SCAN
South East Scotland Cancer Network

NHS SCOTLAND

SOUTH EAST SCOTLAND CANCER NETWORK
PROSPECTIVE CANCER AUDIT

LUNG CANCER 2011

COMPARATIVE AUDIT REPORT

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SA L02/13

Working regionally to improve cancer services

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LUNG CANCER COMPARATIVE REPORT 2011
PATIENTS DIAGNOSED 01 JANUARY – 31 DECEMBER 2011

CONTENTS

INTRODUCTION AND METHODS

This report presents analysis of data collected on lung cancer patients newly diagnosed with lung cancer between 01 January and 31 December 2011 who were treated in one of the four constituent health board areas comprising South East Scotland Cancer Network (SCAN) – Borders, Dumfries & Galloway, Fife, and Lothian, and the tertiary centre in Edinburgh.

Basis of Analysis

The Report provides evidence relating to quality and outcomes of patient care, and compares performance against nationally agreed Revised Lung Cancer Standards published by NHS Quality Improvement Scotland (NHS QIS) (www.nhshealthquality.org) in March 2008. Data from Scotland is additionally incorporated into the UK-wide National Lung Cancer Audit (NLCA) (www.ic.nhs.uk/services/national-clinical-audit-support-programme-ncasp/audit-reports/lung-cancer) where performance is measured against set recommendations. Performance has been measured against eighteen NHS QIS Standards and three UK NLCA recommendations and is shown in the Summary of Performance (pp. xii – xiv) and is detailed throughout this Report.

In reviewing results, allowance should be made where small numbers and variation may be due to chance. Aggregation of results over time helps to clarify results where numbers are small. General comparison is also shown with results for 2009 and 2010 where available. It is important to demonstrate consistency and improvement of results over time. Comparing results also offers the opportunity to consider any specific points of difference and the Action Plan and comments contained within this Report will draw attention to these.

Patients included in the Report

Patients included are all patients newly-diagnosed with lung cancer from 01 January to 31 December 2011.

Datasets and Definitions

We first started collecting the nationally agreed dataset in SCAN health boards in 1999 and the process of collection and reporting has matured substantially over the years. The dataset currently collected (implemented on 1st January 2010) is the nationally agreed Lung Cancer Data Definitions for Minimum Core Data Set, revised and published in 2010 (www.isdscotland.org). The Revised Definitions were developed by ISD (Information Services Division) Scotland in collaboration with the regional cancer networks (SCAN (South East Scotland Cancer Network), NoSCAN (North of Scotland Cancer Network) and WoSCAN (West of Scotland Cancer Network)).

From 1st January 2010 we began collecting data on patients diagnosed with mesothelioma. Data for mesothelioma patients are not included in this report because due to small numbers there is a high risk of disclosure of sensitive information. It has been agreed to report using aggregated data for mesothelioma once sufficient data has been collected (3 to 5 years of data). Analyses of 2011 mesothelioma data have been carried out at local and regional levels and have been reviewed by clinical staff.

Further information on the dataset and definitions can be obtained from the SCAN Audit Office, c/o Dept of Clinical Oncology, Western General Hospital, Edinburgh. (Christine.dodds@luht.scot.nhs.uk).

Data Collection

Patients were mainly identified through registration at weekly multi-disciplinary meetings, and through checks made against pathology listings, GRO records, LCNS database download, and oncology records. Data capture was dependent on casenote audit and/or review of hospital electronic records systems. Data was recorded on Access databases in each centre.

Data Quality
All hospitals in the region participate in the Quality Assurance programme provided by ISD Scotland. Previous quality assurance examination of data (patients diagnosed in 2008) against national data definitions showed accuracy rates of 97%.

Estimate of Case Ascertainment
Case ascertainment levels are assessed by comparing the number of new cases identified by audit with those identified by Scottish Cancer Registry. Comparisons will, however, be subject to a small amount of variation. The 'year' in audit is based on the date of diagnosis whereas cancer registration defines their cohort based on the date the patient first became known to the secondary health service. Estimated Case Ascertainment is based on the most recent five year average available from Scottish Cancer Registry data and excludes death certificate only registrations.

HEALTH BOARD/HOSPITAL	CLINICIAN(S)	AUDIT SUPPORT
SCAN	**Dr C Selby** **SCAN Lead Clinician**	**Ailsa Patrizio** **SCAN Audit Facilitator**
NHS Borders		
Borders General Hospital	Dr J Faccenda	Lynn Smith (Borders)
NHS Dumfries & Galloway		
D&G Royal Infirmary	Dr P Rafferty	Martin Keith (D&G)
NHS Fife		
Queen Margaret Hospital, Dunfermline Victoria Hospital, Kirkcaldy	Dr C Selby	Mimi Bjelorgrlic (Fife)
NHS Lothian		
Western General Hospital	Dr R Fergusson	Ailsa Patrizio (Lothian)
St John's Hospital at Howden, Livingston	Dr F Boellert, Dr D Noble, Dr T McCafferty	
New Royal Infirmary of Edinburgh	Dr K Skwarski	

Report Sign-Off

Version 3 (SCAN Report Index No: SA L02/13) has been signed off by Dr Colin Selby (NHS Fife), Dr Jakki Faccenda (NHS Borders), Dr Paul Rafferty (NHS Dumfries & Galloway) and Dr Ron Fergusson (NHS Lothian) and circulated as the Final Draft to the SCAN Lung Group on 5 March 2013.

Actions for Improvement
The process following final sign-off is that the report is sent to the Clinical Governance groups within the four health boards and to the Regional Cancer Planning Group. Action plans and progress with plans is highlighted to the groups. The report is placed on the SCAN website once it has been fully signed-off and checked for any disclosive material.

COMMENT BY CHAIR OF THE SCAN LUNG GROUP

I am pleased to present my first SCAN Lung Group Comparative Audit Report on patients newly diagnosed with lung cancer between 01 January and 31 December 2011 and who were treated in the four SCAN health boards. This report confirms the quality of care, and by identifying variations in compliance to nationally agreed standards of care, enables us to use this to drive forward improvements to service and patient care.

The "traffic lights" Summary of Performance is yet again included, showing our results against both Scottish NHS QIS Standards and UK National Lung Cancer Audit (NLCA) Recommendations. This has given us a clear opportunity to consider specific points of difference and these are outlined in the report's Action Plan. This allows us to identify key areas for review and consider implementing changes where necessary:

- Although we continue to struggle to achieve the percentage of histologically diagnosed patients recommended (Standard 2a.1) we have again to recognise that there are cases when meeting standards cannot be considered a foregone conclusion or an absolute requirement for quality of care. Review of this data has again consistently shown that high case ascertainment linked with other clinical factors including co-morbidities confirm that invasive procedures are sometimes less appropriate especially when treatment management plans would not be altered.
- We will continue to review the practice and consistencies in the formalised and informal documentation of patient's access to Lung Cancer Nurse Specialists (LCNS). This is to ensure that all appropriate patients with lung cancer in SCAN are offered this service and we can robustly demonstrate it (NLCA 5).
- Review of non-small cell lung cancer histologies are underway to review and minimise the proportion that are unable to be further characterised, whether adeno- or squamous. This attempt to minimise the NOS (not otherwise specified) classification in advance of Quality Performance Indicators (QPI).

Ongoing collaboration between clinical and audit staff in reviewing data means that we can be confident in the accuracy of these results. Regular audit reporting, using standards and recommendations as markers of quality has allowed consistency and improvements over time to be initiated and demonstrated. This report therefore confirms our confidence in the quality of the service currently provided across the SCAN network for patients with lung cancer.

Scottish NHS QIS Standards for Lung Cancer will be replaced by QPIs this spring 2013. Both clinical and audit members of SCAN participated in the development of these indicators. They are outcome focussed and the main function will be to continue to ensure quality, service and patient care.

SCAN members are also contributing to the Scottish Government's Detect Cancer Early (DCE) initiative. Along with our colleagues in the other Scottish Cancer Networks we have provided baseline data and are monitoring current diagnostic rates particularly.

Outcome of treatment remains important and items are included in this report. We hosted and contributed to the National Lung Cancer Network's meeting held in Edinburgh, November 2012. Diagnostic, treatment and survival data from each of the Networks was presented and debated in this National forum. The programme also included an opportunity to consider National initiatives that included DCE and lung cancer screening.

Once again this report, its genesis and critiquing would not have been possible without all the audit facilitators working in lung cancer in South-east Scotland. I thank them for the considerable commitment and hard work which will remain of crucial national importance even as we move to a slightly different QPI data set. I would take this opportunity to formally thank Ailsa Patrizio, SCAN Cancer Audit Facilitator, whose talents have been recognised in a wider forum as she undertakes a secondment with the Scottish Government.

I would also like to take this opportunity to thank my predecessor, Dr Ron Fergusson who as the Chair of the SCAN Lung Group for many years oversaw the development and improvements in the service that have been noted in previous reports. He will be taking his well-earned retirement in the next few months.

This data is of and for the Lung Cancer Multidisciplinary Team. Thanks must therefore also go to respiratory consultants, radiology and pathology consultants, thoracic surgery consultants, the Edinburgh Cancer Centre consultant oncologists and to the Lung Cancer Nurse Specialist team. Once again their help and collaboration has resulted in this comprehensive report. This annual report now sitting beside many previous years' reports, is increasingly a wealth of accumulated data for lung cancer patients in South-East Scotland. I commend you to read this and encourage you to use it.

Dr Colin Selby
Chair, SCAN Lung Group
05/03/2013

LUNG CANCER AUDIT 2011: ACTION POINTS

Lung cancer teams in SCAN (clinicians, nurses, and audit staff) review data regularly to identify possible areas for improvement and actively participate in driving improvements and, where appropriate, make changes to the way care is delivered.

Note: NLCA = National (UK) Lung Cancer Audit (www.ic.nhs.uk);
NHSQIS = NHS Quality Improvement Scotland (www.healthcarequalityimprovementscotland.org)
SIGN = Scottish Intercollegiate Guidelines Network

Table No:	YEAR(S)	POSSIBLE AREA FOR IMPROVEMENT	PROPOSED ACTION	WHICH CLINICAL STANDARD WILL THIS MEET/ HOW WILL THIS IMPROVE PATIENT CARE	PROGRESS/ OUTCOME
Table 1	2011	Improve reliability of audit results by ensuring full coverage of D&G lung cancer population treated in NHS Scotland	D&G to investigate case ascertainment (70.9%)	Full coverage of the lung cancer population is essential to obtain reliable results from audit	Comment provided by NHS D&G: • Teething problems in Introduction of new MDT system • An unknown % (10%?)of patients are treated in NHS Cumbria though recorded by Scottish Cancer Registry – further audit of this to be undertaken
Table 4	2011 Brought forward from 2010	Documentation of access to Lung Cancer Nurse Specialists (LCNS).	Discharge Summary Review – CNS contact to be documented.	**NLCA (5)** At least 80% of patients are seen by a lung cancer specialist nurse.	Achieved overall 2011 – 80.4 %. Fife result much improved in 2011 to 79.1%. Medical staff to ensure reference to CNS is included in all correspondence including discharge summaries.
Table 5	2011 Brought forward from 2010	Improve recording of Performance Status in Dumfries & Galloway (up from 78% to 86%)	Ensure PS is recorded at MDT meetings.	NHS QIS 4a.3 Audit has a minimum of 90% cases with WHO performance status recorded at diagnosis. PS is a key parameter in the selection of treatment management.	**Outcome**: Improvements in recording procedures were implemented at MDT meetings. D&G: procedures were implemented mid-2011 and further improvements are expected in 2012.

Table No:	YEAR(S)	POSSIBLE AREA FOR IMPROVEMENT	PROPOSED ACTION	WHICH CLINICAL STANDARD WILL THIS MEET/ HOW WILL THIS IMPROVE PATIENT CARE	PROGRESS/ OUTCOME
Table 6	2011 Brought forward from 2010	Increase the percentage of patients with histological diagnoses. SCAN = 65.6% (71.4% in 2010)	Review results which fall short of standards and recommendations.	NHS QIS 2a.1 A minimum of 75% of all lung cancer patients have their diagnosis confirmed by histology/cytology. NLCA: Histological/Cytological confirmation rates below 75 per cent should be reviewed to determine whether best practice is being followed and whether patients have access to the whole range of biopsy techniques.	**Outcome**: Data on patients not having histological diagnosis in Lothian has been reviewed. This showed that high case ascertainment linked with advanced stage at presentation, age and other co-morbidities meant that invasive procedures were sometimes less appropriate especially when treatment management would not be altered.
Table 10.1	2011 Brought forward from 2010	TNM Stage recorded as 'near miss' (86%) in Dumfries & Galloway – improve recording process.	Ensure TNM staging is recorded at MDT meetings.	NHS QIS 4a.2 Staging is a key parameter in the selection of treatment management.	**Outcome**: Improvements in recording procedures were implemented at MDT meetings. D&G: procedures were implemented mid-2011 and further improvements are expected in 2012.
Table 11	2011	Increase anti-cancer treatment rates, especially in Fife (53.6%).	Multivariate analysis to be undertaken (age, sex, stage, deprivation, comorbidities and pathology).	NLCA (8). Active anti-cancer treatment rates below the England and Wales average of 60% should be reviewed. To increase the chance of cure and long-term survival.	Awaiting completion of multivariate analysis.

