

Protocols and guidelines for mobile chest radiography in Irish public hospitals



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ABSTRACT

Background: The mobile chest radiograph is a highly variable examination, in both technique and setting. Protocols and guidelines are one method by which examinations can be standardised, and provide information when one is unsure how to proceed. This study was undertaken to investigate the existence of protocols and guidelines available for the mobile chest radiograph, to establish their nature and compare them under a variety of headings.

Methodology: A postal survey was administered to the Radiography Service Managers in the public hospitals under the governance of the Health Service Executive (HSE) in Ireland. The survey contained questions regarding hospital demographics, contents of existing protocols or guidelines, and why a protocol or guideline was not in place, if this was the case.

Results: The response rate to the survey was 62% ($n = 24$). Those that had a specific protocol in place amounted to 63% ($n = 15$), 71% ($n = 17$) had a specific guideline, and 63% ($n = 15$) had both. Twenty nine percent ($n = 7$) had no specific protocol/guideline in place. Scientific research (88%, $n = 15$) and radiographer experience (82%, $n = 14$) were the most common sources used to inform protocols and guidelines.

Conclusions: There are protocols and guidelines available to radiographers for mobile chest radiography in the majority of public hospitals in Ireland. The nature of the protocols and guidelines generally coincides with the HSE guidance regarding what sources of information should be used and how often they should be updated.

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Introduction

As the governing body of healthcare in Ireland, the Health Service Executive¹ (HSE) define a protocol as “a written plan that specifies procedures to be followed in defined situations”. The HSE¹ offer a definition of a guideline as being “a principle or criterion that guides or directs action”, whose development is based on written evidence, and not solely on expert opinion. While differing perhaps in nature and content, ultimately both of these definitions outline the expected standard of care that a user should provide, and that a patient should receive.

The benefits of having effective, up-to-date clinical protocols or guidelines in place are numerous for both the user and the patient. Statutory Instrument (S.I.) 478,² which was enacted in Ireland in order to implement Council Directive 97/43/Euratom, states that

written protocols are necessary for every type of “standard radiological practice”, and further states that they should be implemented to prevent any accidental exposures.

The mobile chest x-ray is a variable procedure in both technique and setting. Research³ has shown that a reliance on tradition and subjective experience, as well as the presence of unwritten rules and assumptions, are a prominent occurrence in the radiography profession. One need only look to the patient positioning of a mobile chest x-ray to see this. The anteroposterior (AP) position is the most common position for mobile chest x-ray in the Intensive Care Unit (ICU).⁴ This however, may lead to difficulties in diagnosis, such as a 15%–20% magnification of the heart shadow.⁵ A protocol encouraging the use of the posteroanterior (PA) position could not only improve the accuracy of the evaluation of the heart, but could also reduce the radiation dose to the breast tissue, and may be possible on patients in a less serious state in a hospital ward.⁶ Therefore, a protocol or guideline can be a very useful tool to standardise practice.¹ For example, a study by Le Blanc et al.⁷ demonstrated that the use of medical protocols in the ICU has led

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to reduced costs, shortened patient stays and overall improved patient outcomes.

There is a danger that protocols can be too restrictive, which may prevent radiographers from using their clinical expertise,⁸ or deprive them of important clinical experiences while training.⁹ In order to prevent misuse, protocols and guidelines should allow “latitude for professional judgment”.¹⁰

Protocols and guidelines should be based on solid evidence, which could include peer reviewed material, national standards and peer practice.¹¹ The HSE¹ recommend that protocols and guidelines be updated every two years. The Irish Medical Council¹⁰ suggests that a protocol, where possible, should be written for each examination, (e.g. each individual projection), each machine (e.g. each x-ray room or mobile machine), and include specifics for exposure factors. While some studies¹¹ suggest that protocols should be documented in paper form, a review by Chaundry et al.¹² discovered that the use of health information technology can increase adherence to guideline- and protocol-based care.

This article investigates the existence of protocols and guidelines for mobile chest radiography in public hospitals in Ireland, including both their management and content.

Method

A postal survey was conducted of Radiography Service Managers (RSMs) regarding protocols and guidelines for mobile chest radiography in their departments. Acute care hospitals under the governance of the HSE were chosen as the study population. There were fifty hospitals in total. Two hospitals were excluded from the study, as the researcher made contact with them early in the research process, therefore contaminating the population. Furthermore, five speciality hospitals, such as paediatric hospitals, were also excluded from the study, as adult mobile chest radiography would not be a routine examination here. A pilot study using four hospitals was carried out to ensure that the questionnaire was clear and unambiguous. Feedback from the pilot study informed improvements in the questionnaire design, such as the inclusion of more demographic questions. There were thirty nine hospitals in the main study, as the hospitals in the pilot study were not included.

