagnosis” patients. Data were available for 307 of the 321 patients (95.6%). The graph below highlights the 5th, 25th, 50th, 75th and 95th percentile for all three groups.

▼ Interval Percentiles for GP Referral to Hospital Visit



Some of the percentiles overlap in the “without diagnosis” group as 80 cases were referred to hospital urgently by their GP , with 54 admitted that day.

In this study 80% of the “with diagnosis” group were seen within 2 weeks. Information was available for 167 of 173 cases. 81% of the “with diagnosis” group were seen within 2 weeks. Data available for 140 of 148 cases. Overall only 19.5% of referred cases were not seen within 2 weeks.

5.3.5. First Hospital Visit to Treatment (or Decision Not to Treat)

This interval was calculated for the “with diagnosis” group. Data were available for 156 of the 173 cases (90.2%). The missing data related to a decision not to treat in all 17 patients.

The key aim associated with this interval between first hospital visit and treatment (or decision not to treat) was as follows:

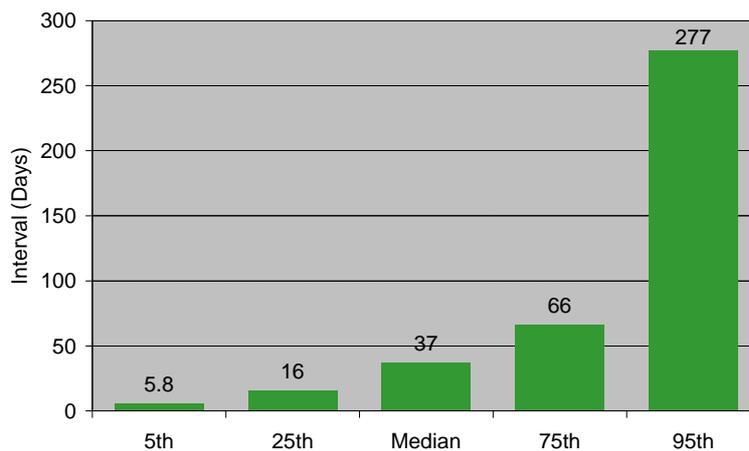
- to estimate the proportion of “with diagnosis” patients for whom the interval between first hospital visit and start of treatment (or decision not to treat) exceeds 5 weeks.

▼ **Interval between First Hospital Visit and Treatment (With Diagnosis)**

	Number	Minimum	Median	Maximum
With Diagnosis	156	0	37	487

75 of 156 patients (48.1%) received treatment or a management decision was taken within the 5 weeks recommended by the guidelines. However, 81 of 150 patients (51.9%) took longer than 5 weeks for treatment to begin or a management decision to be made.

▼ **Interval Percentiles for First Hospital Visit and Treatment (With Diagnosis)**



When looking at the group of patients who actually received treatment, then the median interval was slightly longer at 42.5 days. A decision not to treat was made much more quickly and the median interval for this group was just 15.5 days.

5.3.6. Clinical Diagnosis to Treatment (or Decision Not to Treat)

This interval was calculated for the “without diagnosis” group. Data were available for only 128 of the 148 cases (86.5%). The missing data related to a decision not to treat in all 20 patients.

The key aim associated with this interval between clinical diagnosis and treatment (or decision not to treat) was as follows:

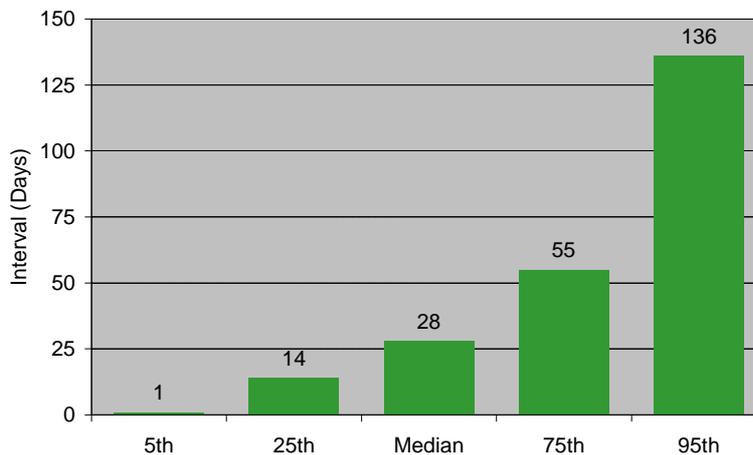
- to estimate the proportion of “without diagnosis” patients for whom the interval between clinical diagnosis (at hospital) and start of treatment (or decision not to treat) exceeds 6 weeks.

