

# How to manage lung cancer in primary care

Lung cancer remains the most common malignancy (Doll and Peto, 1996). Increasing knowledge about its association with cigarette smoking has not led to an appreciable reduction in deaths. This article will discuss all aspects of lung cancer management since patients with this illness invariably receive treatment from both primary and secondary care, often at the same time. However, hospital care will be discussed briefly, to allow a focus on areas relevant to primary care nursing. Preventive strategies (i.e. smoking cessation) are beyond the scope of this article, and are well covered elsewhere in the nursing literature.

The management of acute illness by nurses in primary care is becoming more common (Lakasing et al, 2004), and practice nurses may therefore be the first point of contact for lung cancer patients. Nurses manage most chronic respiratory disease in the community, and patients with chronic obstructive pulmonary disease (COPD) have a high incidence of lung cancer owing to similar risk factors, so that a high index of suspicion is required for this common illness. Sadly, the prognosis for most patients is poor and most clinical contact will involve palliative care, therefore this aspect of care is given appropriate attention.

## Aetiology

Lung cancer has a strong association with cigarette smoking. This was suspected during the early 19th century, but was proven beyond doubt in a seminal study by Doll and Hill (1954). More tenuous links exist with other chemicals that may enhance the carcinogenic effect of tobacco, especially asbestos, polycyclic hydrocarbons and radon (Neville, 2005).

## Epidemiology

Lung cancer accounts for 17% of all cancer notifications in the UK and 24% of cancer deaths (Doll and Peto, 1996). There are about 35 000 new cases annually, so that an average GP surgery with 6000 patients will see three to four new cases per year. The male to female ratio is 3:1, but as mortality has levelled off in men it has risen in women, reflecting changes in smoking habits. Lung

cancer is the commonest malignancy in men and second only to breast cancer in women (Kumar and Clark, 2005), but causes more deaths owing to its poor prognosis. The usual age of presentation is in the sixth decade, but new cases are being seen in younger patients (Jablons and Cameron, 2003).

Lung cancer has a poor prognosis. Most patients die within 6 months of diagnosis, and the 5-year survival rate in England is about 6% (Thames Cancer Registry, 1995). This is unsurprising given that most patients are middle-aged or elderly smokers likely to have cardiorespiratory comorbidity. Other factors implicated in a poor prognosis are late presentation and the presence of undetected metastases even in patients undergoing surgery (Muers, 1994).

## Clinical features

Symptoms of lung cancer follow a logical progression owing to local irritation, metastatic spread, and systemic manifestations of the disease. More than 90% of patients are symptomatic at presentation, although occasionally cancer is detected as a chance finding on a chest X-ray.

Cough, or a worsening of a pre-existing cough, is the most common symptom with 75% of patients reporting this (Anderson and Prakash, 1982). Breathlessness is a common feature (60%), and may be the result of the direct effects of the tumour, associated pleural effusion, atelectasis (collapse of a lobe of the lung owing to bronchial occlusion), invasion of the phrenic nerve causing diaphragmatic paralysis, or a secondary pneumonia; indeed, a pneumonia that fails to resolve within a reasonable timescale is a suspicious symptom. Weight loss is also common on presentation (68%), and cachexia with negative nitrogen balance is frequent in later disease (Lowden, 1998). Chest pain (45%) and haemoptysis (35%) are somewhat less common presentations.

Central invasion of the tumour may affect the recurrent laryngeal nerve and result in hoarseness due to vocal cord paralysis. The sympathetic chain may be invaded, causing drooping of the eyelid and constriction of the

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present an overview  
of the pathology of  
lung cancer and  
how to manage  
the symptoms of  
treatment*

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Submitted for peer review 3 October 2005; accepted for publication 14 November 2005

**Key words:** Lung cancer, palliative care, symptom management, general practice

**Table 1. Definitions**

**Horner's syndrome**

Johann F Horner (1831–1886), Professor of Ophthalmology, Zürich, Switzerland, described the ptosis and miosis of the eye owing to damage to the thoracic sympathetic chain.

**Pancoast's tumour**

Henry K Pancoast (1875–1939), Professor of Radiology, University of Pennsylvania, Philadelphia, USA, described arm pain owing to invasion of the brachial plexus in apical lung cancer.

**Cushing's syndrome**

Harvey Cushing (1869–1939), Professor of Surgery, Harvard University, Boston, USA, described the causes and clinical features of corticosteroid excess.