Table No:	YEAR(S)	POSSIBLE AREA FOR IMPROVEMENT	PROPOSED ACTION	WHICH CLINICAL STANDARD WILL THIS MEET/ HOW WILL THIS IMPROVE PATIENT CARE	PROGRESS/ OUTCOME
Table 13.1	2010	Increase the percentage of early stage lung cancer patients having surgical resection.	Ensure all MDT meetings include input from surgeons. Analysis of treatment management of patients with stage I & II disease. Implement measures to ensure full review especially of early stage and borderline operability patients.	NLCA Performance Measure: an acceptable resection rate is set at 10%. To maintain good resection rates and to increase patients' survival rates – surgery represents the main chance of cure and long-term survival.	**Outcome**: Prospective audit of Stage I & II patients undertaken and reasons why no active treatment was given identified. **Outcome**: Implementation of full and detailed discussions of early stage patients including and especially those those of borderline operability at MDTs. Decisions are recorded in Minutes. Outcome: Surgical input in all boards except Borders confirmed.
Table 13.1	2011	Maintain attention to increasing the percentage of early stage lung cancer patients having resection.	As above, ensure detailed discussions of patients of borderline operability by the MDT and the reasons why surgery is not the choice of treatment should be recorded.	NLCA (7): new recommendation introduced in UK NLCA Report 2011: "For early stage (I and II) disease, [surgical] rates below 52% should be reviewed".	2011 results similar to 2010 in showing that overall 64% of patients with early stage (I and ii) disease have radical treatment, of whom 37% have resection.
Table 13.2	2011	Increase the number of NSCLC Stage III patients receiving radical treatment. (37.8% in 2011)	Review 2011 data for NSCLC Stage III patients.	No standard but radical treatment offers more patients the chance of cure.	Use audit of NSCLC Stage III patients to assess reasons why patients do not have radical therapy and then consider enhancing MDM measures to ensure full discussion and recording of decisions.

Table No:	YEAR(S)	POSSIBLE AREA FOR IMPROVEMENT	PROPOSED ACTION	WHICH CLINICAL STANDARD WILL THIS MEET/ HOW WILL THIS IMPROVE PATIENT CARE	PROGRESS/ OUTCOME
Table 16.1	2011 Brought forward from 2010	Percentage of surgical patients receiving wedge or segmentectomy.	Review reasons why fairly high percentage of surgical patients have received wedge or segmentectomy in Dumfries and Galloway.	**NHS QIS Standard 5b.4** Less than 10% of patients that undergo surgery are resected by wedge or segmentectomy.	**Outcome**: Review of the data has shown that allowance should be made where small numbers and variation may be due to chance. Aggregated results better illustrate performance. Across the region the percentage for 2011 is 10.1%.
Table 20	2011	Improve methods of reporting radiotherapy treatment data to peripheral Boards: • Problem noted in D&G by audit manager • Some deficiencies in Fife RT data identified at late stage in preparation of 2011 Comparative Report.	Raise concerns with ECC management about ensuring timely flow of oncology treatment data to and from peripheral boards	No clinical standard but lack of information in peripheral hospitals about treatment received by patients at ECC impedes clinical management and audit data capture with possible consequence in patient care and reduction in reliability of audit results	Action to be initiated
Table 20.1	2011 Brought forward from 2010	Radiotherapy by curative potential	Review results which fall short of standards and recommendations.	**NHS QIS Standard 5c.4** A minimum of 10% NSCLC patients receive radical radiotherapy dose. **NHS QIS Standard 5c.8** A minimum of 35% NSCLC patients receive palliative radiotherapy.	**Outcome**: Although results show a lower than recommended rate of palliative radiotherapy for NSCLC (23.3% in SCAN) this is because of a higher than average use of radical radiotherapy in all boards- results for this indicate the standard very well met. (17.3% across SCAN). This offers more patients the chance of cure.

DOCUMENT HISTORY

Version	Circulation	Date	Comments
Version 1	SCAN Lung Group	07/11/2012	Draft report circulated to clinicians: Sub-group meeting 13 November 2012: discussion and analysis of results.
Version 2	SCAN Lung Group		Commentary from sub-group meeting added to report. Various results checked and clarified by clinical staff and any necessary amendments have been carried out.
Version 3	SCAN Lung Group	05/03/2013	
Version 4 Final SCAN Report Index No. SA L02/13	Clinical Governance Groups, Lead Managers and Chairs in the four health boards and to the SCAN Regional Cancer Planning Group.		
		June 2013	Report assessed for disclosive material and published on SCAN website.

NHS QIS STANDARDS FOR LUNG CANCER AND NLCA RECOMMENDATIONS

The Revised NHS QIS (Quality Improvement Scotland) Clinical Standards for Lung Cancer (New Edition) were published in July 2008 to inform the management of, and continuously improve, lung cancer services. SCAN currently reports on 18 NHS QIS Standards. These are used as a benchmark from which to measure performance.

2a.1	A minimum of 75% of all lung cancer patients have their diagnosis confirmed by histology/cytology.
4a.2	Audit has a minimum of 90% cases with TNM stage recorded at diagnosis.
4a.3	Audit has a minimum of 90% cases with WHO performance status recorded at diagnosis.
5a.3	The percentage of all patients diagnosed with lung cancer receiving surgery, radiotherapy, chemotherapy and combined modality treatment is recorded.
5a.4	The percentage of patients receiving treatment with curative intent is recorded.
5b.4	Less than 10% of patients that undergo surgery are resected by wedge or segmentectomy.
5b.9	The 30-day mortality rate following final lung cancer surgery specific to the procedure performed is recorded and discussed at team meetings.
5c.2	Patients with completely resected N0/N1 tumours do not receive postoperative radiotherapy (PORT).
5c.3	The percentage of patients with incomplete resection receiving postoperative radiotherapy is recorded.
5c.4	A minimum of 10% NSCLC patients receive radical radiotherapy dose.
5c.5	A minimum of 60% of those limited (LD) SCLC patients receiving chemotherapy also receive consolidation radiotherapy to the chest.
5c.6	The percentage of SCLC patients treated with concurrent chemoradiotherapy are recorded.
5c.7	A minimum of 60% of those LD SCLC patients receiving chemotherapy subsequently receive prophylactic cranial irradiation (PCI).
5c.8	A minimum of 35% NSCLC patients receive palliative radiotherapy.
5c.13	The 30-day mortality rate following final radiotherapy with curative intent is recorded and analysed.
5d.1	A minimum of 60% of SCLC patients receive chemotherapy.
5d.2	A minimum of 20% of NSCLC patients receive chemotherapy.
5d.6	The 30-day mortality rate following final chemotherapy treatment is recorded and analysed.

The three Scottish networks (SCAN, NoSCAN and WoSCAN) also contribute data to the National Lung Cancer Audit (NLCA) Report annually. The NLCA sets recommendations for England and Wales and, in addition to NHS QIS Standards, this report measures performance in SCAN against three of these recommendations:

NLCA (5)	At least 80% of patients are seen by a lung cancer specialist nurse.
NLCA (7)	For early stage (I and II) disease, [surgical] rates below 52% should be reviewed to ensure that patients on the margins of operability/resectability are being offered access to specialist thoracic surgical expertise.
NLCA (8)	Active anti-cancer treatment rates below the England and Wales average of 60% should be reviewed.

Quality Performance Indicators (QPIs) are due to replace NHS QIS Standards as a measurement of performance and it is anticipated that they will be introduced towards the end of 2011.

Summary of Performance: NHS QIS Standards and NLCA Recommendations

Levels of performance are indicated by a colour coded 'traffic light' system. Green confirms that a Standard has been achieved, amber indicates a 'near miss', quantified as missing the target by up to 10%. Standards which are missed by more than 10% are shown as red. Some Standards are not defined as 'measureable' but are service driven, i.e. are recorded. These are shown as non-numerical (or blank) 'green' cells when met.

Summary of Performance: NHS QIS Standards

		Percentage Achievement									
		2a.1	**4a.2**	**4a.3**	**5a.3**	**5a.4**	**5b.4**	**5b.9**	**5d.1**	**5d.2**	**5d.6**
Borders	2011	73.9	100.0	100.0			15.4		53.3	30.0	
	2010	70.8%	98.9	98.9			9.1		45.5	26.9	
	2009	67.1%	100.0	100.0			-		66.7	41.0	
D&G	2011	80.0	86.0	86.0			25.0		81.8	26.1	
	2010	88.8	84.1	78.5			21.4		76.5	25.6	
	2009	79.3	85.6	96.3			-		76.2	31.3	
Fife	2011	61.6	97.6	86.2			0.0		60.4	28.1	
	2010	66.5	93.1	86.2			8.0		62.2	28.8	
	2009	70.8	93.1	95.6			-		66.7	24.1	
Lothian	2011	64.2	99.9	99.1			10.4		58.7	24.5	
	2010	70.7	98.8	98.6			3.9		61.3	24.7	
	2009	70.8	99.2	94.9			7.1		67.7	26.0	
SCAN	**2011**	**65.6**	**97.6**	**94.9**			**10.1**		**60.4**	**25.9**	
	2010	**71.4**	**96.0**	**93.6**			**7.1**		**62.1**	**25.9**	
	2009	**71.4**	**96.0**	**95.5**			**4.4**		**68.5**	**26.9**	

2a.1 A minimum of 75% of all lung cancer patients have their diagnosis confirmed by histology/cytology.
4a.2 Audit has a minimum of 90% cases with TNM stage recorded at diagnosis.
4a.3 Audit has a minimum of 90% cases with WHO performance status recorded at diagnosis.
5a.3 The percentage of all patients diagnosed with lung cancer receiving surgery, radiotherapy, chemotherapy and combined modality treatment is recorded.
5a.4 The percentage of patients receiving treatment with curative intent is recorded.
5b.4 Less than 10% of patients that undergo surgery are resected by wedge or segmentectomy.
5b.9 The 30-day mortality rate following final lung cancer surgery specific to the procedure performed is recorded and discussed at team meetings: **A study has been carried out and will be reported independently of this report.**
5d.1 A minimum of 60% of SCLC patients receive chemotherapy.
5d.2 A minimum of 20% of NSCLC patients receive chemotherapy.
5d.6 The 30-day mortality rate following final chemotherapy treatment is recorded and analysed: **A study has been carried out and will be reported independently of this report.**

Summary of Performance: NHS QIS Standards

		Percentage Achievement								
		5c.2	**5c.3**	**5c.4**	**5c.8**	**5c.4 + 5c.8***	**5c.5**	**5c.6**	**5c.7**	**5c.13**
Borders	2011	-		20.0	16.0	36.0	75.0		50.0	
	2010	-		19.2	32.7	51.9	100.0		100.0	
	2009	8.3		25.6	20.5	46.1	80.0		60.0	
D&G	2011	-		15.9	31.9	47.8	16.7		50.0	
	2010	-		14.1	33.3	47.4	100.0		33.3	
	2009	-		35.8	35.8	68.6	100.0		60.0	
Fife	2011	3.7		14.8	18.5	33.3	~~50.0~~ 92.9		64.3	
	2010	-		23.3	24.0	47.3	62.5		37.5	
	2009	3.8		18.2	28.9	47.1	81.8		54.5	
Lothian	2011	-		18.1	24.5	42.6	87.0		69.6	
	2010	-		18.0	28.4	46.4	81.8		68.1	
	2009	1.6		18.3	29.7	48.0	57.6		42.4	
SCAN	**2011**	**0.8**		**17.3**	**23.3**	**40.6**	**~~66.0~~ 78.7**		**63.8**	
	2010	**-**		**18.8**	**28.3**	**47.1**	**81.1**		**62.2**	
	2009	**2.8**		**20.4**	**29.1**	**49.6**	**68.5**		**48.1**	

5c.2 Patients with completely resected N0/N1 tumours do not receive postoperative radiotherapy (PORT).
5c.3 The percentage of patients with incomplete resection receiving postoperative radiotherapy is recorded.
5c.4 A minimum of 10% NSCLC patients receive radical radiotherapy dose.
5c.5 A minimum of 60% of those limited (LD) SCLC patients receiving chemotherapy also receive consolidation radiotherapy to the chest.
5c.6 The percentage of SCLC patients treated with concurrent chemoradiotherapy are recorded.
5c.7 A minimum of 60% of those LD SCLC patients receiving chemotherapy subsequently receive prophylactic cranial irradiation (PCI).
5c.8 A minimum of 35% NSCLC patients receive palliative radiotherapy.
5c.13 The 30-day mortality rate following final radiotherapy with curative intent is recorded and analysed: **A study has been carried out and will be reported independently of this report**.
Note: Cells marked "n/a" represent any years where data was not collected for specific Standards.

*** NHS QIS Standard 5c.4 aggregated with 5c.8 gives the recommended radiotherapy delivery (radical AND palliative) for all NSCLC patients. 45% of NSCLC patients should therefore receive radiotherapy (10% radical, 35% palliative). All health boards and SCAN are achieving this target. The rate of palliative radiotherapy (5c.8) is lower than the NHS QIS guidelines but it should be noted that this is as a consequence of the higher usage of radical radiotherapy (5c.4) which offers more patients the chance of cure.**

Summary of Performance: NLCA Recommendations

		Percentage Achievement		
		NLCA (5)	**NLCA (7)**	**NLCA (8)**
Borders	2011	94.3	47.6	64.8
	2010	96.6	52.4	66.3
	2009	n/a	43.5	73.7
D&G	2011	82.0	76.9	63.0
	2010	86.0	76.5	69.2
	2009	n/a	31.8	70.3
Fife	2011	79.1	37.5	53.5
	2010	59.3	35.9	52.7
	2009	n/a	51.9	49.8
Lothian	2011	78.9	34.6	56.3
	2010	86.5	38.5	60.2
	2009	n/a	44.3	62.3
SCAN	**2011**	**80.4**	**38.1**	**56.8**
	2010	**80.6**	**42.2**	**59.7**
	2009	**n/a**	**44.7**	**60.4**

NLCA (5) At least 80% of patients are seen by a lung cancer specialist nurse.
NLCA (7) For early stage (I and II) disease, [surgical] rates below 52% should be reviewed to ensure that patients on the margins of operability/resectability are being offered access to specialist thoracic surgical expertise.
NLCA (8) Active anti-cancer treatment rates below the England and Wales average of 60% should be reviewed.