▼ **Interval between Clinical Diagnosis and Treatment (Without Diagnosis)**

Interval	Number	Minimum	Median	Maximum
Without Diagnosis	128	-2	28	171

87 of 128 patients (68.0%) received treatment or a management decision was taken within the 6 weeks recommended by the guidelines.

▼ **Interval Percentiles for Clinical Diagnosis and Treatment (Without Diagnosis)**



However, 41 of 128 patients (32.0%) took longer than 6 weeks for treatment to begin or a management decision to be made.

When looking at the group of patients who actually received treatment, then the median interval was slightly longer at 36.5 days. A decision not to treat was made much more quickly and the median interval for this group was just 18 days.

6.1. DISCUSSION

6.1.1. Summary of Main findings

This study has shown referral patterns for lung cancer in detail for the first time. Comparisons of these results can be made with various national guidelines. (See appendix 8.1 for relevant extracts.)

Half of all lung cancer patients are referred, or admitted acutely, without a provisional diagnosis of lung cancer. These patients are less likely to receive a specialist opinion and experience lower rates of key diagnostic investigations. Less of them are treated actively for their lung cancer.

6.1.2. Representativeness

The study sample was representative for age, sex, histology and treatment compared with the larger Yorkshire Key Sites study (NYCRIS 1999). It is likely to be representative of presentation in the UK although not necessarily of patterns abroad.

6.1.3. Differences between Groups

There is some variation between the groups in age, sex and tumour type. As expected there are nearly twice as many men than women, but with a slightly lower proportion of men in the acute group. The “without diagnosis” group has a lower percentage of 65-75 year olds, and a higher percentage of over 75s. The rates of histological confirmation are far lower in the “without” and acute groups than the “with diagnosis” group. There are slightly more small cell cancers in the acute and “without diagnosis” groups. These differences may explain some of the variation in management and treatment between the three groups.

6.1.4. Presentation

Half the study patients presented to hospital without a provisional diagnosis of lung cancer, 26% acutely (15% via GP, 11% self presented). Guidelines for lung cancer management assume that patients with lung cancer present in a typical fashion. That is a patient’s respiratory symptoms lead to a general practitioner consultation and then a referral, usually via an abnormal radiograph, to a chest physician and a standard hospital pathway of diagnosis and management. (BTS 1998, SIGN 1998, SMAC 1994) In this study 30% of the “without diagnosis” group had no chest symptoms and 63% of the acute group were admitted to hospital with a non-chest related cause. Lack of chest symptoms is likely to make the diagnosis & appropriate referral difficult for GPs.

Awareness of the diversity of presentations of lung cancer is helpful to clinicians in considering possible diagnoses. Local guidelines on lung cancer may need to be adjusted to reflect this diversity.

6.1.5. Referral Pathways

There are a very large number of referral pathways. 70 pathways were identified in this study. Patients were referred initially to one of 18 different specialties with only 52% of all patients being referred to or admitted by a specialist in lung cancer (defined here as Chest Physicians, Cardio-Thoracic Surgeons or Oncologists). Lack of chest symptoms in some patients makes this finding unsurprising in them but 13% of those diagnosed by chest x-ray (“with diagnosis” group) were not sent to a lung cancer specialist.