The questionnaire was in three sections. Each section had a theme, and contained specific instructions relative to that section. Most were closed questions regarding hospital demographics, contents of the existing protocol or guideline, and their management. There was extra space for comment if the appropriate answer was not listed. Some open ended questions featured towards the end of the survey, but only had to be filled out if no protocol or guideline of any sort addressed the mobile radiography examination. For the main study, a return date of two weeks was requested. In an attempt to increase responses, a self addressed envelope was included with the original questionnaire,¹³ and a reminder letter requesting survey return was sent to the RSMs after one week.

Data were analysed using SPSS (Statistics Package for the Social Sciences) software, with results of statistical analyses considered to be statistically significant where $p \leq 0.05$. Simple thematic analysis was necessary to analyse the extra information provided by respondents on the multiple choice questions. Non parametric statistical testing was used as the sample size was small.¹⁴

Results

The study had a valid response rate of 62% ($n = 24$). The frequencies for the existence of protocols and guidelines demonstrated in Fig. 1. No respondent reported having only a specific protocol in place. Sixty three percent ($n = 15$) reported having both a protocol and a guideline. Spearman's correlation generated a

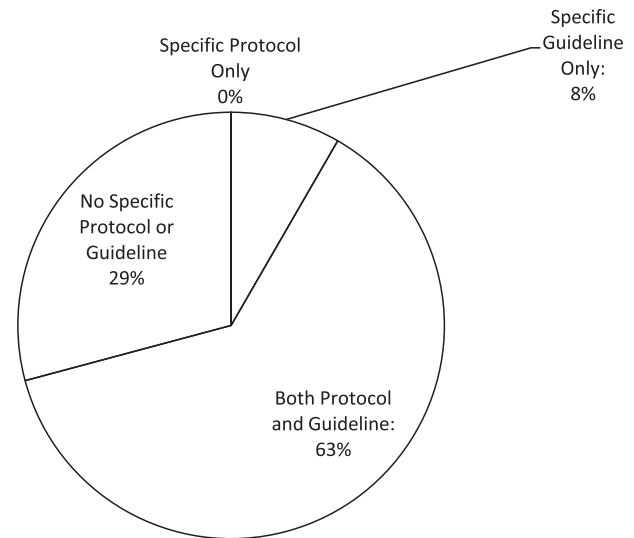


Figure 1. Existence of protocols and guidelines.

correlation co-efficient of 0.828, indicating a strong relationship between the presence of a protocol and the presence of a guideline. This relationship was found to be highly statistically significant with $p = 0.001$.

Out of the seven hospitals that had no specific protocol or guideline in place for mobile chest radiography, 71% ($n = 5$) addressed the mobile chest radiography examination in other documentation, including Local Radiation Safety Rules, Radiology Department Protocols, Radiation Safety/Protection Procedures and Operation Policy for Mobile Operations. These seven respondents were then excluded from all further analysis.

The information sources used in the writing of the protocols and guidelines are outlined in Table 1. Spearman's correlation revealed that no statistically significant relationships exist between the frequency of update and any options presented by the researcher regarding sources of protocol/guideline information. The p values of the relationship between these options and frequency of update are as follows: use of scientific research as a source of information ($p = 0.233$), the use of radiographer experience ($p = 0.072$) and the use of manufacturer recommendations ($p = 0.544$).

The frequency of review and update of the protocols and guidelines are seen in Fig. 2. This is followed by the areas used to store protocols and guidelines (Table 2) and the methods specified in protocols/guidelines by respondents to protect the radiographer and patient from the effects of ionising radiation (Table 3).

Only 35% ($n = 6$) of the protocols/guidelines addressed patient positioning. They all recommended the AP position for the

Table 1

Information sources for the writing of protocols and guidelines ($n = 17$).

Basis	Frequency
Scientific research	88% ($n = 15$)
Radiographer experience	82% ($n = 14$)
Manufacturer recommendations	39% ($n = 5$)
Professional guidelines ^a	24% ($n = 4$)
Legislation ^a	18% ($n = 3$)
Internal audits ^a	6% ($n = 1$)
Radiologist opinion ^a	6% ($n = 1$)

Respondents did not specify which legislation they used, but one cited HSE guidelines as a source. Professional guidelines included IIRRT guidelines, RCR guidelines, and RPII guidelines.

^a Provided under “other” option in survey, and presented here following a simple thematic analysis.

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