GENERAL INFORMATION

Demographics

Case ascertainment is estimated using the average of the most recent available five years (2006-2010) of Cancer Registry Data. In the most recent period an average of 1272 patients were diagnosed annually with lung cancer (ICD-codes: C33, C34) in the SCAN region.

Table 1: Estimated Case Ascertainment

Health Board	Cancer Registry Average	2011 n	2011 %	2010 n	2010 %	2009 n	2009 %
Borders	94	88	93.6	89	100.0	76	88.4
D&G	141	100	70.9	107	74.8	111	77.6
Fife	310	297	95.8	275	89.0	319	103.2
Lothian	727	702	96.6	646	90.6	664	90.6
SCAN	**1272**	**1187**	**93.3**	1117	89.0	1170	93.3

Source: Scottish Cancer Registry, ISD. Data extracted 28 June 2012.

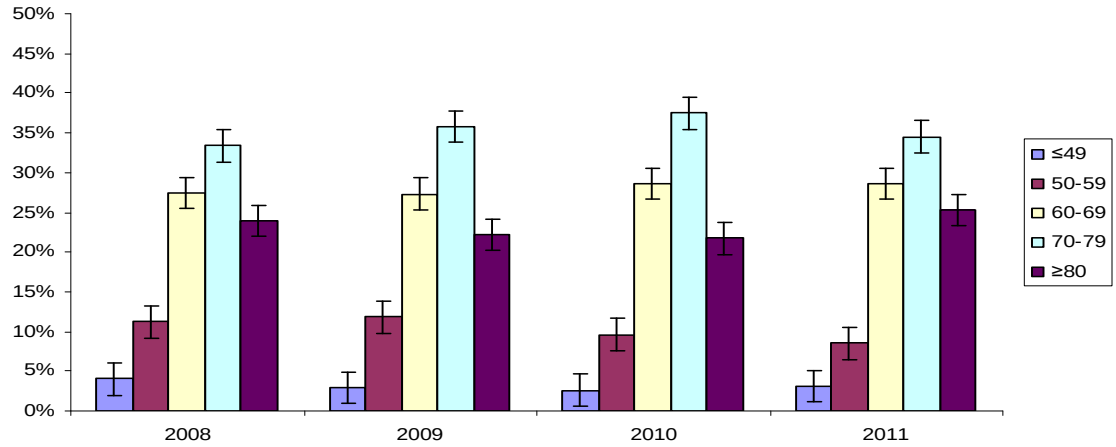
Comment from NHS Dumfries & Galloway on low case ascertainment

NHS Dumfries and Galloway made major changes to the administration of MDTs in 2011. Some initial problems with registering patients may have led to a small number of patients not being included in audit. In addition a number of patients resident in Dumfries and Galloway have been treated across the English border by NHS North Cumbria University Hospital Trust. These patients are included in cancer registration figures for NHS Dumfries and Galloway but have had no contact with NHS Dumfries and Galloway and are therefore excluded from audit. The exact numbers are unknown but between 01/10/2012 and 31/10/2012 approximately 10% of recorded deaths from lung cancer for residents of Dumfries and Galloway were unknown to NHS Dumfries and Galloway. When resources allow additional audit work will be undertaken to investigate this issue further.

Table 2: Frequencies of Age at Diagnosis of Lung Cancer
n=all patients diagnosed with lung cancer in **2011**

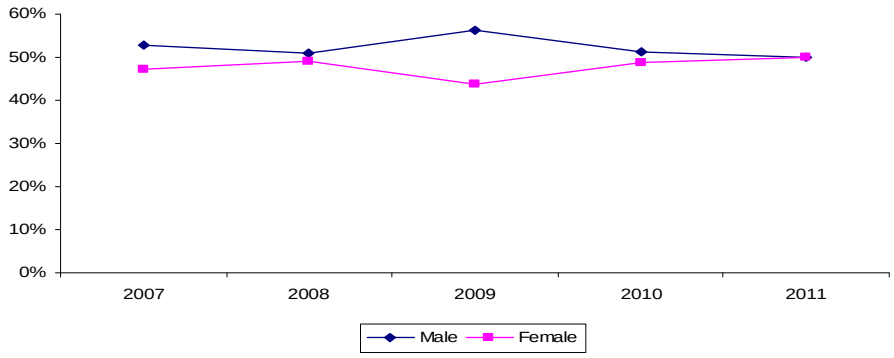
	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
≤49	1	1.1	2	2.0	7	2.4	27	3.8	37	3.1
50-59	6	6.8	6	6.0	26	8.7	63	9.0	101	8.5
60-69	23	26.1	33	33.0	90	30.3	193	27.5	339	28.6
70-79	30	34.1	40	40.0	103	34.7	237	33.8	410	34.5
≥80	28	31.8	19	19.0	71	23.9	182	25.9	300	25.3
Total	**88**		**100**		**297**		**702**		**1187**	
Range	48-92		42-92		39-96		37-96		37-96	
Median	75		72		72		72		73	

Fig (i): Distribution of Age at Diagnosis of Lung Cancer in SCAN 2008 – 2011



Error bars are used to indicate standard deviation and therefore represent variability between years rather than consistency of trend.

Fig (ii): Sex Distribution in SCAN 2007 - 2011



The ratio of male to female patients diagnosed with lung cancer in SCAN is shown in Fig 2, with comparisons over a five year period. Research by Macmillan indicates that projected rates for women with lung cancer will quadruple within the next 30 years while lung cancer rates for men are expected to rise by 8%.[1] The difference reflects different smoking rates between the sexes in the past and the later 'peak' in smoking amongst women.

[1] Macmillan Cancer Support: http://www.macmillan.org.uk/Home.aspx

Multi-Disciplinary Approach

Table 3: Patients Presented to Multi-Disciplinary Team Meeting
n=all patients diagnosed with lung cancer in **2009**, **2010** and **2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
	Presented at MDT Meeting									
2011	**87**	**98.9**	**94**	**94.0**	**297**	**100.0**	**684**	**97.4**	**1162**	**97.9**
2010	86	96.6	107	100	264	96.0	630	97.5	1087	97.3
2009	76	100	108	97.3	291	91.2	647	97.4	1122	95.9
	Not presented at MDT Meeting									
2011	1	1.1	6	6.0	-	-	18	2.6	25	2.1
2010	3	3.4	-	-	11	4.0	16	2.5	30	2.7
2009	-	-	3	2.7	28	8.8	17	2.6	48	4.1

Review of the data shows that the majority of patients who are not presented at MDM are usually older and frailer and often present via other specialties. Treatment options are often limited to supportive care due to age, co-morbidities and the advanced stage of cancer at presentation. Specific treatment management would, in all probabilities, not be altered by presentation at MDT meetings.

Table 4: Patient contact with Lung CNS (Lung Cancer Nurse Specialist)
n=all patients diagnosed with lung cancer in **2010 and 2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
	CNS Contact									
2011	**83**	**94.3**	**82**	**82.0**	**235**	**79.1**	**554**	**78.9**	**954**	**80.4**
2010	86	96.6	92	86.0	163	59.3	559	86.5	900	80.6
	No CNS contact/not recorded									
2011	5	5.7	18	18.0	62	20.9	148	21.1	233	19.6
2010	3	3.4	15	14.0	86	31.3	85	13.2	189	16.9

This is the second year we have reported on patient contact with LCNS. Of those who have no contact with an LCNS, some will be directly referred to palliative care and will be seen by a Palliative CNS.

NLCA (5)
At least 80% of patients are seen by a lung cancer specialist nurse.

There is no Scottish Standard but performance can be compared with UK NLCA recommendation of 80% (for England and Wales). While results overall achieve the recommended level, a below average performance has been noted in some boards. Significant improvement is evidenced in Fife, LCNS contact rising from 59.3% to 79.1% in 2011. Access to LCNS, including documentation was reviewed in the Action Plan 2010 and discharge summaries were identified as missed opportunities for recording CNS participation.

ACTION PLAN: Discharge summaries review to include regular and consistent documentation of LCNS contact.

DIAGNOSIS AND STAGING

Performance Status

Performance Status (PS), in conjunction with staging, is a key parameter for the selection of optimal management.

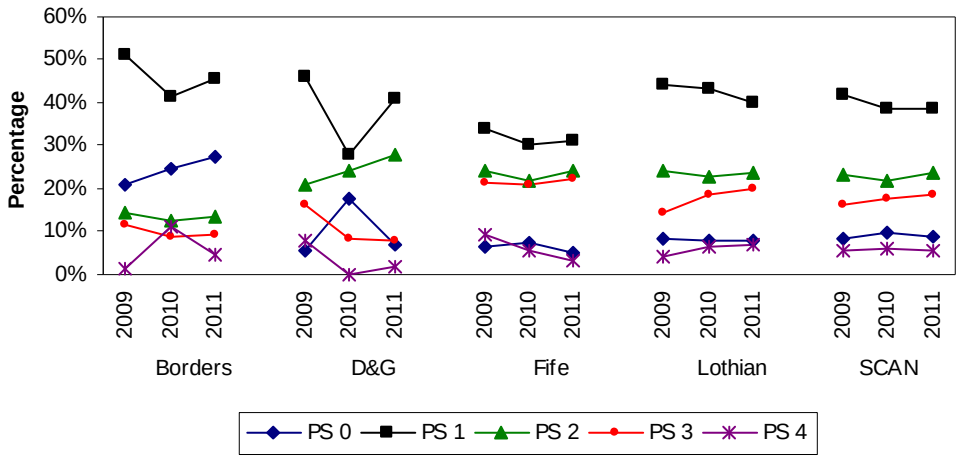
Table 5: Performance Status and Recording Completeness 2009 – 2011
n=all patients diagnosed with lung cancer in **2009, 2010** and **2011**

		Percentage PS Distribution & Overall Recording Completeness						
		PS 0 %	PS 1 %	PS 2 %	PS 3 %	PS 4 %	Not Recorded %	Recording Completeness %
Borders	2011	27.3	45.5	13.6	9.1	4.5	-	**100.0**
	2010	24.7	41.6	12.4	9.0	11.2	1.1	**98.9**
	2009	21.1	51.3	14.5	11.8	1.3	-	**100.0**
D&G	2011	7.0	41.0	28.0	8.0	2.0	14.0	**86.0**
	2010	17.8	28.0	24.3	8.4	-	21.5	**78.5**
	2009	5.4	45.9	20.7	16.2	8.1	3.7	**96.3**
Fife	2011	5.1	31.3	24.2	22.2	3.4	13.8	**86.2**
	2010	7.6	30.2	21.8	21.1	5.5	13.8	**86.2**
	2009	6.6	33.9	24.1	21.6	9.4	4.4	**95.6**
Lothian	2011	8.1	40.2	23.9	19.8	7.1	0.9	**99.1**
	2010	7.7	43.2	22.6	18.7	6.3	1.5	**98.5**
	2009	8.3	44.0	24.2	14.2	4.2	5.1	**94.9**
SCAN	2011	8.7	38.4	23.6	18.6	5.6	5.1	**94.9**
	2010	10.0	38.4	21.8	17.5	5.9	6.4	**93.6**
	2009	8.4	41.9	23.2	16.2	5.8	4.5	**95.5**

NHS QIS Standard 4a.3
Audit has a minimum of 90% cases with WHO performance status recorded at diagnosis.

While the slightly low rate in D&G demonstrates progression from the previous year, it also reflects the delayed implementation date (midway through 2011) of improved recording procedures at MDT meetings. It is anticipated that the target will be achieved in D&G in 2012. Further improvements are being implemented in Fife.