**Kulchitsky cells**

Nicholas Kulchitsky (1856–1925), a Ukrainian anatomist and histologist who worked at the Universities of Kharkov, Kasan, St Petersburg and University College Hospital, London, described cells in the lung and gut that secrete polypeptide hormones.

pupil (Horner's Syndrome) (Table 1). Enlarged lymph nodes within the mediastinum may compress the superior vena cava, causing massive oedema of the face and arms, i.e. superior vena cava syndrome, which is a medical emergency. External pressure on the oesophagus may cause dysphagia. Apical tumours invading the chest wall and ribs may extend to the brachial plexus, causing pain over the shoulder and inner aspect of the arm (Pancoast's tumour).

Distant metastases most commonly affect the liver. Bony secondaries are also common, causing pain and sometimes pathological fracture. Deposits in the brain may cause headache, personality change, epilepsy or focal neurological weakness. Rarer manifestations are hypertrophic pulmonary osteoarthropathy, adrenal failure owing to secondaries there, ectopic secretion of adrenocorticotrophic hormone (ACTH) causing Cushing's Syndrome, and the syndrome of inappropriate anti-diuretic hormone (SIADH). Finger clubbing may occur in squamous cell carcinoma.

**Pathology**

Lung cancer is broadly divided into small cell lung cancer (SCLC), which accounts for 20% of cases, and non-small cell lung cancer (NSCLC), which comprises 80% of the disease. This distinction is important, because the characteristics of the tumours and their response to treatment varies (Kumar and Clark, 2005).

Small-cell lung cancer is also called oat-cell carcinoma, and arises from endocrine-secreting Kulchitsky cells within the lung, hence the occasional excessive hormonal secretion that is seen clinically. These tumours are quite virulent and metastasize rapidly.

Non-small cell lung cancer is further subdivided into three types. The luminal surface of the bronchial tree normally consists of mucus-secreting columnar epithelium with cilia, the tiny hairy extensions that move mucus. In smokers, the chronic irritation leads to the erosion of this and its replacement by cruder squamous cells, a process called squamous metaplasia. The commonest tumour is therefore squamous cell carcinoma. The second type is adenocarcinoma, which develops from the aforementioned mucus-secreting cells. The third type is anaplastic (also known as large cell) carcinoma, consisting of large, poorly-differentiated rounded cells; it is also an aggressive tumour.

Lung cancer is staged using the tumour, nodes, metastases (TNM) classification (Mountain, 1986) (Table 2).

**Investigations and referral**

When lung cancer is suspected in primary care the most important initial investigation is the chest X-ray, which can usually be done almost immediately. In most patients this will show a distinct shadow. Where there is no obvious change but clinical suspicion remains, urgent referral to a chest physician should still be made in accordance with the British Thoracic Society (BTS) guidelines (BTS Standard of Care Committee, 1998).

The aim of investigations in secondary care is to provide histological diagnosis and determine staging of the disease so that treatment can be planned. It is likely that the chest X-ray will be repeated, and further radiological imaging may involve computed tomography and/or magnetic resonance imaging (MRI) scanning to delineate intrathoracic disease spread. It is desirable to conduct histological diagnosis via bronchoscopy or, for peripheral tumours, via lung biopsy. Liver function tests, a liver ultrasound scan and an isotope bone scan are used to survey the common sites of distant metastases.

**Treatment options**

**Surgery**

Surgery offers patients the best hope of cure. This is a considerable undertaking, and additional tests to ascertain cardiorespiratory function, including electrocardiogram (ECG) and spirometry, must be done; the minimum forced expiratory volume in 1 second (FEV<sub>1</sub>) required for surgery is 0.8 litres (Morgan, 1996). Surgery is the treatment of choice for stage 1 and 2 non-small cell lung cancer.

However, resection rates in the UK, at around 10%, are lower than the 28% estimated for the USA (Humphrey et al, 1990) and also lower than the European rate (Damhuis and Schütte, 1996), which averages 18%. Moreover, the 5-year survival rate of 35–40% following resection (Jablons and Cameron, 2003) remains disappointingly low.

