

Nurse led follow up and conventional medical follow up in management of patients with lung cancer: randomised trial

Sally Moore, Jessica Corner, Jo Haviland, Mary Wells, Emma Salmon, Charles Normand, Mike Brada, Mary O'Brien, Ian Smith



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Abstract

Objective To assess the effectiveness of nurse led follow up in the management of patients with lung cancer.

Design Randomised controlled trial.

Setting Specialist cancer hospital and three cancer units in southeastern England.

Participants 203 patients with lung cancer who had completed their initial treatment and were expected to survive for at least 3 months.

Intervention Nurse led follow up of outpatients compared with conventional medical follow up.

Outcome measures Quality of life, patients' satisfaction, general practitioners' satisfaction, survival, symptom-free survival, progression-free survival, use of resources, and comparison of costs.

Results Patient acceptability of nurse led follow up was high: 75% (203/271) of eligible patients consented to participate. Patients who received the intervention had less severe dyspnoea at 3 months ($P=0.03$) and had better scores for emotional functioning ($P=0.03$) and less peripheral neuropathy ($P=0.05$) at 12 months. Intervention group patients scored significantly better in most satisfaction subscales at 3, 6, and 12 months ($P<0.01$ for all subscales at 3 months). No significant differences in general practitioners' overall satisfaction were seen between the two groups. No differences were seen in survival or rates of objective progression, although nurses recorded progression of symptoms sooner than doctors ($P=0.01$). Intervention patients were more likely to die at home rather than in a hospital or hospice ($P=0.04$), attended fewer consultations with a hospital doctor during the first 3 months ($P=0.004$), had fewer radiographs during the first 6 months ($P=0.04$), and had more radiotherapy within the first 3 months ($P=0.01$). No other differences were seen between the two groups in terms of the use of resources.

Conclusion Nurse led follow up was acceptable to lung cancer patients and general practitioners and led to positive outcomes.

Introduction

Despite substantial evidence that intensive follow up after cancer treatment may not lead to improvements in survival or quality of life, is inefficient at detecting recurrence, and is highly cost ineffective, most patients with cancer are routinely seen in outpatient clinics for many years.¹⁻⁵ The high degree of psychological morbidity among cancer patients suggests a need for close monitoring and support^{6,7}; however, little evidence shows that routine follow up in busy clinics actually provides an environment conducive to supporting patients after a diagnosis of cancer. Doctors and nurses often fail

to detect patients' emotional distress,⁸ and patients report that appointments are so "high speed" that they have little time to raise concerns.⁹

This collaborative study evaluated a reconfigured nurse led follow up service for patients with lung cancer. The service was designed to enhance care across primary, secondary, and tertiary sectors and to reduce the burden on patients and acute services by rationalising the numbers of routine hospital appointments and investigations.

Methods

We conducted the study at a specialist cancer hospital and three local cancer units. Patients with lung cancer who had completed their initial anticancer treatment and were expected to survive for at least three months were invited to participate. Patients were randomised to either conventional medical follow up or nurse led follow up.

Protocol

The care of patients randomised to conventional medical follow up remained unchanged. Conventional care consisted of routine outpatient appointments (one post-treatment appointment, then appointments at two or three month intervals) for medical assessment and investigations to monitor disease progression. Patients were also seen on the basis of need.

Patients randomised to nurse led follow up were allocated to one of two clinical nurse specialists in lung cancer and were assessed monthly by protocol over the telephone or in a nurse led clinic to identify signs of disease progression, symptoms warranting intervention, or serious complications (see bmj.com).¹⁰ Additional contacts were made as necessary: patients had access to the clinical nurse specialists in the nurse led clinic or by telephone without an appointment. Clinical nurse specialists focused on providing information and support and coordinating input from other agencies or services. The clinical nurse specialist was responsible for the entire care of patients in the nurse led follow up group, unless the patient needed further treatment. The mean number of contacts with patients was three per month: 14% of these contacts were initiated by patients. The mean length of contact was 23 (range 2-120) minutes. The clinical nurse specialists were prepared for the role by observing outpatient lung cancer clinics and shadowing medical consultants. Medical consultants and nurse academics gave regular clinical supervision sessions for the clinical nurse specialists.

Outcome measures

Primary outcomes were quality of life and patients' satisfaction at three months. We assessed quality of life¹¹ at baseline and at monthly intervals and patients' satisfac-

Centre for Cancer and Palliative Care Studies, Institute of Cancer Research, Royal Marsden Hospital, London SW3 6JJ

Sally Moore
research practitioner

Jo Haviland

statistician

Mary Wells

research practitioner

School of Nursing and Midwifery, University of Southampton, Southampton SO17 1BJ

Jessica Corner
professor of cancer and palliative care

Clinical Trials and Statistics Unit, Section of Epidemiology, Institute of Cancer Research, Sutton, Surrey SM2 5NG

Emma Salmon
statistician

Department of Epidemiology and Public Health, London School of Hygiene and Tropical Medicine, London WC1A 7HT