Cross-referral to respiratory services should be encouraged as soon as a working diagnosis of lung cancer is made, whatever the stage or condition of the patient. This may be impracticable with patients who are moribund but it should be the general rule. The British Thoracic Society says that general practitioners and hospital doctors should immediately refer to a respiratory physician all patients whose radiography reports suggests the possible diagnosis of lung cancer. (BTS 1998) Other guidelines give similar recommendations. (SMAC 1994, SIGN 1998)

6.1.6. Specialist Care

One in 11 patients receive no specialist input at all. The national COG lung cancer guidelines state that “Arrangements should be made to facilitate rapid referral to the lung cancer team for patients who are being treated for other conditions and have, or are thought to have lung cancer.” (COG 1998) Ideally all lung cancer patients should be assessed by at least one lung cancer specialist. 78% of patients were eventually managed by a specialist and a further 13% had specialist input without transfer of care.

6.1.7. Investigation and Treatment

There are very low rates of investigation and treatment, particularly amongst patients who present atypically. The “without diagnosis” group had lower rates of bronchoscopy, mediastinoscopy and CT scans and only 48% of the acute admissions had histological confirmation of lung cancer. 57% of those who presented acutely or without a diagnosis received only supportive care.

The study provides no adequate information as to whether the low rate of investigation and treatment are appropriate. There is insufficient information on the case mix (performance status, disease stage and co-morbidity) of patients in this study to comment on the appropriateness of patient management. The lesser amounts of surgery in the “without diagnosis” and acute groups might suggest that these groups have more cases in later stages of the disease, but the “with diagnosis” group also has higher rates of palliative radiotherapy.

An alternative possibility is that investigations and treatment differed because these patients had less specialist care than the “with diagnosis” group (63% compared to 96%). There are big inter-district differences in these investigation and treatment rates and evidence from detailed analysis of hospitals within Yorkshire has shown that these low rates are particularly associated with non-specialist management (NYCRIS 1999). Other studies have shown similar findings. (Billing 1996, Fergusson 1996)

6.1.8. Referral Intervals

The study finds that referral times are mainly meeting the guidelines recommendations. An outpatient appointment within two weeks should be regarded as appropriate practice. This study indicated that the median time interval from GP referral to 1st Hospital visit was 5 days and the interval from GP Chest X Ray request to 1st Hospital Visit was 17 days which meets the SMAC recommendations. Only 48% of those with a diagnosis were treated (or a decision made not to treat) within 5 weeks compared to 68% of the “without diagnosis” group who had the treatment or decision made within 6 weeks. Decisions not to treat were generally made within 3 weeks, whereas time to treatment took about 6 weeks.

Some investigation of long intervals before first hospital visit showed that delay was deliberate. Similar reviews of case notes would be required to discover avoidable delays. Comparing a decision not to treat with actual treatment is not comparing like with like. It may be that decisions to treat were made as quickly but treatment was delayed for reasons such as lack of radiotherapy time. Nevertheless many treatments fell outside the guideline recommendations, although it should be noted that the SMAC and SIGN guidelines allow 8 weeks to commencement of treatment from first hospital appointment. (SMAC 1994, SIGN 1998) Audit of time to treatment might reveal avoidable delays. (Billing 1996)

6.1.9. Further Research

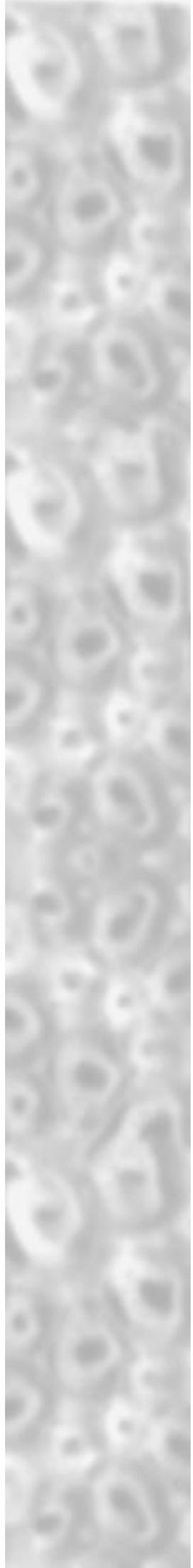
Further research is to be carried out into

- the effect of age on the investigation and treatment of lung cancer
- the factors associated with receiving radical lung cancer treatments (surgery or radiotherapy) or palliative care only, in non small cell lung cancers in histologically confirmed cases. Variation in these factors across hospitals and districts will be considered.