Fig (iii): Performance Status: Distribution by Health Board and SCAN 2009 to 2011



Mode of Diagnosis

Most Valid Basis of Diagnosis

The Revised Lung Cancer Dataset implemented on 1st January 2010 defines most valid basis of diagnosis as the best evidence in support of the diagnosis of cancer. Histological confirmation is considered as the most valid basis of diagnosis"[2]

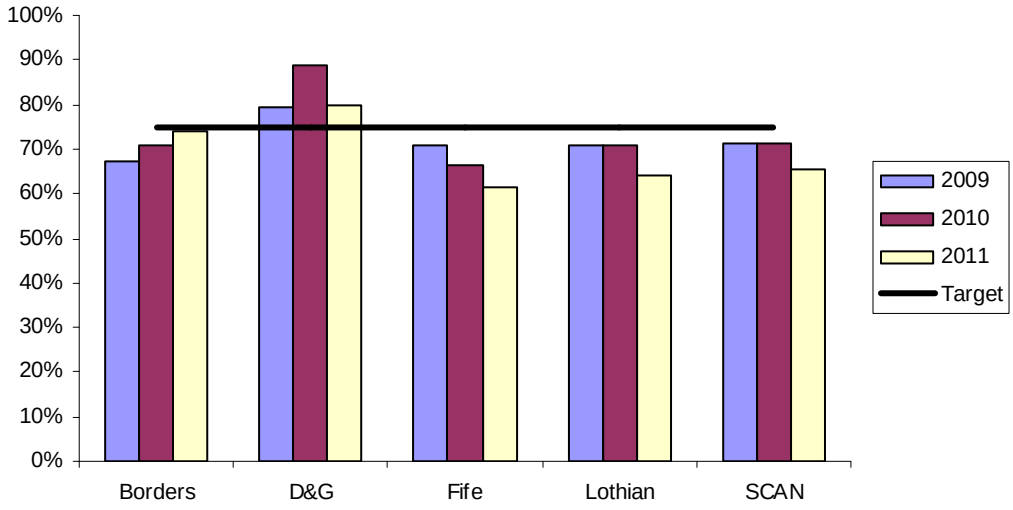
Table 6: Mode of Diagnosis – Most Valid Basis of Diagnosis
n=all patients diagnosed with lung cancer in **2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Histology	54	61.4	63	63.0	157	52.9	322	45.9	596	50.2
Cytology	11	12.5	17	17.0	26	8.7	129	18.4	183	15.4
Pathology	**65**	**73.9**	**80**	**80.0**	**183**	**61.6**	**451**	**64.3**	**779**	**65.6**
Imaging	23	26.1	20	20.0	114	38.4	251	35.7	408	34.4
Total	**88**		**100**		**297**		**702**		**1187**	

NHS QIS Standard 2a.1
A minimum of 75% of all lung cancer patients have their diagnosis confirmed by histology/cytology.

The rate of pathological (histology or cytology) diagnosis, an important marker of good quality service, continues to run at a lowish rate ('near miss' of Standard) with considerable variability seen between geographical areas and within each reporting time frame. Variation across years is to be expected but, additionally, the interpretation of data is dependent upon complex variables including how advanced a patient's disease is at diagnosis and factors such as age and the presence of other illnesses. This has an impact on rates of invasive investigations and where biopsy or FNA[3] (histological diagnosis) is not appropriate, an imaging diagnosis is recorded.

Fig (iv): Pathological Diagnosis: Distribution by Health Board & SCAN 2009 – 2011



[2] ISD Scotland: *Lung Cancer National Data Definitions for Minimum Core Dataset: Version 2.1, Oct 2010* (p37)
[3] FNA: Fine Needle Aspiration

Table 7: Type of Investigation leading to Pathological Diagnosis of Lung Cancer: Comparative Table 2009 - 2011

n=all patients diagnosed (by pathology) with lung cancer in **2009**, **2010** and **2011**

	Borders		**D&G**		**Fife**		**Lothian**		**SCAN**	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
	Bronchoscopy									
2011	21	32.3	41	51.3	78	42.6	94	20.8	234	30.0
2010	16	25.4	42	44.2	88	48.1	101	22.1	247	31.0
2009	14	27.5	52	59.1	107	47.3	98	20.9	271	32.5
	CT Guided Lung FNA/Biopsy									
2011	26	40.0	21	26.3	51	27.9	119	26.4	217	27.9
2010	24	38.1	26	27.4	41	22.4	125	27.4	216	27.1
2009	23	45.1	25	28.4	58	25.7	128	27.2	234	28.0
	EBUS									
2011	7	10.8	4	5.0	6	3.3	54	12.0	71	9.1
2010	3	4.8	4	4.2	-	-	73	16.0	80	10.0
2009	4	7.8	5	5.7	3	1.3	90	19.1	102	12.2
	Other Biopsy[4]									
2011	11	16.9	14	17.5	48	26.2	184	40.8	257	33.0
2010	20	31.7	23	24.2	54	29.5	158	34.6	255	31.9
2009	10	19.6	6	6.8	58	25.7	154	32.8	228	27.3

It should be noted that the choice of investigation carried out often reflects local expertise and available services and that all investigations used are acceptable in clinical practice.

Table 8: Frequency of PET scans in radically treated NSCLC patients

n=all patients diagnosed with NSCLC and treated radically (surgery or radiotherapy >50 Gy) in **2009**, **2010** and **2011**

	Borders		**D&G**		**Fife**		**Lothian**		**SCAN**	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
PET scan performed expressed as a percentage of all radically treated NSCLC patients in each year.										
2011	**19**	**86.4**	**22**	**91.7**	**45**	**95.7**	**131**	**94.9**	**217**	**93.9**
2010	17	85.0	24	100.0	50	90.0	128	92.8	219	92.4
2009	17	89.5	32	100.0	63	96.9	142	93.4	254	94.8

PET scanning is important in the management of lung cancer patients. It is appropriate in the investigation of a solitary pulmonary nodule to determine malignant potential and, is essential in the assessment of occult metastases in patients being considered for radical treatment.

[4] 'Other Biopsy' includes thoracic surgical procedure (frozen section) and in addition, 'other biopsy' includes biopsies from liver, skin, bone, pleura, supraclavicular node, lymph node, neck node, breast, thyroid, brain metastasis and, sputum cytology.

Pathology Type

Table 9: Pathology Type: All Patients
n=all patients diagnosed with lung cancer in **2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
Squamous	13	14.8	35	35.0	57	19.2	142	20.2	247	20.8
Adenocarcinoma	26	29.5	27	27.0	47	15.8	172	24.5	272	22.9
NSCLC (NOS)[5]	9	10.2	6	6.0	24	8.1	38	5.4	77	6.5
Other specific NSCLC	2	2.3	-	-	1	0.3	10	1.4	13	1.1
SCLC	15	17.0	11	11.0	48	16.2	75	10.7	149	12.6
Carcinoid	-	-	-	-	2	0.7	6	0.8	8	0.7
Combination of non-small cell components	-	-	1	1.0	1	0.3	2	0.3	4	0.3
Other Malignancy	-	-	-	-	3	1.0	6	0.8	9	0.8
Negative Pathology	1	1.1	10	10.0	19	6.4	75	10.7	105	8.8
No Pathology	22	25.0	10	10.0	95	32.0	176	25.1	303	25.5
Total	**88**		**100**		**297**		**702**		**1187**	

Pathological diagnoses are based on microscopic examination of the specimen by a pathologist to determine the presence of malignancy and the WHO classification of the malignant tumour.

To maintain consistency and accuracy in data collection, the Lung Cancer National Definitions for Minimum Core Data Set sets out specific guidelines for consistent coding of pathology across Scotland. There were some minor changes to coding allocation in the revised Definitions (implemented 1st January 2010) but categories remain broadly the same.

See footnote about inclusions in "NSCLC (NOS)" and "Other Specific NSCLC".

Table 9.1: Pathology Type: Comparative Table 2009 - 2011
n=all patients diagnosed with lung cancer in **2009**, **2010** and **2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
NSCLC										
2011	**50**	**56.8**	**69**	**69.0**	**135**	**45.5**	**376**	**53.6**	**630**	**53.1**
2010	52	58.4	78	72.9	146	53.1	377	58.4	653	58.5
2009	39	51.3	67	60.4	187	58.6	377	56.8	670	57.3
SCLC										
2011	**15**	**17.0**	**11**	**11.0**	**48**	**16.2**	**75**	**10.7**	**149**	**12.5**
2010	11	12.4	17	15.9	37	13.5	80	12.4	145	13.0
2009	12	15.8	21	18.9	39	12.2	93	14.0	165	14.1
No & Negative Pathology										
2011	**23**	**26.1**	**20**	**20.0**	**114**	**38.4**	**251**	**35.7**	**408**	**34.4**
2010	26	29.2	12	11.2	92	33.5	189	29.3	319	28.6
2009	25	32.9	23	20.7	93	29.2	194	29.2	335	28.6

[5] NSCLC [NOS]: Non-small cell lung cancer [not otherwise specified]. In National Data Definitions this includes large cell carcinoma and undifferentiated, pleomorphic, sarcomatoid or anaplastic carcinoma and spindle cell. OTHER SPECIFIC NSC CARCINOMAS includes salivary-type carcinomas and large cell neuroendocrine carcinomas

Staging

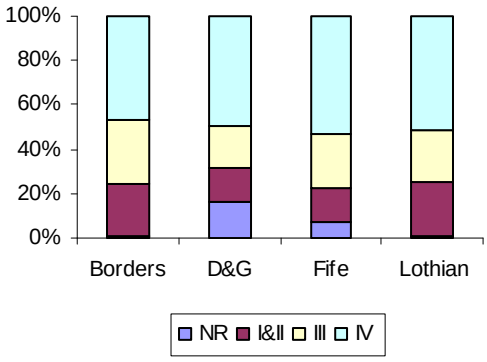
Stage is calculated using TNM (Tumour Nodal Metastases) classifications (see Appendices 3 and 4). Prior to 1st January 2010 SCLC was recorded as either limited (LD) or extensive (ED) disease. This report shows the revised TNM classification for SCLC and also uses the former limited and extensive categories, where appropriate. These categories are used as the basis for treatment management.

Table 10: Staging: All Patients
n=all patients diagnosed with lung cancer in **2011**

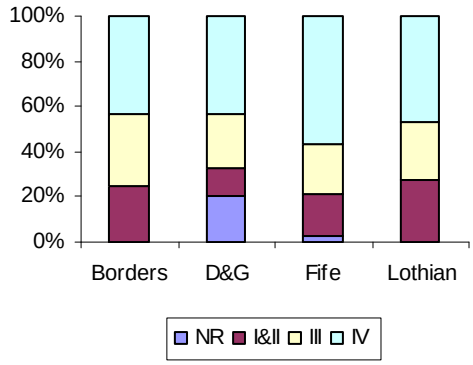
	Borders		D&G		Fife		Lothian		SCAN	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
IA	9	10.2	7	7.0	19	6.4	90	12.8	125	10.5
IB	4	4.5	4	4.0	15	5.0	38	5.4	61	5.1
IIA	3	3.4	1	1.0	12	4.0	28	4.0	44	3.7
IIB	6	6.8	1	1.0	11	3.7	37	5.3	55	4.6
IIIA	20	22.7	17	17.0	45	15.2	107	15.2	189	15.9
IIIB	8	9.1	7	7.0	21	7.1	73	10.4	109	9.2
IV	38	43.2	43	43.0	167	56.2	328	46.7	576	48.5
LD	-	-	6	6.0	-	-	-	-	6	0.5
NR	-	-	14	14.0	7	2.4	1	0.1	22	1.9
Total	**88**		**100**		**297**		**702**		**1187**	

Fig (v): Stage Distribution by Health Board 2010 and 2011 (all patients)

(a): Stage Distribution 2010



(b): Stage Distribution 2011



Staging (in conjunction with Performance Status) is a key parameter in the selection of optimal treatment management of patients with lung cancer. Differences in stage distribution between health board areas over the last two years can be seen in Figure (v). Around half of those who present with lung cancer in SCAN are stage IV compared to 10-15% of stage I lung cancer.

The Scottish Government in collaboration with the three Cancer Networks in Scotland are currently working towards improving the percentage of early stage lung cancer diagnosis as part of the Detect Cancer Early Programme. The earlier that cancer is diagnosed and treated, the better survival outcomes.

Table 10.1: Stage Recording Completeness
n=all patients diagnosed with lung cancer in **2009, 2010** and **2011**

Stage Completeness	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
2011	**88**	**100.0**	**86**	**86.0**	**290**	**97.6**	**701**	**99.9**	**1159**	**97.6**
2010	88	98.9	90	84.1	256	93.1	638	98.8	1072	96.0
2009	76	100.0	95	85.6	297	93.1	659	99.2	1127	96.0

NHS QIS Standard 4a.2
Audit has a minimum of 90% cases with TNM stage recorded at diagnosis.

All health boards, excepting D&G (which records a 'near miss'), have attained the Standard. Routine recording of staging at MDM has generally resulted in consistent completeness of stage data over the three year period.

The Action Plan in last year's Report required improvements in TNM recording at MDT meetings. This is reflected in the consistent recording across all boards. The slightly lower rates for D&G in 2011 reflect the implementation date occurring half way through 2011. In 2012 it is expected that all health boards will achieve excellent TNM recording completeness.

Stage Groups

Table 10.2: Stage Group: NSCLC
n = all patients diagnosed with NSCLC in **2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
I & II	16	32.0	12	17.4	31	23.0	108	28.7	167	26.5
III	19	38.0	20	29.0	31	23.0	100	26.6	170	27.0
IV	15	30.0	32	46.4	71	52.6	168	44.7	286	45.4
NR	-	-	5	7.2	2	1.5	-	-	7	1.1
Total	**50**		**69**		**135**		**376**		**630**	

Table 10.3: Stage Group: SCLC
n = all patients diagnosed with SCLC in **2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
I & II	1	6.7	NR	-	1	2.1	2	2.7	4	2.7
III	4	26.7	NR	-	16	33.3	26	34.7	46	30.9
Sub total (LD)	**5**	**33.3**	**6**	**54.5**	**17**	**35.4**	**28**	**37.3**	**56**[6]	**37.6**
IV (or ED)	**10**	**66.7**	**5**	**45.5**	**30**	**62.5**	**47**	**62.7**	**92**	**61.7**
NR	-	-	-	-	1	2.1	-	-	1	0.7
Total	**15**		**11**		**48**		**75**		**149**	

Table 10.4: Stage Group: Imaging Diagnoses (No and Neg Pathology)
n = all patients diagnosed via imaging in **2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
I & II	5	21.7	1	5.0	25	21.9	83	33.1	114	27.9
III	5	21.7	4	20.0	19	16.7	54	21.5	82	20.1
IV	13	56.5	6	30.0	66	57.9	113	45.0	198	48.5
NR	-	-	9	45.0	4	3.5	1	0.4	14	3.4
Total	**23**		**20**		**114**		**251**		**408**	

[6] Subtotal SCAN SCLC (LD) patients includes 6 patients D&G recorded as LD disease with no TNM available.