Charles Normand
professor of health economics

Royal Marsden Hospital, Sutton, Surrey SM2 5PT

Mike Brada
reader and consultant in clinical oncology

Mary O'Brien
consultant in oncology

Ian Smith
professor of cancer medicine

Correspondence to: J Corner
j.l.corner@soton.ac.uk

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Table 1 Scores on quality of life core questionnaire and lung cancer module three months after randomisation. Values are medians (interquartile ranges)

Item	Follow up		P value*
	Nurse led (n=76)	Conventional (n=74)	
Physical functioning	86.7 (86.7-93.3)	86.7 (86.7-93.3)	0.22
Role functioning	66.7 (33.3-100)	66.7 (33.3-83.3)	0.26
Emotional functioning	83.3 (66.7-97.9)	75.0 (66.7-91.7)	0.58
Cognitive functioning	83.3 (66.7-100)	83.3 (66.7-100)	0.47
Social functioning	83.3 (66.7-100)	66.7 (50.0-100)	0.22
Global health status or quality of life	66.7 (50.0-81.3)	66.7 (50.0-83.3)	0.82
Fatigue	33.3 (22.2-44.4)	33.3 (22.2-55.6)	0.58
Pain	16.7 (0-33.3)	16.7 (0-33.3)	0.89
Appetite	0 (0-33.3)	0 (0-33.3)	0.91
Financial worries	0 (0-25.0)	0 (0-8.3)	0.99
Dyspnoea	25.0 (16.7-41.7)	33.3 (25.0-58.3)	0.03
Cough	33.3 (33.3-66.7)	33.3 (33.3-66.7)	0.43
Haemoptysis	0	0	0.09
Peripheral neuropathy	0 (0-33.3)	0 (0-33.3)	0.45

*Mann-Whitney U test.

Table 2 Patient satisfaction at 3, 6, and 12 months after randomisation. Values are medians (interquartile ranges)

Item	Follow up		P value*
	Nurse led	Conventional	
Three months after randomisation:	(n=75)	(n=71)	
Organisation of care	81.3 (75.0-93.8)	71.9 (65.6-78.1)	<0.001
Information and advice	77.1 (69.8-89.6)	68.8 (58.3-75.0)	<0.001
Personal experience of care	77.3 (75.0-95.5)	75.0 (68.2-80.1)	0.002
Satisfaction with care	78.4 (61.6-100)	70.0 (51.1-79.5)	0.005
How would you rate support overall?†	93.0 (80.0-100)	78.0 (57.0-94.0)	0.002
Six months after randomisation:	(n=52)	(n=55)	
Organisation of care	83.3 (75.0-93.8)	75.0 (68.8-78.1)	<0.001
Information and advice	75.0 (67.9-85.4)	66.7 (58.0-75.0)	<0.001
Personal experience of care	79.5 (72.7-97.7)	75.0 (68.2-77.3)	0.001
Satisfaction with care	79.5 (65.9-98.3)	75.0 (58.7-89.2)	0.11
How would you rate support overall?†	89.0 (82.8-98.3)	83.0 (64.5-96.3)	0.04
Twelve months after randomisation:	(n=27)	(n=29)	
Organisation of care	81.3 (75.0-96.9)	75.0 (70.3-83.3)	0.01
Information and advice	75.0 (70.8-91.7)	68.8 (64.6-77.1)	0.01
Personal experience of care	79.5 (75.0-100)	75.0 (70.2-87.5)	0.03
Satisfaction with care	82.5 (72.7-100)	76.1 (64.2-85.8)	0.13
How would you rate support overall?†	93.0 (77.0-98.0)	81.5 (70.0-95.0)	0.08

*Mann-Whitney U test.

†Measured with a 100 mm visual analogue scale (range 0-100); high scores represented rating of support as good.

Table 3 Costs per patient by 3, 6, and 12 months after randomisation. Values are medians (interquartile ranges)

Time of follow up	Follow up		P value*
	Nurse led	Conventional	
Three months	(n=76)	(n=79)	
	221.50 (60.12-869.62)	288.50 (154.00-671.00)	0.18
Six months	(n=55)	(n=57)	
	369.50 (56.00-1432.00)	364.00 (154.00-1181.25)	0.40
Twelve months	(n=29)	(n=29)	
	696.50 (227.25-2318.75)	744.50 (298.00-2362.75)	0.66

*Mann-Whitney U test.

tion at baseline and at three, six, and 12 months.¹²⁻¹⁵ Secondary endpoints included overall survival, symptom-free survival, and progression-free survival. We collected data on use of services at three, six, and 12 months for analyses of patterns of use of services and cost effectiveness of nurse led follow up.

Economic analysis

We calculated costs of visits by general practitioners and nursing staff on the basis of information provided

by Netten and Curtis,¹⁶ calculated costs of hospital treatment with reference to standard costs reported by the Department of Health,¹⁷ and obtained costs of tests and procedures from Stevens et al.¹⁸ We used unit costs derived from these sources to calculate the total cost per patient for each period of follow up. All costs obtained were in sterling, related to 1999-2000, and were from a health and social care perspective.