### Radiotherapy

Radiotherapy may be used curatively in some cases of non-small cell lung cancer, particularly for respectable lesions where the patient's fitness, or wishes, preclude surgery. In advanced cancer, radiotherapy is useful for palliation of cough, haemoptysis, chest pain, as well as distant metastases in bone, brain and skin. In small cell lung cancer, radiotherapy can be used to consolidate thoracic radiotherapy, which improves overall survival (Pignon et al, 1992) and as prophylactic cranial irradiation, which slightly decreases the incidence of metastases and confers a 5.6% greater chance of survival in patients who have achieved remission with chemotherapy (Auperin et al, 1999).

### Chemotherapy

In general, chemotherapy is used to induce remission in non-small cell lung cancer, which

usually presents in an advanced stage. Platinum-based agents have demonstrated a modest survival benefit although symptomatic improvement is proportionately greater (NSCLC Collaborative Group, 1995). In contrast, small cell lung cancer may respond, at least temporarily, to a single agent (e.g. etoposide). It is usually managed by combination chemotherapy.

### Palliative care

Palliative care accounts for the majority of time primary care nurses spend with patients suffering from lung cancer. Excellent communication skills and psychological support are essential to effective patient care. Lung cancer carries the stigma associated with smoking, and patients may bear the guilt of a (possibly) self-inflicted illness.

The key factors in well-managed palliative care are efficient teamwork and humane clinical care, including symptom relief. This is true for all dying patients, so that in this section the focus is weighted toward factors of particular relevance to lung cancer.

An individually tailored needs assessment should be carried out either soon after the diagnosis or when a pre-terminal stage of illness has been reached. Each stage of the illness requires review of the care plan in part-

**Table 2. The tumour-node-metastasis (TNM) classification of lung cancer**

#### Definition of features

Tumour		Nodes	
Tx	Positive cytology only	N1	Peribronchial ipsilateral hilar
T1	Tumour < 3 cm	N2	Ipsilateral mediastinal
T2	Tumour > 3 cm, or has extended to hilar region and invaded visceral pleura or there is partial atelectasis	N3	Contralateral mediastinal, scalene or supra-clavicular
T3	Involvement of chest wall, diaphragm, mediastinum, pleura, and total atelectasis	<b>Metastasis</b>	
T4	Involvement of heart, great vessels, trachea, oesophagus, and malignant effusion	M0	No metastases
		M1	Metastases have occurred

#### Definition of stages

Stage 1	T1 or T2, N0, M0 (non-small cell lung cancer)
Stage 2	T1 or T2, N1, M0 (non-small cell lung cancer)
Stage 3(a)	Any T3 or N2, M0
Stage 3(b)	T4, any N3, M0
Stage 4	Distant metastases
Operable tumours are T1, T2, T3, N0, N1 and N2	

**Table 3. Situations in which palliative care at home is unsuitable**

Patient does not wish to die at home
Poor or absent carer support
Carers cannot cope
Distressing symptoms that cannot be managed in the home, e.g. haematemesis, large haemoptysis
Inadequate symptom control

nership with the patient and his/her family. The nurse should assess problems and plan appropriate practical, psychosocial and spiritual interventions (Quinn, 1999). Many patients with lung cancer will be receiving palliative treatment such as radiotherapy and chemotherapy in hospital, and will therefore be under the joint care of a hospital and his/her practice.

A joint consultation with the nurse, GP, patient and carer(s), either in the practice or the patient's home, is useful for initial assessment and planning future care. Continued efficient liaison between members of the primary health-care team and out-of-hours medical and nursing services is essential. There are many outside agencies that can help, including Macmillan and Marie Curie nurses, physiotherapists, social services and specialist palliative care nurses such as hospice-based palliative care teams.

An important consideration is the desired place of death. Studies consistently show that about 75% of people wish to die at home (Karlsen and Addington-Hall, 1998), although only about 24% do so (Bosanquet, 1997). There are many societal reasons for this discrepancy, and availability of resources is a significant contributing factor (Storey et al, 2003). However, it is also clear that primary care is under-achieving in this area.

The authors' practice has set up an integrated nursing team that works closely with the doctors to support carers and patients at home. This has resulted in enabling over 50% of terminally ill patients to die at home (Lakasing and Mahaffey, 2005). This must not be the sole aim, however; primary care has much to offer patients who eventually die in hospital, and *vice versa*. Conversely, there are factors that preclude care at home (Table 3).