TREATMENT MANAGEMENT

Anti-Cancer Treatment

Table 11: Frequency of Anti-Cancer Treatment: All Patients
n=all patients diagnosed with lung cancer in **2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
Anti-cancer treatment[7]	57	64.8	63	63.0	159	53.5	395	56.3	674	56.8
No active treatment	29	32.9	36	36.0	131	44.1	248	35.3	444	37.4
Refused treatment	2	2.3	1	1.0	4	1.3	24	3.4	31	2.6
Died before treatment	-	-	-	-	3	1.0	35	5.0	38	3.2
Total	**88**		**100**		**297**		**702**		**1187**	

NLCA (8)
Active anti-cancer treatment rates below the England and Wales average of 60% should be reviewed.

The proportion of patients receiving anti-cancer treatment is a quality measure used by the UK National Lung Cancer Audit (NLCA) and is not a Scottish Standard. Anti-cancer treatment rates for SCAN overall are below the recommended level set by UK NLCA.

A recent comorbidity study[8] shows that COPD, a factor in determining non-surgical management of NSCLC, does appear to be significantly more common in Fife than in other parts of Scotland. A multivariate analysis is proposed (age, sex, stage, pathology, comorbidity and deprivation) to further investigate and this is included in the current Action Plan. However, it should be noted that in a recent study: *Explaining variations in lung cancer in Scotland* [9], Fife, which appears to have the lowest treatment rate at 49.8% in 2009, has survival rates at 1 (2004-2008) and 5 years (2000-2004) which are commensurate, and sometimes better, than other areas in Scotland.

2010
n=all patients diagnosed with lung cancer in **2010**

	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
Anti-cancer treatment	59	66.3	74	69.2	145	52.7	389	60.2	667	59.7
No active treatment	25	28.1	33	30.8	106	38.5	178	27.5	342	30.6
Refused treatment	1	1.1	-	-	5	1.8	36	5.6	42	3.8
Died before treatment	4	4.5	-	-	19	6.9	43	6.7	66	5.9
Total	**89**		**107**		**275**		**646**		**1117**	

2009
n=all patients diagnosed with lung cancer in **2009**

	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
Anti-cancer treatment	56	73.7	78	70.3	159	49.8	414	62.3	707	60.4
No active treatment	16	21.0	28	25.2	144	45.1	189	28.5	377	32.2
Refused treatment	-	-	3	2.7	13	4.1	29	4.4	45	3.8
Died before treatment	4	5.3	1	0.9	3	0.9	31	4.7	39	3.3
Not recorded	-	-	1	0.9	-	-	1	0.1	2	0.2
Total	**76**		**111**		**319**		**664**		**1170**	

[7] Anti-cancer treatment includes any form of radiotherapy, chemotherapy, and/or surgery. It excludes best supportive care and watchful waiting. Treatments such as stenting and steroids that are not followed by surgery, chemotherapy or radiotherapy are regarded as best supportive care/no active treatment.
[8] *Variation in comorbidity and clinical management in patients newly diagnosed with lung cancer in four Scottish centres* (2011).
[9] The Roy Castle Lung Cancer Foundation: *Explaining variations in lung cancer in Scotland*. (November 2011).

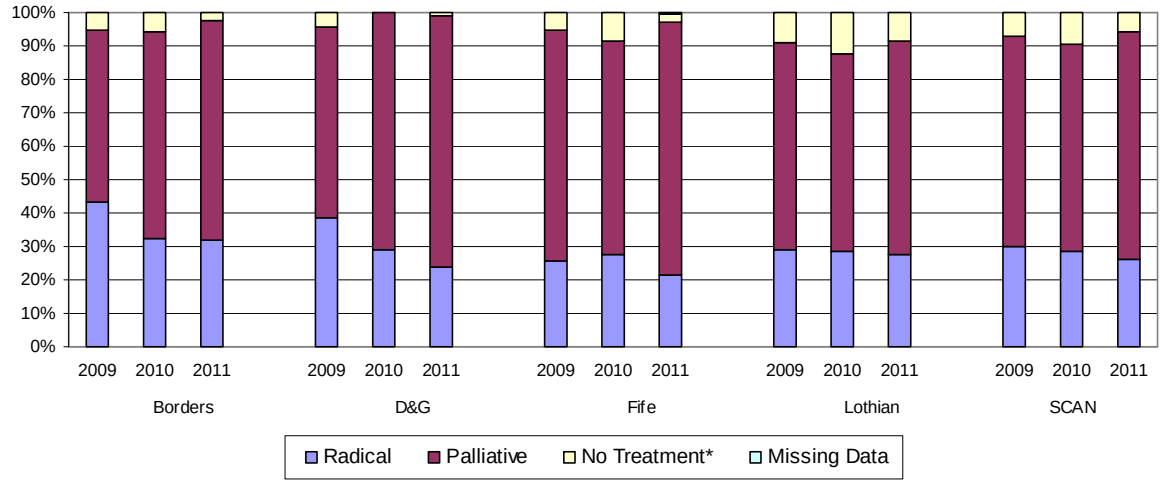
Type of Treatment

Table 12: Type of Treatment (First Treatment Only) – All Patients – All Stages
n=all patients diagnosed with lung cancer in **2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Surgery	13	14.8	12	12.0	27	9.1	75	10.7	127	10.7
Radical RT[10]	8	9.1	5	5.0	21	7.1	69	9.8	103	8.7
Chemoradiation	7	7.9	7	7.0	21	7.1	51	7.3	86	7.2
Chemotherapy	15	17.0	19	19.0	47	15.8	91	13.0	172	14.5
Palliative RT	13	14.8	20	20.0	42	14.1	108	15.4	183	15.4
Radiotherapy (Missing data)	-	-	-	-	1	0.3	-	-	1	0.1
Other treatment	1	1.1	-	-	-	-	1	0.1	2	0.2
BSC	29	33.0	36	36.0	131	44.1	248	35.3	444	37.4
Refused treatment	2	2.3	1	1.0	4	1.3	24	3.4	31	2.6
Died before treatment	-	-		-	3	1.0	35	5.0	38	3.2
Total	**88**		**100**		**297**		**702**		**1187**	

NHS QIS Standard 5a.4
The percentage of patients receiving treatment with curative intent is recorded.

Fig (vi): Treatment Type (First Treatment, All Patients) – Distribution by Health Board/SCAN 2009 – 2011



* No Treatment: Refused treatment or died before treatment

Curative treatment rates are generally consistent across the three years reported. UK curative rates are difficult to establish as often only 'first treatment' is reported resulting in an under-reporting of sequential chemoradiation. In SCAN, audit collects and reports on data for first treatment and additionally for the whole 'treatment package'. Table 12 and Fig (vi) show first treatment rates while subsequent treatment tables have focused on the whole treatment package, representing all treatment given: 'first', adjuvant, sequential chemoradiation and additional palliative treatments.

[10] RT: Radiotherapy

Treatment Management by Stage

Pre-treatment stage is crucial to determine optimal treatment management and outcome. Treatment shown here represents the whole 'treatment package' and in this section includes all NSCLC and SCLC patients with pathology AND imaging diagnoses.

NSCLC: Treatment by Stage

Table 13.1: Treatment of Stage I & II NSCLC (pathology or imaging diagnoses)
n=all patients diagnosed NSCLC (pathologically or by imaging) – Stage I/II in **2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
Surgery	10	47.6	10	76.9	21	37.5	66	34.6	107	38.1
Radical RT	4	19.0	2	15.4	12	21.4	50	26.2	68	24.2
Chemoradiation	2	9.5	-	-	1	1.8	3	1.6	6	2.1
Chemotherapy	-	-	-	-	1	1.8	-	-	1	0.4
Chemo + pall RT	-	-	-	-	-	-	-	-	-	-
High dose pall RT	-	-	-	-	1	1.8	2	1.0	3	1.1
Low dose pall RT	-	-	-	-	3	5.4	9	4.7	12	4.3
Other treatment	-	-	-	-	-	-	-	-	-	-
BSC	3	14.3	1	7.7	16	28.6	52	27.2	72	25.6
Refused treatment	2	9.5	-	-	1	1.8	7	3.7	10	3.6
Died before treatment	-	-	-	-	-	-	2	1.0	2	0.7
Total	**21**		**13**		**56**		**191**		**281**	

NLCA (7)
For early stage (I and II) disease, [surgical] rates below 52% should be reviewed to ensure that patients on the margins of operability/resectability are being offered access to specialist thoracic surgical expertise.

Following the 2009 Action Plan, MDT meetings generally have surgical input and teleconferencing has been adopted in Fife to facilitate this.

The 2010 Action Plan included Treatment Audit of stage I & II patients diagnosed in 2010 in Lothian. This showed that while only 38.5% received surgical resection in 2010, 70% of stage I & II patients received active treatment. Review of patients' notes demonstrated four main reasons why patients did not receive surgery: patient choice (5%), comorbidities (30%), "not surgical candidate" (30%) and reason not known (35%).Those who did not receive active treatment had serious comorbidities or other major illnesses and were therefore not candidates for surgical intervention.

Following the audit, all early stage patients including those of borderline operability are subject to full and detailed discussion prior to treatment management decisions and where a patient is considered not suitable as a surgical candidate, the reasons are recorded. This has been implemented at MDT meetings in Lothian and other health boards in the SCAN region as part of the ongoing Action Plan.

The results for 2011 (Table 13.1) indicate a similar result for percentage of stage I & II patients having active treatment – 64% - of whom 37.7% of patients have resection.

Table 13.2: Treatment of Stage III NSCLC (pathology or imaging diagnoses)
n=all patients diagnosed NSCLC (pathologically or by imaging) – Stage III in **2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
Surgery	2	8.3	1	4.2	4	8.0	9*	5.8	16*	6.3
Radical RT	4	16.7	3	12.5	6	12.0	17	10.9	30	11.8
Chemoradiation	2	8.3	5	20.8	4	8.0	24	15.4	35	13.8
Chemotherapy	3	12.5	-	-	6	12.0	6	3.8	15	5.9
Chemo + pall RT	1	4.2	2	8.3	1	2.0	7	4.5	11	4.3
High dose pall RT	-	-	4	16.7	4	8.0	7	4.5	15	5.9
Low dose pall RT	4	16.7	4	16.7	2	4.0	19	12.2	29	11.4
Other treatment	1	4.2	-	-	-	-	-	-	1	0.4
BSC	7	29.2	5	20.8	20	40.0	44	28.2	76	29.9
Refused treatment	-	-	-	-	2	4.0	11	7.1	13	5.1
Died before treatment	-	-	-	-	1	2.0	12	7.7	13	5.1
Total	**24**		**24**		**50**		**156***		**254***	

* 2 x Lothian patients' surgery was 'open & shut'. These patients had subsequent options and are recorded in this table twice (Due to additional 2 entries: Lothian Total = 156 rather than 154 and SCAN total = 254 rather than 252)

Table 13.3: Treatment of Stage IV NSCLC (pathology or imaging diagnoses)
n=all patients diagnosed NSCLC (pathologically or by imaging) – Stage IV in **2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
Surgery*	1	3.6	-	-	1	0.7	2	0.7	4	0.8
Radical RT	-	-	-	-	3	2.2	1	0.4	4	0.8
Chemoradiation	-	-	1	2.6	2	1.5	3	1.1	6	1.2
Chemotherapy	4	14.3	5	13.2	22	16.1	30	10.7	61	12.6
Chemo + pall RT	2	7.1	4	10.5	2	1.5	25	8.9	33	6.8
High dose pall RT	-	-	3	7.9	8	5.8	2	0.7	13	2.7
Low dose pall RT	6	21.4	8	21.1	19	13.9	60	21.4	93	19.3
Other treatment	-	-	-	-	-	-	1	0.4	1	0.2
BSC	15	53.6	17	44.7	77	56.2	136	48.6	245	50.8
Refused treatment	-	-	-	-	1	0.7	5	1.8	6	1.2
Died before treatment	-	-	-	-	2	1.5	15	5.3	17	3.5
Total	**28**		**38**		**137**		**280**		**483**	

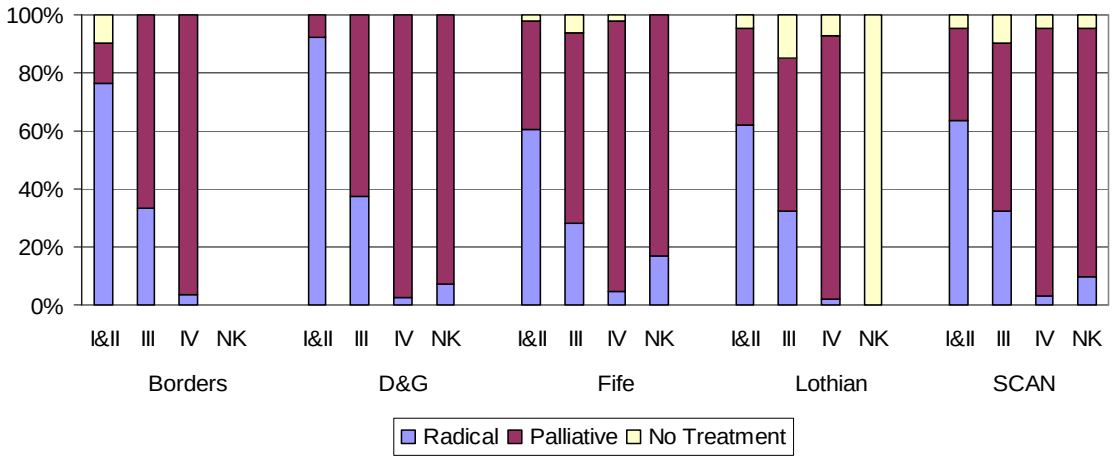
* Surgery is generally not a treatment option for stage IV lung cancer patients but in certain circumstances can be appropriate.