A study looking at the reasons for non-specialist management might be appropriate.

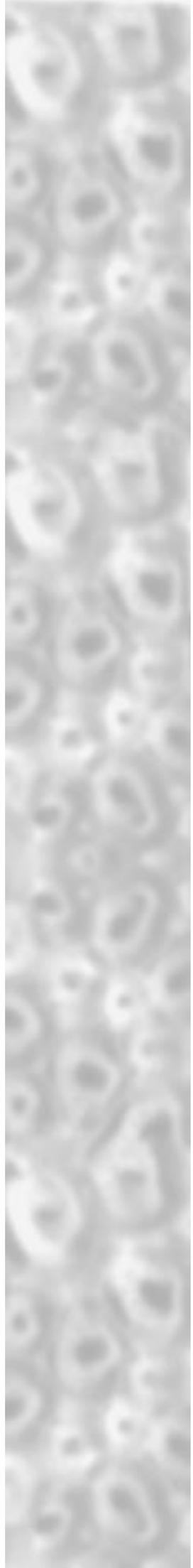
6.2. RECOMMENDATIONS

- Clinicians and commissioners should be aware of the diversity of presentations of lung cancer.
- When lung cancer is diagnosed or strongly suspected, whether in the community or in hospital, patients should be referred to the lung cancer team.
- Every effort should be made to complete the process of diagnosis, staging and development of a management plan as quickly as possible. Audit of times to treatment might allow avoidable delays to be minimised.



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8.1. NATIONAL RECOMMENDATIONS

8.1.1. National Cancer Guidance (COG, 1998)

- i. Asymptomatic people should not be offered screening for lung cancer
- ii. Each district should establish a clear documented local clinical policy which describes the pathway of care for the diagnosis and management of lung cancer. All patients who may have lung cancer, whatever their age, should be managed in accordance with documented clinical policy.
- iii. The policy should make clear what action should be taken if x-ray findings suggest a patient has a low or high suspicion of lung cancer.
- iv. There should be clear routes of access to this pathway for patients coming from any point in the health care system.
- v. Arrangements should be made to facilitate rapid referral to the lung cancer team for patients who are being treated for other conditions and have, or are thought to have, lung cancer.
- vi. Radiologists should notify the lung cancer team whenever they see a chest x-ray which shows possible lung cancer.
- vii. GP's need prompt access to good diagnostic services and reporting.
- viii. Every effort should be made to complete the process of diagnosis, staging and development of a management plan as quickly as possible.

8.1.2. Standing Medical Advisory Committee (SMAC, 1994)

- i. Most patients present to their general practitioner and prompt referral for a chest radiograph is important. A report should be available to the general practitioner within one week.
- ii. Patients with the possibility or probability of lung cancer need to be seen promptly by a specialist. An outpatient appointment within two weeks should be regarded as appropriate practice and a system of automatic referral to an appropriate clinic in cases of an abnormal x-ray can reduce delay.
- iii. Wherever possible, bronchoscopy should be done within one week of the clinic appointment and pathology results should be available within one week of this.
- iv. If preliminary investigations suggest that a patient is potentially curable by surgery they should be referred to a thoracic surgeon. No more than 6 to 8 weeks should elapse between the patient's first presentation to the general practitioner and the operation.

8.1.3. Scottish Intercollegiate Guidelines Network (SIGN, 1998)

- i. Patients presenting with signs or symptoms suggestive of lung cancer should be sent for a chest x-ray.
- ii. Open access to chest x-ray should be available to provide an examination and radiologist's report within one week of receipt of referral.
- iii. A normal chest x-ray does not exclude lung cancer and all patients with suggestive symptoms should be referred to a respiratory physician.
- iv. All patients suspected of having lung cancer should be seen by a respiratory physician within two weeks of the receipt of the referral.
- v. All patients suspected of having lung cancer should have investigations aimed at confirming the pathological diagnosis carried out within two weeks of first being seen by a respiratory physician.
- vi. Surgery should take place within four weeks of receipt of referral to the surgeon, without prejudicing the patient's preoperative assessment, and within 8 weeks of diagnosis.