#### Symptom control

Common symptoms in lung cancer include pain, breathlessness, excessive respiratory secretion, nausea and vomiting, constipation, anorexia, convulsions and depression. This list is not exhaustive, and reference can be made to the excellent overview of palliative care in the *British National Formulary* (Joint Formulary Committee, 2005: 14–18).

**Pain:** Lung cancer is not usually painful in the early stages, but local spread (for exam-

ple, to the pleura and chest wall) and distant metastases result in significant pain. Mild-to-moderate pain may be managed with a paracetamol or a mild opioid such as co-dydramol or tramadol. In more severe pain opiates should be used, and morphine is the mainstay. This can initially be given as an oral solution (e.g. Oramorph), with typical initiating doses of 10–20 mg up to four times daily. Morphine solution provides rapid analgesia for the patient, and allows a calculation of daily requirement to be made. Oral tablets allowing twice-daily administration can then follow (e.g. MST Continus), with the liquid form for breakthrough pain. Morphine can be used rectally as suppositories.

An alternative to morphine is fentanyl transdermal patches which are changed every 72 hours. In the very late stages of illness diamorphine via a syringe driver may be required, and the associated nausea and vomiting may be managed by adding haloperidol or methotrimeprazine. Hyoscine butylbromide may also be required for excessive respiratory secretion.

Opiates are vital in significant pain and a reluctance to use them early may result in unnecessary discomfort or referral. They are not addictive if used for real pain (as opposed to recreational use), and the fact that they cause respiratory depression may help the breathless patient. Two other types of pain are common and require additional treatment. Bone pain owing to metastatic deposits responds well to non-steroidal anti-inflammatory drugs (NSAIDs), e.g. diclofenac 50 mg three times a day, and neuropathic pain (e.g. in Pancoast's tumour) may be helped by a tricyclic antidepressant (e.g. amitriptyline) or gabapentin. In resistant pain local nerve blocks may help.

**Breathlessness** is almost always present and, as discussed previously, invariably has several coexistent causes. It is associated, in particular, with poor quality of life because it restricts activity and causes isolation (Cox, 2002). Non-drug manoeuvres include sitting near a window or using a fan to increase air circulation. Opiates and benzodiazepines can reduce psychological distress, and treatment may be needed for selective causes, e.g. antibiotics for chest infection (Corner and O'Driscoll, 1999).

Oxygen can safely be used at home as long as nobody in the house smokes in the vicinity of the cylinder. The usual oxygen cylinder is the size f (1360 litres) though, and ambulant

patients may use a portable (size dd) when outside the house. If continuous use is required then a concentrator should be used.

**Excessive respiratory secretion:** This late manifestation giving rise to the 'death rattle' is best managed with hyoscine hydrobromide given by subcutaneous injection at a dose of 400–600 mg 4–8 hourly.

**Nausea and vomiting:** These common symptoms are often the result of the side effects of chemotherapy, radiotherapy or opiates. With the latter it is good practice to give an anti-emetic continuously at introduction for 5 days, e.g. cyclizine 50 mg three times daily, then as required. Metoclopramide or haloperidol are also useful.

**Cough** is the most common symptom in lung cancer as mentioned above. When it is the result of the direct effect of the tumour, cough may be ameliorated by codeine linctus at a dose of 10–20 ml as need. Specific causes may require separate treatment, for example, antibiotics for a chest infection.

**Constipation** is likewise often the result of opiates, and a laxative should be offered. Lactulose, co-danthramer and senna are reasonable choices.

**Anorexia** is common in late illness and may be helped by corticosteroids, e.g. prednisolone 15–30 mg daily or dexamethasone 2–4 mg daily. These drugs may have the benefit of improving the patient's mood and subjective wellbeing.

**Convulsions** are invariably the result of cerebral metastases. Standard anticonvulsants such as phenytoin or carbamazepine usually suffice. When oral treatment is not feasible rectal diazepam or subcutaneous phenobarbital may be used. Raised intracranial pressure owing to cerebral oedema requires dexamethasone at a dose of up to 16 mg daily.

**Depression** is a frequent comorbidity with any significant physical illness. An antidepressant may be used, and if insomnia is present a benzodiazepine sedative is useful, e.g. temazepam 10 mg at night.

## Conclusions

Lung cancer is the commonest malignancy in the UK. When suspected in primary care early referral to a specialist is advisable to identify the patients who may be cured by surgery and to administer radiotherapy and/or chemotherapy to those who will benefit. The overall prognosis is poor, however, and the key role for nurses is in palliation of symptoms through spiritual, social or physical care.

