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Immediate reporting of chest X-rays referred from general practice by reporting radiographers: a single centre feasibility study

N. Woznitza [a,b,*], K. Piper [b], S. Rowe [a], A. Bhowmik [c]

[a] *Radiology Department, Homerton University Hospital, Homerton Row, London E9 6SR, UK*
[b] *School of Allied Health Professions, Canterbury Christ Church University, North Holmes Road, Canterbury CT1 1QU, UK*
[c] *Department of Respiratory Medicine, Homerton University Hospital, Homerton Row, London E9 6SR, UK*

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AIM: To investigate the feasibility of radiographer-led immediate reporting of chest radiographs (CXRs) referred from general practice.

MATERIALS AND METHODS: This 4-month feasibility study (November 2016 to March 2017) was carried out in a single radiology department at an acute general hospital. Comparison was made between CXRs that received an immediate and routine report to determine the number of lung cancers diagnosed, time to diagnosis of lung cancer, time to computed tomography (CT), and number of urgent referrals to respiratory medicine.

RESULTS: Forty of 186 sessions (22%) were covered by radiographer immediate reporting. Of the 1,687 CXRs referred from general practice, 558 (33.1%) received an immediate report (radiographer or radiologist). Twenty-two (of 36) CT examinations performed were following an abnormal CXR with an immediate report (mean 0.8 scans/week). Time from CXR to CT was shorter in the immediate report group (n=22 mean 0.9 days SD=2.3) compared to routine reporting (n=14; mean 6.5 SD=3.2; F=27.883, $p<0.0001$). Time to multidisciplinary team (MDT) discussion was shorter in the immediate reporting group (mean 4.1 SD=2.9) compared to routine reporting (mean 10.6; SD=4.5; F=11.59, $p<0.0001$). No apparent difference was found for time to discussion at treatment MDT.

CONCLUSION: It is feasible to introduce a radiographer-led immediate CXR reporting service. Patients can be taken off the lung cancer pathway sooner with the introduction of radiographer immediate reporting of CXRs and this may improve outcomes for patients. A definitive study assessing outcomes is required to determine whether this will have an impact mortality and morbidity for patients.

Introduction

Cancer is one of the most common causes of mortality, and lung cancer is the largest cause of cancer deaths.[1] When compared to other high-resource nations such as the USA, Europe, and Australia, England demonstrates lower survival

* Guarantor and correspondent: N. Woznitza, Radiology Department, Homerton University Hospital, Homerton Row, London E9 6SR, UK. Tel.: +44 (0) 208 510 7105.
E-mail address: nicholas.woznitza@nhs.net (N. Woznitza).

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for all cancer types and, in particular, lung cancer.[2] Worse outcomes for lung cancer, when compared to other common cancers, such as breast and bowel, is often due to late stage at diagnosis, which reduces treatment options.[3,4] The reason for late diagnosis is multifactorial: vague and non-specific symptoms, no current established screening programme, and higher prevalence in lower socioeconomic groups that often do not engage with health services.[5–7]

In order to address the late stage at diagnosis and improve outcomes, several initiatives are being implemented. Promising results were reported from the UK Lung Screening (UKLS) pilot study that examined lung cancer screening with low-dose computed tomography (CT) in high-risk patients.[8] Work is also being conducted to identify risk factors and high-risk patients in general practice,[5,9] and recent guidance has lowered the threshold for investigation of suspected cases of lung cancer.[10,11]

The Lung Cancer Clinical Expert Group published an optimal pathway for the diagnosis and treatment of lung cancer in 2016.[12] In order to improve outcomes, the pathway emphasised the need for early and accurate diagnosis, and proposed immediate reporting of chest radiographs (CXR) referred from general practice, with immediate CT of the chest for cases suspicious for malignancy. Streamlined diagnostics, with all radiology investigations performed and reported within 24 hours, was identified as a method of fast-tracking patients into the lung cancer pathway or giving patients a rapid non-cancer diagnosis.

A significant barrier to successful implementation of the optimal pathway is the ability of radiology departments to provide immediate CXR reporting and CT chest examinations. Diagnostic capacity is frequently cited as a barrier to improved cancer outcomes,[13,14] with significant reporting backlogs in England.[15,16] These delays have been exacerbated by sustained increases in imaging demand, and a scarcity of consultant radiologists. Radiographers that have completed accredited postgraduate education have been providing clinical reports for a range of imaging examinations as one method to increase capacity. This includes the reporting of skeletal radiographs,[17,18] magnetic resonance imaging (MRI) of knee and lumbar spine examinations[19,20] and, increasingly, CXRs,[21,22] and there is a growing evidence base to support this practice. The aim of this project was to perform a single-centre feasibility study on an immediate CXR reporting service, by radiographers, for patients referred from general practice.

Materials and methods

This project was an evaluation of a new service, and as such ethical approval was not required. The primary outcome was to establish the feasibility of immediate reporting, in terms of resource requirement assessment and practical limitations. The number of CXR reports provided by each practitioner was retrieved from the Radiology Information System (RIS; 2016–2017). Secondary outcomes were the number of lung cancers diagnosed, the time to diagnosis of lung cancer (including intermediate time points; time to CT, time to diagnostic multidisciplinary team [MDT]), and the number of urgent referrals to respiratory medicine. All timing (time to CT, time to diagnostic MDT) was measured in days, including weekends, not working days. Comparisons were made for urgent respiratory referrals that received an immediate CXR report and those that received a routine report. Patients with a non-cancer CXR report and that had a CT performed by respiratory medicine were stratified by timing of the CXR report (immediate or routine) to explore if there was a difference in the proportion of patients referred for additional investigations in secondary care. Descriptive statistics, including mean, standard deviation (SD), and median and interquartile range (IQR), were calculated. One-way *t*-test, analysis of variance (ANOVA) and Fisher's exact test were used to identify trends (SPSS version 22).

Department demographics

The feasibility study was conducted at Homerton University Hospital, an acute district general hospital in London, UK. This imaging department performs approximately 173,000 examinations per year, 88,900 radiography examinations, of which 5,100 are adult CXRs referred from general practice (2016–2017). Homerton University Hospital has an established team of advanced (n=6) and consultant (n=1) radiographers. At the time of the feasibility study, only one reporting radiographer was providing CXR reports in clinical practice. A further two radiographers had recently completed accredited postgraduate education and were undertaking a period of double reporting. The department provides a walk-in GP radiography service between 8:00–17.00 Monday to Friday. For the purposes of the present study, a session was defined as a half day (4.5 hours) between 8:00–12:30 or 12:30–17:00.

Reporting radiographer

CXRs from general practice were reported by a single radiographer, who completed a postgraduate certificate in adult CXR reporting in 2010 and is an accredited consultant radiographer with the College of Radiographers. The radiographer reports 8,000 adult CXRs per year, is an active member of the respiratory MDT and has been discussing abnormal CXRs with patients on an ad-hoc basis for 3 years after completion of advanced communication skills training.

Implementation of immediate CXRs referred from general practice

The study was conducted between November 2016 and March 2017. All adult (>16 years) CXRs referred from general practice during an immediate reporting session received a report prior to the patient leaving the department. CXRs that were suspicious for lung cancer were discussed with a consultant radiologist, who requested the CT examination. The reporting radiographer informed the patient, explained the findings, and an immediate CT examination of the chest was offered. Results of the CT examination were fast-tracked and made available to the

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