8.1.4. Joint Council for Clinical Oncology (1993 & 1994)

The recommended waiting time targets are calculated from the date of the first oncology consultation to the start of radiotherapy or chemotherapy.

- **urgent radiotherapy or chemotherapy**
good practice: 24 hours
maximum acceptable: 48 hours
- **palliative radiotherapy (according to severity of symptoms)**
good practice: 48 hours
maximum acceptable: 2 weeks (for non-severe symptoms)
- **radical radiotherapy (involving complex treatment planning)**
good practice: 2 weeks
maximum acceptable: 4 weeks
- **intensive (radical) chemotherapy**
good practice: 1 week
maximum acceptable: 3 weeks

8.1.5. British Thoracic Society Recommendations to Respiratory Physicians (BTS, 1998)

- i. General practitioners and hospital doctors should immediately refer to a respiratory physician for an opinion about future investigations and management of all patients whose radiography reports or other evidence suggests the possible diagnosis of lung cancer
- ii. Patients referred by general practitioners who have obvious clinical evidence of lung cancer should be seen within one week of referral receipt in a respiratory physician's clinic.
- iii. There should be a delay of no more than two weeks between a patients having radiography, requested by the general practitioner, and being shown to have a high probability of cancer, and the patients being seen in a respiratory physician's clinic.
- iv. Respiratory physicians, radiologists and general practitioners should collaborate to organise a service with minimal delays.
- v. Inpatient referrals to respiratory physicians from other hospital consultants should be seen within two working days of receipt, and outpatient referrals within one week.
- vi. The result of bronchoscopy or any other similar diagnostic test, including histological or cytological result, should be available and communicated to the patient within two weeks of a decision to do it.
- vii. There should be a maximum of eight weeks between the first consultation with a respiratory physician, in an uncomplicated operable case, and thoracotomy.
- viii. All patients should be seen by a clinical oncologist within one week of referral receipt from the general practitioner or hospital.
- ix. Patients with small cell lung cancer should be referred either to a respiratory physician who has experience of supervising chemotherapy or to an oncologist. Patients with non-small cell lung cancer in whom chemotherapy is being considered should be referred similarly. All patients should be seen by such a specialist within one week of the referral being received.
- x. In cancer units where respiratory physicians give chemotherapy for lung cancer, patients should begin treatment within seven working days of the decision to employ a particular protocol. In other units physicians should liase with their oncology colleagues to ensure that similar arrangements are in place for their patients.