## References

- Anderson HA, Prakash UBS (1982) Diagnosis of symptomatic lung cancer. *Seminars in Respiratory Medicine* 3: 165–75
- Auperin A, Arriagada R, Pignon JP et al (1999) Prophylactic cranial irradiation for patients with small cell lung cancer in complete remission. Prophylactic Cranial Irradiation Overview Collaborative Group. *N Engl J Med* 341: 476–84
- Bosanquet N (1997) New challenges for palliative care. *BMJ* 314: 915–8
- Corner J, O'Driscoll M (1999) Development of a breathlessness assessment guide for use in palliative care. *Palliative Medicine* 13(5): 375–84
- Cox C (2002) Non-pharmacological treatment of breathlessness. *Nursing Standard* 16(24): 33–6
- Damhuis RAM, Schütte PR (1996) Resection rates and post-operative mortality in 7899 patients with lung cancer. *Eur Respir J* 9: 7–10
- Doll R, Hill AB (1954) The mortality of doctors in relation to their smoking habits. *BMJ* 228: 1451–5
- Doll R, Peto P (1996) *Oxford Textbook of Medicine*. Oxford University Press, Oxford
- Humphrey EW, Smart CR, Winchester DP (1990) National survey of the pattern of care for carcinoma of the lung. *J Thorac Cardiovasc Surg* 100: 837–43
- Jablons D, Cameron RB (2003) Neoplasms of the lung. In: Way LW, Doherty GM, eds. *Current Surgical Diagnosis and Treatment*. 11th edn: 395–407
- Joint Formulary Committee (2005) *British National Formulary* 50. September. BMA and Royal Pharmaceutical Society of Great Britain, London
- Karlsen S, Addington-Hall J (1998) How do cancer patients who die at home differ from those who die elsewhere? *Palliative Medicine* 12: 279–86
- Kumar P, Clark M (2005) *Clinical Medicine*. 6th edn. WB Saunders, Edinburgh
- Lakasing E, Knott M, Buckingham M (2004) Nurse-led acute illness clinics. *The New Generalist* 2(4): 57–9
- Lakasing E, Mahaffey W (2005). A practice-based survey of mortality patterns and terminal care provision. *Br J Community Nurs* 10(8): 378–80
- Lowden B (1998) The care and treatment of lung cancer. *Nursing Times* 19(9): 61–2
- British Thoracic Society Standards of Care Committee, Lung Cancer Working Party (1998) BTS recommendations to respiratory physicians organising care of patients with lung cancer. *Thorax* 53(Suppl 1): 51–8
- Morgan WE (1996). The surgical management of lung cancer. *Br J Hosp Med (Lond)* 55(10): 631–4
- Mountain CF (1986) A new international staging system for lung cancer. *Chest* 89(Suppl): 225–33
- Muers MF (1994) How much investigation? In Thatcher N, Spiro S, eds. *Perspectives in Lung Cancer*. BMJ Publishing Group, London
- Neville A (2005) Lung cancer. *Clinical Evidence Concise* 13: 442–4
- NSCLC Collaborative Group (1995) Chemotherapy in non-small-cell lung cancer: A meta-analysis using updated data on individual patients from 52 randomised clinical trials. *BMJ* 311: 899–909
- Pignon JP, Arriagada R, Ihde DC et al (1992) A meta-analysis of thoracic radiotherapy for small cell lung cancer. *N Engl J Med* 372: 1618–24
- Quinn S (1999) Lung cancer: The role of the nurse in treatment and prevention. *Nurs Stand* 13(41): 49–54
- Storey L, Pemberton C, Howard A et al (2003) Place of death: Hobson's choice or patients' choice? *Cancer Nursing Practice* 2(4): 33–8
- Thames Cancer Registry (1995) *Cancer in South East England, 1992*. Thames Cancer Registry, Sutton

## KEY POINTS

- Lung cancer remains the most common malignancy and most common cause of cancer death
- Early referral to hospital for disease staging and treatment is recommended
- Treatment may include surgery, radiotherapy or chemotherapy or a combination
- The prognosis is poor with a 5-year survival rate in the UK of around 6%
- Primary care nurses have a vital role in providing and coordinating palliative care with medical and other nursing colleagues

## Conflict of interest:

None