Table 13.4: Treatment of Stage Not Recorded NSCLC (pathology or imaging diagnoses)
n=all patients diagnosed NSCLC (pathologically or by imaging) – Stage NR in **2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
Surgery	-	-	1	7.1	1	16.7	-	-	2	9.5
Radical RT	-	-	-	-	-	-	-	-	-	-
Chemoradiation	-	-	-	-	-	-	-	-	-	-
Chemotherapy	-	-	-	-	-	-	-	-	-	-
Chemo + pall RT	-	-	-	-	-	-	-	-	-	-
High dose pall RT	-	-	-	-	-	-	-	-	-	-
Low dose pall RT	-	-	1	7.1	-	-	-	-	1	4.8
Other treatment	-	-	-	-	-	-	-	-	-	-
BSC	-	-	12	85.7	5	83.3	-	-	17	80.9
Refused treatment	-	-	-	-	-	-	-	-	-	-
Died before treatment	-	-	-	-	-	-	1	100	1	4.8
Total	**0**		**14**		**6**		**1**		**21**	

Early stage presentation and diagnosis is fundamental to the objectives of the Scottish Government's *Detect Cancer Early Initiative* which aims to promote early stage cancer diagnosis and treatment to improve survival.[11] Surgery provides the most effective curative treatment for early stage lung cancer while, in comparison, patients who present with advanced stage disease have more limited treatment options and poorer outcomes.

Fig (vii): Treatment Type (NSCLC) – Distribution by Stage & Health Board/SCAN 2011



No Treatment: Refused treatment or died before treatment

SCLC: Treatment by Stage

Treatment by stage for small cell lung cancer is usually based on limited and extensive disease categories. Stage I, II and III aggregated are aligned with limited disease while stage IV is equivalent to extensive disease.

Table 14.1: Treatment of SCLC - Limited Disease (Stage I + II + III)

n=all patients diagnosed SCLC (pathologically or by imaging) – Stages I, II & III (Ltd) in **2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	%	n	%	n	%	n	%	n	%
	-	-	-	-			-	-	-	-
ChemoRad[12] plus PCI[13]	1	20.0	-	-	9	52.9	16	57.1	26	46.4
ChemoRad no PCI	2	40.0	1	16.7	4	23.5	3	10.7	10	17.9
Chemotherapy	-	-	2	33.3	1	5.9	4	14.3	7	12.5
Chemo + PCI	-	-	3	50.0	-	-	-	-	3	5.4
Chemo + Pall RT + PCI	1	20.0	-	-	-	-	-	-	1	1.8
Chemo + Pall RT	-	-	-	-	-	-	1	3.6	1	1.8
Palliative Radiotherapy	1	20.0	-	-	1	5.9	2	7.1	4	7.1
Radical Radiotherapy	-	-	-	-	-	-	-	-	-	-
Radiotherapy (missing data)	-	-	-	-	1	5.9	-	-	1	1.8
Best Supportive Care	-	-	-	-	1	5.9	2	7.1	3	5.4
Refused Treatment Died before Treatment	-	-	-	-	-	-	-	-	-	-
Total	**5**		**6**		**17**		**28**		**56**	

[11] Scottish Government: *Stakeholder Engagement: Detect Cancer Early Initiative (breast, colorectal and lung cancer)*, 01 Aug 2011

[12] ChemoRad: Chemoradiation

[13] PCI: Prophylactic Cranial Irradiation

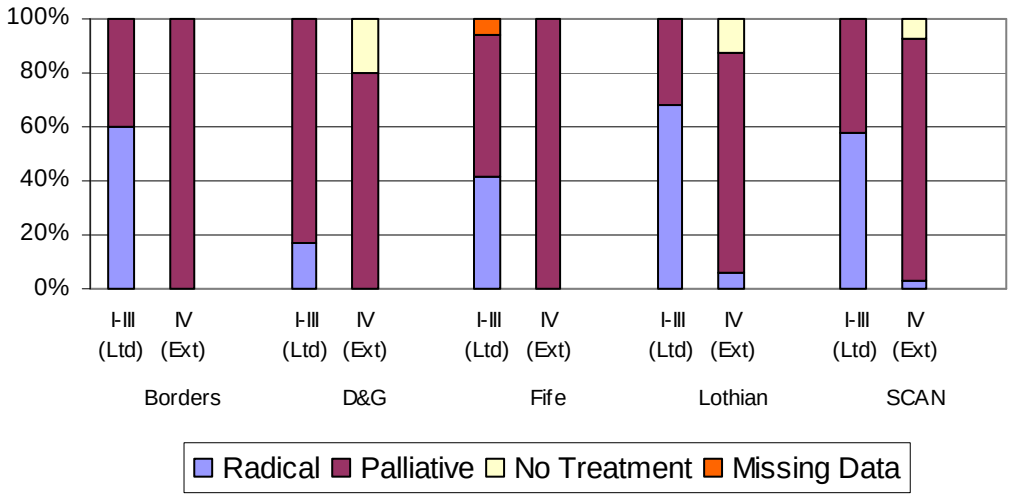
Table 14.2: Treatment of SCLC – Extensive Disease (Stage IV)
n=all patients diagnosed SCLC (pathologically or by imaging) – Stage IV (Ext) in **2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
ChemoRad + PCI	-	-	-	-	-	-	2	4.1	2	2.1
ChemoRad no PCI	-	-	-	-	-	-	1	2.0	1	1.1
Radical RT + PCI	-	-	-	-	-	-	1	2.0	1	1.1
Chemotherapy	3	30.0	1	20.0	13	43.3	6	12.2	23	24.5
Chemo + PCI	-	-	-	-	-	-	-	-	-	-
Chemo + pall RT + PCI	-	-	-	-	1	3.3	4	8.2	5	5.3
Chemo + pall RT	1	10.0	2	40.0	-	-	8	16.3	11	11.7
Palliative Radiotherapy	2	20.0	-	-	4	13.3	7	14.3	13	13.8
BSC	4	40.0	1	20.0	12	40.0	14	28.6	31	33.0
Refused treatment	-	-	1	20.0	-	-	1	2.0	2	2.1
Died before treatment	-	-	-	-	-	-	5	10.2	5	5.3
Total	**10**		**5**		**30**		**49***		**94***	

* Lothian (and SCAN) total includes 1 x SCLC diagnosed via imaging.

NHS QIS Standard 5c.6
The percentage of SCLC patients treated with concurrent chemoradiotherapy are recorded.

Fig (viii): Treatment Type SCLC – Distribution by Stage & Health Board/SCAN 2011



No Treatment: Refused treatment or died before treatment

SCLC (Limited Disease) – Oncology Treatment Management

Table 15.1: LD SCLC patients receiving chemotherapy and PCI.
n=all patients diagnosed with SCLC – Ltd Disease in **2009**, **2010** & **2011** plus chemotherapy.

	Borders		D&G		Fife		Lothian		SCAN	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Total LD SCLC + Chemo (2011)	**4**		**6**		**14**		**23**		**47**	
Chemo or ChemoRad + PCI	2	50.0	3	50.0	9	64.3	16	69.6	30	63.8
Total LD SCLC + Chemo (2010)	**4**		**3**		**8**		**22**		**37**	
Chemo or ChemoRad + PCI	4	100	1	33.3	3	37.5	15	68.1	23	62.2
Total LD SCLC + Chemo (2009)	**5**		**5**		**11**		**33**		**54**	
Chemo or ChemoRad + PCI	3	60.0	3	60.0	6	54.5	14	42.4	26	48.1

NHS QIS Standard 5c.7
A minimum of 60% of those LD SCLC patients receiving chemotherapy subsequently receive prophylactic cranial irradiation (PCI).

A relevant factor in determining eligibility for PCI is age which is contraindicated in patients over 70 years. PCI is also not offered to patients who have suffered a previous cerebrovascular accident or to those considered too frail. Allowance should also be made where small numbers and variation may be due to chance.

Table 15.2: LD SCLC patients receiving chemotherapy and plus consolidation radiotherapy to chest
n=all patients diagnosed with SCLC – Ltd Disease in **2009**, **2010** & **2011** plus chemotherapy.

	Borders		D&G		Fife		Lothian		SCAN	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Total LD SCLC + Chemo (2011)	**4**		**6**		**14**		**23**		**47**	
Chemo + RT to chest	3	75.0	1	16.7	13	92.9	20	87.0	37	78.7
Total LD SCLC + Chemo (2010)	**4**		**3**		**8**		**22**		**37**	
Chemo + RT to chest	4	100	3	100	5	62.5	18	81.8	30	81.1
Total LD SCLC + Chemo (2009)	**5**		**5**		**11**		**33**		**54**	
Chemo + RT to chest	4	80.0	5	100	9	81.8	19	57.6	37	68.5

NHS QIS Standard 5c.5
A minimum of 60% of those limited (LD) SCLC patients receiving chemotherapy also receive consolidation radiotherapy to the chest.

Where populations are small it is useful to aggregate the results over time to clarify findings, for example: D&G aggregated over the 3 year period demonstrates 64.3%.

ANTI-CANCER TREATMENTS

Surgery

Table 16: Frequency of Surgery
n=all patients diagnosed with lung cancer in **2009**, **2010** and **2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Total patients (2011)	**88**		**100**		**297**		**702**		**1187**	
Surgery	13	14.8	12	12.0	27	9.1	77[14]	11.0	129	10.9
Total patients (2010)	**89**		**107**		**275**		**646**		**1117**	
Surgery	11	12.4	14	13.1	25[15]	9.1	77	11.9	127	11.4
Total patients (2009)	**76**		**111**		**319**		**664**		**1170**	
Surgery	12	15.8	8	7.2	32	10.0	85	12.8	137	11.7

Thoracic surgery is performed at the Edinburgh Royal Infirmary for patients diagnosed in Lothian, Fife and Borders while Dumfries & Galloway patients generally attend the Golden Jubilee Hospital, Glasgow.

Table 16.1: Type of Surgery for Resection of Primary Tumour
n=all patients treated surgically diagnosed with lung cancer in **2011**

	Borders		D&G		Fife		Lothian		SCAN	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Pneumonectomy	2	15.4	-	-	1	3.7	9	11.7	12	9.3
Lobectomy	9	69.2	9	75.0	26	96.3	58	75.3	102	79.1
Wedge or Segmentectomy	2	15.4	3	25.0	-	-	8	10.4	13	10.1
Other	-	-	-	-	-	-	2[16]	2.6	2	1.6
Total	**13**		**12**		**27**		**77**		**129**	

NHS QIS Standard 5b.4
Less than 10% of patients that undergo surgery are resected by wedge or segmentectomy.

Wedge and segmentectomy facilitate surgery for patients with impaired respiratory function. Furthermore, segmentectomy may be more difficult than lobectomy. Procedures include tri- and quad basal segmentectomies; lingulectomy and left upper trisegmentectomy.

The percentage of wedge or segmentectomy in D&G (25.0%) is higher than recommended by Standard 5b.4 and the rates recorded by other health boards in the network. However, data collection and analysis of small populations, where rates may greatly fluctuate from year to year, can create a degree of statistical instability. When aggregated, an average of 11.9% of patients received wedge or segmentectomy over a five year period (2007 – 2011) in D&G.

NHS QIS Standard 5b.9
The 30-day mortality rate following final lung cancer surgery specific to the procedure performed is recorded and discussed at team meetings.

A *Thirty-Day Mortality after Surgery* study has been carried out and will be reported independently of this Report.

[14] LOTHIAN 2011: 2 x surgery patients = 'open & shut' (resection was not appropriate). Subsequent treatment given: 1 x chemoradiation & 1 x refused further treatment.
[15] FIFE 2010: 2 x surgery patients = 'open & shut'.
Subsequent treatment given: 1 x chemoradiation & 1 x radical radiotherapy.
[16] LOTHIAN: Other = 'open & shut'

Post-Operative/Adjuvant Treatment

Adjuvant Chemotherapy

Adjuvant chemotherapy is offered to patients with a complete resection of non-small cell lung cancer of stages II or IIIA, except T4 (see Appendix 4) and is based on the LACE[17] meta-analysis. It should not be given for stage IIIA (T4) and IIIB (T4 or N3) disease as these patients are excluded from the trials. The benefits and side effects need to be carefully considered for each individual as the absolute benefit is small (around 5% improvement).