8.2. REFERRAL PATHWAYS

▼ Referral Pathways

1st Consultant	2nd Consultant	3rd Consultant	4th Consultant	n	%
Accident & Emergency	Chest Physician	-	-	2	0.6%
Accident & Emergency	Chest Physician	Medical Oncology	-	1	0.3%
Accident & Emergency	Chest Physician	Clinical Oncology	-	1	0.3%
Accident & Emergency	Medicine for the elderly	-	-	1	0.3%
Accident & Emergency	Thoracic Surgery	Clinical Oncology	-	2	0.6%
Clinical Assistant (unknown)	Chest Physician	-	-	1	0.3%
Cardiology	Chest Physician	-	-	2	0.6%
Cardiology	Medicine for the elderly	Chest Physician	-	1	0.3%
Cardiology	Clinical Oncology	-	-	2	0.6%
Cardiology	Thoracic Surgery	-	-	1	0.3%
Chest Physician	-	-	-	68	18.7%
Chest Physician	Chest Physician	Thoracic Surgery	-	1	0.3%
Chest Physician	General Medicine	-	-	1	0.3%
Chest Physician	Neurosurgery	-	-	1	0.3%
Chest Physician	Medical Oncology	-	-	3	0.8%
Chest Physician	Palliative Medicine	-	-	1	0.3%
Chest Physician	Clinical Oncology	-	-	63	17.4%
Chest Physician	Thoracic Surgery	-	-	30	8.3%
Chest Physician	Thoracic Surgery	Clinical Oncology	-	13	3.6%
Endocrinology	-	-	-	2	0.6%
Ear, Nose & Throat	Chest Physician	-	-	2	0.6%
Ear, Nose & Throat	Chest Physician	Clinical Oncology	-	1	0.3%
Ear, Nose & Throat	Medicine for the elderly	-	-	1	0.3%
Ear, Nose & Throat	Clinical Oncology	-	-	2	0.6%
Ear, Nose & Throat	Thoracic Surgery	-	-	1	0.3%
Medicine for the elderly	-	-	-	40	11.0%
Medicine for the elderly	Chest Physician	-	-	4	1.1%
Medicine for the elderly	Chest Physician	Clinical Oncology	-	2	0.6%
Medicine for the elderly	Medicine for the elderly	-	-	1	0.3%
Medicine for the elderly	Clinical Oncology	-	-	8	2.2%
Medicine for the elderly	Thoracic Surgery	-	-	2	0.6%
Medicine for the elderly	Thoracic Surgery	Clinical Oncology	-	1	0.3%
Gastroenterology	-	-	-	2	0.6%
Gastroenterology	Chest Physician	Clinical Oncology	-	1	0.3%
Gastroenterology	General Medicine	-	-	1	0.3%
Gastroenterology	Clinical Oncology	-	-	1	0.3%
Haematology	Thoracic Surgery	-	-	1	0.3%
General Medicine	-	-	-	15	4.1%
General Medicine	Chest Physician	-	-	5	1.4%
General Medicine	Chest Physician	Clinical Oncology	-	4	1.1%
General Medicine	Chest Physician	Thoracic Surgery	-	1	0.3%
General Medicine	General Medicine	-	-	2	0.6%
General Medicine	Medical Oncology	-	-	1	0.3%
General Medicine	Clinical Oncology	-	-	16	4.4%
General Medicine	Thoracic Surgery	-	-	7	1.9%
General Medicine	Thoracic Surgery	Clinical Oncology	-	2	0.6%
General Medicine	Thoracic Surgery	Thoracic Surgery	General Medicine	1	0.3%
Neurosurgery	Clinical Oncology	-	-	1	0.3%
Medical Oncology	-	-	-	1	0.3%
Medical Oncology	Chest Physician	Clinical Oncology	-	1	0.3%
Oral Surgery	Medical Oncology	-	-	1	0.3%
Orthopaedic Surgery	-	-	-	2	0.6%
Orthopaedic Surgery	Chest Physician	Clinical Oncology	-	2	0.6%
Orthopaedic Surgery	Medicine for the elderly	-	-	1	0.3%
Orthopaedic Surgery	Clinical Oncology	-	-	2	0.6%
Orthopaedic Surgery	Thoracic Surgery	Thoracic Surgery	-	1	0.3%
Rheumatology	-	-	-	1	0.3%
Surgery	-	-	-	5	1.4%
Surgery	Chest Physician	-	-	3	0.8%
Surgery	Chest Physician	Clinical Oncology	-	2	0.6%
Surgery	Chest Physician	Thoracic Surgery	-	1	0.3%
Surgery	Ear, Nose & Throat	Clinical Oncology	-	1	0.3%
Surgery	Medicine for the elderly	-	-	2	0.6%
Surgery	Medical Oncology	-	-	1	0.3%
Thoracic Surgery	-	-	-	6	1.7%
Thoracic Surgery	Medical Oncology	-	-	2	0.6%
Thoracic Surgery	Clinical Oncology	-	-	1	0.3%
Urology	Chest Physician	-	-	2	0.6%
Urology	Chest Physician	Clinical Oncology	-	1	0.3%
Urology	Medicine for the elderly	-	-	1	0.3%