Results

Participants and follow up

We approached a total of 271 patients to participate in the trial. Of these, 203 (75%) patients agreed to participate; 100 were randomly allocated to receive nurse led follow up (one was later excluded) and 103 to receive conventional medical follow up. Sixty eight patients (25%) declined to participate. Forty three (16%) eligible patients preferred to see a doctor; this indicated a high level of acceptance by patients of nurse led care. Most attrition was due to death or ill health.

Comparison between nurse led and conventional medical follow up

The mean age of patients in each group was 67 (SD 9, range 45-89) years; 140 patients (69%) were men. The clinical characteristics at baseline were similar between groups, as were scores for quality of life and patient satisfaction at baseline.

Three months after nurse led follow up began, patients rated their dyspnoea as less severe than did patients randomised to conventional medical follow up (table 1). No other statistically significant differences existed at this time or between the randomised groups at six months. At 12 months patients randomised to receive nurse led follow up had better median scores for emotional functioning (92 (interquartile range 67-100) v 67 (54-88)) and less peripheral neuropathy (0 v 0 (0-33)).

Satisfaction with care was generally high. At three months the patients who received nurse led follow up scored significantly higher in each subscale (table 2). At three months 53/75 (78%) of patients randomised to nurse led follow up said they would prefer nurse led care if asked to choose, but only 11/71 (17%) of patients who received conventional medical follow up would prefer to see a doctor only.

Seventy two patients (73%) receiving nurse led follow up died during the study and 69 (67%) of those receiving conventional medical follow up; median survival time was similar: 9.2 (95% confidence interval 6.2 to 12.1) months versus 10.4 (7.6 to 13.2) months (P=0.99). The median time to symptomatic progression was 6.0 (4.7 to 7.3) months in the nurse led follow up group and 10.2 (5.9 to 14.6) months in the conventional medical follow up group (P=0.01), and times to objective progression were 8.3 (5.5 to 12.2) months and 10.2 (5.9 to 14.5) months (P=0.47). Therefore, although no evidence showed a difference in objective progression, evidence showed that the nurses recorded symptomatic progression sooner than the doctors; these results are reassuring because they suggest that patients who received nurse led care were not at a disadvantage.

Patients receiving nurse led follow up had significantly fewer medical consultations with a hospital doctor at three months, had fewer radiographs taken (including chest radiographs) at three months and six months, and

were more likely to have had radiotherapy treatment at three months (see bmj.com). More patients who received nurse led follow up died at home rather than in a hospital or hospice: 29/72 (40%) patients randomised to nurse led follow up whose place of death was known compared with 14/62 (23%) patients randomised to conventional medical follow up ($P=0.04$). Patients who received nurse led care made no greater call on other professionals or services, and no significant difference in readmission rates was seen compared with those who received conventional medical follow up.

Comparison of the overall costs of care for the three periods of follow up showed no significant differences (table 3). The cost of the intervention itself was not included in the comparison, however, because accurate recording of the time spent by nurses and doctors on all patients was not feasible and separation of the elements of the cost of the nurses that related to the research from those that would be included in nurses' normal service was not possible. In the model used in this study, the cost of the nurses was around £150 per patient month of follow up.

Discussion

Our findings show that follow up of patients with lung cancer by clinical nurse specialists is safe, acceptable, and cost effective. Acceptability of the nurse led model of follow up was very high and compared favourably with the experience of Grunfeld et al (31% of breast cancer patients declined randomisation to general practitioner follow up).² Importantly, in our study, no patient in the nurse led follow up group accepted the offer to revert to conventional medical follow up at the end of the data collection period. On the basis of this study, we estimate that approximately half of patients with lung cancer would benefit from similar models of care after treatment.

Currently, although 50% or more of patients with terminal cancer express a preference to die at home, only 26% actually do.¹⁹⁻²² Forty per cent of patients in our study who received nurse led follow up died at home compared with 23% of patients who received conventional medical follow up. This compares favourably with a randomised study by Grande et al that evaluated a "hospital at home" service; the authors were unable to conclude that the service led to more patients dying at home.²³

Conclusions

The results of this study indicate that nurse led initiatives can be used to reconfigure care to make it more responsive to individual needs, increase patient satisfaction, and reduce the burden of hospital visits and investigations. Any increase in cost is likely to be modest. General practitioners were satisfied with the nurse led model of care.

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What is already known on this topic

Most patients with cancer are routinely seen in outpatient clinics for many years despite lack of evidence of effectiveness

Doctors and nurses often fail to detect patients' emotional distress, and patients have little time to raise concerns

What this study adds

Follow up of patients with lung cancer by clinical nurse specialists is safe, acceptable, and cost effective

Both patients and general practitioners were highly satisfied with the nurse led model of follow up

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