Table 17: Adjuvant Chemotherapy based on Pathological N Stage[18]

n=all surgery patients diagnosed with lung cancer in **2011**

	Borders		D&G		Fife		Lothian		SCAN	
Total surgery patients	**13**		**12**		**27**		**75[19]**		**127**	
	✓	✖	✓	✖	✓	✖	✓	✖	✓	✖
pN0	-	9	-	9	-	17	2	58	2	93
pN1	-	2	1	1	3	4	2	7	6	14
pN2	1	1	-	-	-	-	1	4	2	5
pN3	-	-	-	-	-	-	-	1	-	1
pNx	-	-	-	1	-	3	-	-	-	4
NR	-	-	-	-	-	-	-	-	-	-

✓ Received adjuvant chemotherapy

✖ Did not receive adjuvant chemotherapy

Post-Operative Radiotherapy (PORT)

PORT is offered to patients with incomplete resection of NSCLC with involved central margins or incomplete resection of N2 disease. The benefit is small and needs to be weighed against potential for toxicity in each case. Resection completeness is measured following full macroscopic and histological examination of the specimen. Excision is considered complete if no evidence of primary tumour is identified at the bronchial, vascular, mediastinal and, if appropriate, chest wall resection margins. Metastatic carcinoma in hilar or mediastinal lymph nodes should not show evidence of extracapsular spread and the free visceral pleural surface should be free of tumour.

Table 18: Post-operative radiotherapy (PORT) by Excision Completeness

n=all surgery patients diagnosed with lung cancer in **2011**

		Borders		D&G		Fife		Lothian		SCAN	
		n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
Total surgery patients		**13**		**12**		**27**		**75**		**127**	
Excision complete	PORT	-	-	-	-	1	3.7	-	-	1	0.8
	No PORT	9	69.2	10	83.3	21	77.8	63	84.0	103	81.1
Excision incomplete	PORT	1	7.7	1	8.3	1	3.7	6	8.0	9	7.1
	No PORT	3	23.1	-	-	3	11.1	5	6.7	11	8.7
Excision not known	PORT	-	-	-	-	-	-	-	-	-	-
	No PORT	-	-	1	8.3	1	3.7	1	1.3	3	2.4

NHS QIS Standard 5c.3

The % of patients with incomplete resection receiving post-operative radiotherapy are recorded.

[17] LACE: Lung Adjuvant Cisplatin Evaluation: a pooled analysis of five randomised clinical trials (see Appendix 1).

[18] N Stage: pN0=no regional lymph node metastasis; pN1=Ipsilateral peribronchial and/or ipsilateral hilar and intrapulmonary lymph nodes; pN2=Ipsilateral mediastinal and/or subcarinal lymph nodes; pN3=Contralateral mediastinal, contralateral hilar lymph nodes, ipsilateral or contralateral scalene or supraclavicular lymph nodes(s); pNx=Regional lymph nodes cannot be assessed; NR= not recorded.

[19] The total surgery patients for Lothian in Tables 17 & 18 do not include the 2 'open and shut cases referred to earlier in the report.

Table 19: Complete Excision and PORT based on pathological N stage
n=all surgery patients diagnosed with lung cancer and with complete excision in **2011**

	Borders		D&G		Fife		Lothian		SCAN	
Total patients: Complete excision	**9**		**10**		**22**		**63**		**104**	
	✓	✖	✓	✖	✓	✖	✓	✖	✓	✖
pN0	-	7	-	9	-	14	-	52	-	82
pN1	-	1	-	1	1	4	-	8	1	14
pN2	-	1	-	-	-	3	-	2	-	6
pN3	-	-	-	-	-	-	-	1	-	1
pNx	-	-	-	-	-	-	-	-	-	-
NR	-	-	-	-	-	-	-	-	-	-

✓ Received PORT
✖ Did not receive PORT

NHS QIS Standard 5c.2
Patients with completely resected N0/N1 tumours do not receive postoperative radiotherapy (PORT).

The Standard has been met by all health boards. PORT has not been given to any patients with completely resected tumours, including N0/N1.

Radiotherapy

Table 20: Radiotherapy by Curative Potential: All Patients Receiving Radiotherapy
n=all patients receiving radiotherapy diagnosed with lung cancer in **2009**, **2010** and **2011**

ALL PATIENTS	**Borders**		**D&G**		**Fife**		**Lothian**		**SCAN**	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
2011										
Radical	16	47.1	13	30.2	44	48.4	127	45.5	200	44.8
Palliative	18	52.9	30	69.8	46	50.5	152	54.5	246	55.0
Not recorded	-	-	-	-	1	1.1	-	-	1	0.2
2010										
Radical	17	38.6	16	32.0	52	51.5	115	42.3	200	42.8
Palliative	27	61.4	34	68.0	49	48.5	157	57.7	267	57.2
2009										
Radical	21	55.3	29	44.6	50	43.1	112	40.6	212	42.8
Palliative	17	44.7	35	53.9	66	56.9	164	59.4	282	57.0
Not recorded	-	-	1	1.5	-	-	-	-	1	0.2

Radiotherapy totals (radical and palliative) are derived from the whole 'treatment package' and include patients who have post-operative radiotherapy and palliative treatment given in addition to 'first' treatment.

NHS QIS Standard 5a.3
The percentage of all patients diagnosed with lung cancer receiving radiotherapy is recorded.

Radiotherapy: NSCLC

Table 20.1: Radiotherapy by Curative Potential: NSCLC patients only

n=all patients diagnosed with NSCLC (pathology diagnosis) in 2009, 2010 and **2011**

NSCLC only	**Borders**		**D&G**		**Fife**		**Lothian**		**SCAN**	
	n	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
2011										
Radical	10	20.0	11	15.9	20	14.8	68	18.1	109	17.3
Palliative	8	16.0	22	31.9	25	18.5	92	24.5	147	23.3
Total Radiotherapy	**18**	**36.0**	**33**	**47.8**	**45**	**33.3**	**160**	**42.6**	**256**	**40.6**
Total NSCLC patients	50		69		135		376		630	
2010										
Radical	10	19.2	11	14.1	34	23.3	68	18.0	123	18.8
Palliative	17	32.7	26	33.3	35	24.0	107	28.4	185	28.3
Total Radiotherapy	**27**	**51.9**	**37**	**47.4**	**69**	**47.3**	**175**	**46.4**	**308**	**47.1**
Total NSCLC patients	52		78		146		377		653	
2009										
Radical	10	25.6	24	35.8	34	18.2	69	18.3	137	20.4
Palliative	8	20.5	21	31.3	54	28.9	112	29.7	195	29.1
Not recorded	-	-	1	1.5	-	-	-	-	1	0.1
Total Radiotherapy	**18**	**46.1**	**46**	**68.6**	**88**	**47.1**	**181**	**48.0**	**333**	**49.6**
Total NSCLC patients	39		67		187		377		670	

NHS QIS Standard 5c.4
A minimum of 10% NSCLC patients receive radical radiotherapy dose.
NHS QIS Standard 5c.8
A minimum of 35% NSCLC patients receive palliative radiotherapy.

The rate of palliative radiotherapy is lower than NHS QIS guidelines in all three years but this is a consequence of the higher usage of radical radiotherapy, around 10% higher than recommended in each of the three years. This offers more patients a better chance of cure.

Chemotherapy: NSCLC

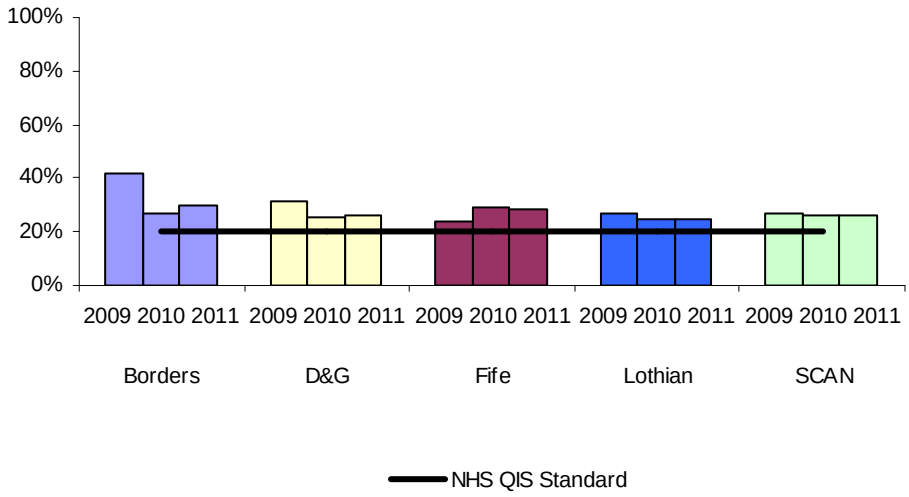
Table 21: Frequency of Chemotherapy: NSCLC
n=all patients diagnosed with **NSCLC** (pathology diagnosis) in **2009**, **2010** and **2011**

NSCLC	Borders		D&G		Fife		Lothian		SCAN	
2011	**n = 50**		**n = 69**		**n = 135**		**n = 376**		**n = 630**	
Chemotherapy	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**
	15	30.0	18	26.1	38	28.1	92	24.5	163	25.9
2010										
Chemotherapy	14	26.9	20	25.6	42	28.8	93	24.7	169	25.9
2009										
Chemotherapy	16	41.0	21	31.3	45	24.1	98	26.0	180	26.9

Chemotherapy totals are derived from the whole 'treatment package' of NSCLC patients with *pathological* only diagnoses.

NHS QIS Standard 5d.2
A minimum of 20% of NSCLC patients receive chemotherapy.

Fig (ix): Chemotherapy NSCLC by Health Board 2009 – 2011



This Standard is consistently achieved by all Health Boards in the SCAN region, with SCAN overall reporting 25.9% of NSCLC patients receiving chemotherapy in 2010.

Chemotherapy: SCLC

Table 22: Frequency of Chemotherapy for SCLC

n=all patients diagnosed with **SCLC** (pathology diagnosis) in **2009**, **2010** and **2011**

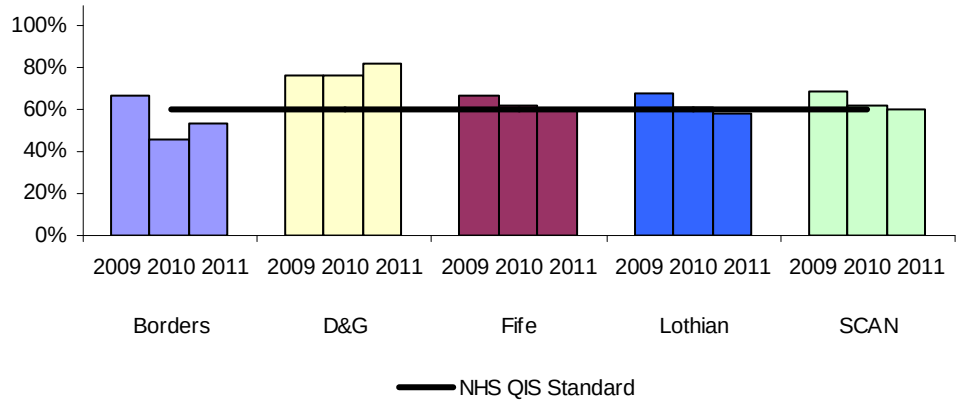
SCLC	Borders		D&G		Fife		Lothian		SCAN	
2011	n = 15		n = 11		n = 48		n = 75		n = 149	
Chemotherapy	n	%	n	%	n	%	n	%	n	%
	8	53.3	9	81.8	29	60.4	44	58.7	90	60.4
2010										
Chemotherapy	5	45.5	13	76.5	23	62.2	49	61.3	90	62.1
2009										
Chemotherapy	8	66.7	16	76.2	26	66.7	63	67.7	113	68.5

Chemotherapy totals are derived from the whole 'treatment package' of SCLC patients with *pathological* only diagnoses.

NHS QIS Standard 5d.1
A minimum of 60% of SCLC patients receive chemotherapy.

Figure (x) shows an analysis of performances of each health board and SCAN overall measured against Standard 5d.1 over the most recent three year period.

Fig (x): Chemotherapy SCLC by Health Board 2009 – 2011



Over the current 3-year period a fall in the percentage of patients diagnosed with SCLC receiving chemotherapy has been noted. The NHS QIS Standard is no longer being met in Borders and a general decline in numbers is demonstrated. As part of SCAN's ongoing Action Plan audits were carried out in Lothian and Borders in 2010[20].

In Lothian in 2010 the audit showed 31 patients did not receive chemotherapy for SCLC. These patients were older, of poor performance status, had advanced stage disease (stage IV) and a tendency to more ischaemic heart disease compared to those that did not receive chemotherapy. Similarly, in Borders 6 patients who were diagnosed with SCLC and did not receive chemotherapy were found to be older and of poor performance status. These patients presented with extensive disease and liver metastases. 5 were seen by an oncologist in Borders.

Out of the 31 patients in Lothian, 10 were seen by an oncologist and all had clearly documented significant comorbidity or personal reasons for declining chemotherapy. Those

[20] Lothian audit by Dr Melanie Mackean, Consultant Medical Oncologist, Edinburgh Cancer Centre: October 2011; Borders audit by Professor Allan Price, Consultant Clinical Oncologist, Edinburgh Cancer Centre January 2012.

who did not meet with an oncologist presented with poor performance status (3 or 4) and had a very poor survival from initial presentation.

APPENDICES

Appendix 1: Glossary

Adenocarcinoma
This type of cancer develops from glandular cells which produce mucus in the lining of the airways. This is classified as a type of non-small cell lung cancer.

Adjuvant Therapy
A treatment given in addition to the main or primary treatment (for example, chemotherapy given after surgery) to try to prevent a cancer recurring.

Anti-cancer Treatment
Anti-cancer treatment includes any form of radiotherapy, chemotherapy, and/or surgery. It excludes best supportive care and watchful waiting. Treatments such as stenting and steroids that are not followed by surgery, chemotherapy or radiotherapy are regarded as best supportive care/no active treatment.

Audit
Audit is the measurement and evaluation of care against best practice with a view to improving current practice and care delivery.

Biopsy
A biopsy is a small tissue sample taken for microscopic examination and diagnosis.

Bronchoscopy
An examination used for inspection of the interior of the tracheo-bronchial tree, performance of endobronchial diagnostic tests, taking of specimens for biopsy and culture, and removal of foreign bodies.

BSC
Best Supportive Care or palliative care with medicines given to control any symptoms. See also **palliative care**.

Cancer
The name given to a group of diseases that can occur in any organ of the body, and in blood, and which involve abnormal or uncontrolled growth of cells.

Carcinoid
A carcinoid tumour is a rare, mostly slow growing, type of neuroendocrine tumour.

Case Ascertainment (Estimated)
Number of cases recorded as a proportion of those expected using the average of the most recent available five years reported in the Scottish Cancer Registry.

Case-mix
Population of patients with different prognostic factors.

Chemotherapy
The use of drugs that destroy cancer cells, or prevent or slow their growth.

Chemoradiation
Term used to describe chemotherapy and radiotherapy used in combination. This can be adjuvant, neoadjuvant or concurrent.

Co-morbidity
The condition of having two or more diseases at the same time.

Concurrent Therapy
A treatment that it given at the same time as another treatment.

Consolidation Radiotherapy
Treatment to stop the cancer coming back once it is in remission. The aim is to kill any remaining cancerous cells.

COPD (Chronic Obstructive Pulmonary Disease)
Chronic Obstructive Pulmonary Disease is the name for a collection of lung diseases including chronic bronchitis, emphysema and chronic obstructive airways disease.

CT Guided Lung FNA / Biopsy
A Computed Tomography scan is used to accurately locate the abnormality and mark a spot on the chest through which the biopsy needle will be passed to obtain FNA (fine needle aspirate/fluid) or biopsy for pathological diagnosis.

CT (Computed Tomography) Scan
An X-ray imaging technique used in diagnosis that can reveal many soft tissue structures not shown by conventional radiography. A computer is used to assimilate multiple X-ray images into a two-dimensional cross-sectional image.

Cytology/Cytological
The study of the structure and function of cells under the microscope, and of their abnormalities.

Diagnosis
Confirmation of the presence of the disease.

EBUS
Endobronchial Ultrasound is a form of bronchoscopy where the bronchoscope is fitted with an ultrasound probe which allows visualisation and sampling of mediastinal and hilar lymph nodes.

ED or EXT SCLC (Extensive Small Cell Lung Cancer)
The cancer has spread outside the lung, within the chest area or to other parts of the body. TNM Stage IV is equivalent to extensive disease.

FNA Biopsy
Fine needle aspiration biopsy involves the extraction of cells in fluid through a fine needle for microscopic examination and diagnosis.

GRO Records
General Register Office Records provide official government information on births, marriages and deaths.

Histology/Histological
The study of cells and tissue on the microscopic level.

LACE Meta-analysis
Lung Adjuvant Cisplatin Evaluation (LACE): A pooled analysis of five randomized clinical trials including 4,584 patients. *Journal of Clinical Oncology*, 2006 ASCO Annual Meeting Proceedings Part I. Vol 24, No. 18S (June 20 Supplement), 2006: 7008.

Large Cell Carcinoma
Consists of large, rounds cells which are seen under the microscope. It is sometimes known as undifferentiated carcinoma. This is classified as a type of non-small cell lung cancer.

LCNS (Lung Cancer Nurse Specialist)
A Lung Cancer Nurse Specialist is a first level nurse, locally recognised as part of the specialist lung cancer multidisciplinary team and designated as a specialist in lung cancer. The nurse should spend at least 50% of his or her time caring for lung cancer patients. It is recognised that the Lung Cancer Nurse Specialist may be practising within a sub speciality of oncology, respiratory nursing, thoracic nursing or specialist palliative care. [*National Lung Cancer Forum*].

LD or LTD SCLC (Limited Small Cell Lung Cancer)
Limited disease is cancer that can only be seen in one lung, in nearby lymph nodes or in fluid around the lung (pleural effusion). TNM Stages I, II and III aggregated are equivalent to limited disease.

Lobe/Lobes
A section of an organ. The right lung has three lobes and the left has two.

Lobectomy
The surgical removal of a lobe of the lung.

Managed Clinical Network (MCN)
A formally organised network of clinicians. The main function is to audit performance on the basis of standards and guidelines, with the aim of improving healthcare across a wide geographic area, or for specific conditions.

MDM
The Multi-Disciplinary Meeting of the MDT. See **MDT**.

MDT: Multi-Disciplinary Team
A multi-professional group of people from different disciplines (both healthcare and non-healthcare) who work together to provide care for patients with a particular condition. The composition of multi-disciplinary teams will vary according to many factors. These include: the specific condition, the scale of the service being provided; and geographical/socio-economic factors in the local area.

Mesothelioma
Mesothelioma is a type of cancer that most often starts in the covering of the lungs (pleural mesothelioma) but can also start in the abdomen (peritoneal mesothelioma).

Mixed NSCLC
Includes lung cancer with mixed NSCLC components e.g. adenosquamous.

Most Valid Basis of Diagnosis
This is the best evidence in support of the diagnosis of cancer. It is based on one or several pathological procedures or clinical investigations. Histological confirmation is considered the most valid basis of diagnosis.

Neoadjuvant Therapy
Treatment given as the first step to shrink the tumour prior to the main treatment.

Neuroendocrine Tumours
Neuroendocrine tumours (NETs) are rare cancers. The commonest type is carcinoid tumour, which grows most often in the appendix and small bowel, but may occur in other parts of the digestive system, lung, pancreas, kidney, ovaries and testicles.

NLCA
National Lung Cancer Audit which reports on patients diagnosed in England and Wales and to which Scotland contributes data (www.ic.nhs.uk)

NR
Not Recorded.

NSCLC (Non-Small Cell Lung Cancer)
A group of lung cancers that are named for the kinds of cells and how the cells look under a microscope. The three main types of non-small cell lung cancer are squamous cell carcinoma, large cell carcinoma and adenocarcinoma. Other types include mixed components and NSCLC (not otherwise specified (NOS)). Non-small cell lung cancer is the most common kind of lung cancer.

NSCLC (NOS)
Non-small cell lung cancer (not otherwise specified) includes undifferentiated carcinoma and large cell undifferentiated which cannot be further specified.

Other Malignancy
To describe lung cancers reported as “malignant cells’ or ‘carcinoma (not otherwise specified)’.

Other Specific NSCLC
This accounts for other specific NSCLC including salivary-type carcinomas.

Outcome
The end result of care and treatment and/or rehabilitation: the change in health, functional ability, symptoms or situation of a person, which can be used to measure the effectiveness of care and treatment, and/or rehabilitation.

Palliative Care
Palliative care is the active total care of patients and their families by a multi-professional team when the patient’s disease is no longer responsive to curative treatment.

Palliative Radiotherapy
When it is not possible to cure a cancer, radiotherapy can be given to alleviate symptoms and improve quality of life. Lower doses are given than for curative or radical radiotherapy and generally over a shorter period of time.

Pathology
The study of disease processes with the aim of understanding their nature and causes. This is achieved by observing samples of fluid and tissues obtained from the living patient by various methods, or at a post mortem.

Pathological Diagnosis
The microscopic examination (histological or cytological) of the specimen by a pathologist to determine the presence of malignancy and the classification of the malignant tumour.

PCI (Prophylactic Cranial Irradiation)
Radiation therapy to the brain to prevent cancer seeding.

Pneumonectomy
An operation to remove an entire lung.

PORT
Post-operative radiotherapy. PORT is offered to patients with incomplete resection of non-small cell lung cancer with involved central margins or incomplete resection of N2 disease

Primary Tumour
Original site of the cancer. The mass of tumour cells at the original site of abnormal tissue growth.

PS: (WHO [World Health Organisation] Performance Status)
Performance Status is an overall assessment of the functional/physical performance of the patient (see Appendix 2 for further details).

Radical Radiotherapy
Radiotherapy is given with the aim of destroying cancer cells to attain cure.

Resection
Surgical removal of a portion of any part of the body.

RT (Radiotherapy)
The use of radiation, usually X-rays or gamma rays, to kill tumour cells.

SCLC (Small Cell Lung Cancer)
A type of lung cancer in which the cells are small and round.

Segmentectomy
Removal of part of the lung less than a lobe. See **lobe**.

Squamous Cell Carcinoma
This is the commonest type of lung cancer. It develops in the cells which line the airways.

Staging
The process of determining whether cancer has spread. Staging involves clinical, surgical, radiological and pathological assessment (see Appendices 3 and 4 for further details).

Thoracic
Relating to the chest.

TNM Classification
TNM classification provides a system for staging the extent of cancer. T refers to the size and position of the primary tumour. N refers to the involvement of the lymph nodes. M refers to the presence or absence of distant metastases (see Appendices 3 and 4).

Tumour
An abnormal mass of tissue. A tumour may be either benign (not cancerous) or malignant. A tumour is also known as a neoplasm.

Undifferentiated
Undifferentiated is a term used to describe very immature cells that are not specialised. If a cancer cell is completely undifferentiated, it may not be possible to tell its origin.

Wedge
A surgically removed triangle-shaped portion of lung containing a tumour and a small amount of normal tissue around it. A tissue wedge may also be removed for biopsy.

Appendix 2: Performance Status

WHO/ECOG PERFORMANCE STATUS (PS) CATEGORIES

0	Fully active. Able to carry on all pre-disease performance without restriction
1	Restricted in physically strenuous activities but ambulatory and able to carry out work of a light and sedentary nature.
2	Ambulatory and capable of all self-care but unable to carry out many work activities; up and about more than 50% waking hours.
3	Capable of only limited self-care; confined to bed or a chair for more than 50% of waking hours.
4	Completely disabled; unable to carry out any self-care; totally confined to bed or a chair.

Appendix 3: TNM Classification

TNM Classification
(TNM Classification of Malignant Tumours, Seventh Edition, UICC, 2010)

T – Primary Tumour		
T0	**No evidence of primary tumour**	
Tx	**Unable to establish tumour extent despite positive cytology**	
Tis	**Carcinoma in situ**	
T1	**Tumour ≤3cm in greatest dimension, surrounded by lung or visceral pleura, without bronchoscopic evidence of invasion more proximal than the lobar bronchus (i.e. not in main bronchus)**	
	T1a	**≤ 2cm**
	T1b	**> 2cm but ≤ 3cm**
T2	**Tumour ≥ 3cm but not > 7cm; or tumour with any of the following:** o **Involves main bronchus ≥ 2cm distal to carina** o **Invades visceral pleura** o **Associated atelectasis or obstructive pneumonitis that extends to hilar region but doesn't involve entire lung**	
	T2a	**> 3cm but ≤ 5cm**
	T2b	**> 5cm but ≤ 7cm**
T3	**Tumour > 7cm OR with any of the following features:** o **Direct invasion of chest wall (including superior sulcus tumour), diaphragm, phrenic nerve, mediastinal pleura, parietal pleura or parietal pericardium** o **Tumour in the main bronchus < 2cm from main carina** o **Associated atelectasis or obstructive pneumonitis that involves the entire lung** o **Separate tumour nodule(s) in the same lobe as the primary**	
T4	**Tumour of ANY size with evidence of invasion of:** o **Mediastinum, heart, great vessels, trachea, recurrent laryngeal nerve, oesophagus, vertebral body, carina** o **Separate tumour nodule(s) in different lobe (ipsilateral) to primary tumour**	
N – Regional Lymph Nodes		
Nx	**Regional Lymph nodes cannot be assessed**	
N0	**No regional lymph node metastasis**	
N1	**Ipsilateral peribronchial and/or ipsilateral hilar and intrapulmonary lymph nodes, including by direct extension**	
N2	**Ipsilateral mediastinal and/or subcarinal lymph nodes**	
N3	**Contralateral mediastinal, contralateral hilar lymph nodes, ipsilateral or contralateral scalene or supraclavicular lymph node(s)**	
M – Distant Metastasis		
M0	**No distant metastasis**	
M1	**Distant Metastasis**	
	M1a	**Separate tumour nodule(s) in a contralateral lobe; tumour with pleural nodules or malignant pleural or pericardial effusion i.e. intrathoracic metastasis**
	M1b	**Distant metastasis i.e. extra thoracic metastasis**

Appendix 4: TNM Stage Groups

Stage Group	Tumour	Nodal	Metastases
Stage IA	T1a	N0	M0
	T1b	N0	M0
Stage IB	T2a	N0	M0
Stage IIA	T2b	N0	M0
	T1a	N1	M0
	T2a	N1	M0
Stage IIB	T3	N0	M0
	T1b	N1	M0
	T2b	N1	M0
Stage IIIA	T4	N0 or N1	M0
	T3	N1	M0
	T1a/T1b/T2a/T2b or T3	N2	M0
Stage IIIB	T4	N2	M0
	T1a/T1b/T2a/T2b/T3 or T4	N3	M0
Stage IV	T1a/T1b/T2a/T2b/T3 or T4	N0/N1/N2 or N3	M1a
	T1a/T1b/T2a/T2b/T3 or T4	N0/N1/N2 or N3	M1b

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