The Radiographer’s impact on improving Clinical Decision-making, Patient Care and Patient Diagnosis: A pilot study

Daniel Lam,1 Ingrid Egan2 and Marilyn Baird3

ABSTRACT

AIM: This pilot study attempts to quantify the benefits of a documented radiographic clinical history through the use of the clinical history template form designed by Egan and Baird.1

METHOD: Six radiographers completed the clinical history template for 40 patients and four radiologists included the recorded information as part of their reporting process. A focus discussion group was held between the radiographers to ascertain the level of satisfaction and benefits encountered with the use of the template form. A questionnaire was designed for the radiologists to complete regarding the usefulness of the template form with respect to the radiological reporting process.

RESULTS/DISCUSSION: 15 cases for which the form was used demonstrated a direct benefit in respect to improved radiographic clinical decision-making. Radiographers agreed the form aided the establishment of a stronger radiographer-patient relationship during the radiographic examination. Two radiologists agreed the form aided in establishing a radiological diagnosis and suggested the form be implemented as part of the standard departmental protocol.

CONCLUSION: Despite the small sample size, there is evidence the form aided radiographic decision-making and assisted in the establishment of an accurate radiological diagnosis. The overall consensus amongst radiographers was that it enhanced radiographer-patient communication and improved the level of patient care.

Key words: patient care, clinical history documentation, radiographic clinical decision-making, radiological reporting, radiographer-patient relationship.

INTRODUCTION

Patient care and advocacy has always been an integral part of the radiography profession. According to the American Registry of Radiologic Technologists (ARRT) Code of Ethics,2 radiographers should “conduct themselves in a professional manner, responding to patient needs and supporting colleagues and associates in providing quality patient care.” The Australian Institute of Radiography (AIR) Code of Practice for Radiographers also supports this notion in stating that radiographers “are personally accountable for their work and professional conduct” with their “prime concern being for the welfare and safety of patients, staff and the public.”3 However, for too long in Australia, radiographers have narrowly interpreted patient care as only something performed once the radiographic examination is underway.4,5 As the experience in the United Kingdom has shown, increasing the level of patient care through an expansion to the traditional role of the radiographer has resulted in radiographers performing a wide variety of contrast examinations and writing radiographic reports.11,12,13 Even in the United States the profession is recognising the important role radiographers can play in clinical decision making through the creation of the Radiology Assistant as described by Reid, et al.10

Without doubt the successful implementation of any form of advanced radiographic practice is contingent upon the radiographer having accurate patient data.1 More than ever all radiographers need written documentation upon which to justify their decisions, ensure all medico-legal requirements have been attended and to reduce the possibility of errors.

Taking a Radiographic Clinical History

Firstly, correct patient identification must be obtained before the examination begins. Once this has been determined, the patient’s clinical history may be taken. Radiographic clinical history taking involves obtaining clinical information from a patient regarding the patient’s medical condition during the examination may or may not be beneficial towards the radiographic examination process itself, and that may aid in establishing a suitable diagnosis. Support for this process can be found again within the ARRT Code of Ethics which states radiographers should “act as agents through observation and communication to obtain pertinent information for the physician to aid in the diagnosis and treatment management of the patient.” However in order to achieve this objective a good rapport with the patient must be established.12,13

Before the process commences, it is imperative radiographers first introduce themselves to the patient and give a brief yet thorough explanation of the examination.13 Once patient...
consent has been gained, clinical history may then be obtained. The documentation of a clinical history should be viewed as an interview with the patient, throughout which professional conduct and effective history taking skills should be displayed. The radiographer should respect the patient at all times, be genuine in nature, and empathise with the patient’s condition. Failure to exhibit any of these qualities will result in a loss of faith between the radiographer and the patient with the possible consequence being a withholding of information by the patient.

Effective methods of clinical history taking include good questioning skills. This involves the use of open-ended and closed-ended questions, probing questions, facilitation of discussion, and silence to allow time for the patient to think about the question. Good listening and observational skills are also vital components within the clinical history taking process.

The most important aspect of clinical history taking involves the acquisition of the patient data itself. Spending a couple of minutes asking relevant questions in order to obtain clinical information from the patient is usually part of the radiographer’s duty of care. It is crucial that an objective approach to the collection of subjective data is implemented, with everything that the patient says to be taken into context and not disregarded.

The Clinical History Template Form

Egan and Baird previously suggested a clinical history template form for obtaining extra clinical information from the patient during a radiographic examination. It is this template form that was used as part of the research project.

Five key areas of interview are addressed within the clinical history template form:

(i) **Area and type of symptoms**
This part of the form involves identifying the region(s) of interest and describing the symptoms experienced by the patient. It includes a body chart for illustrating the areas in which the patient experienced pain (both localised and referred) and a pain scale for indicating the degree of pain perceived by the patient.

(ii) **Current history**
Relevant clinical history relating to the patient’s current referred condition, which is not already included on the radiological request form needs to be obtained. The information required includes the nature and behaviour of the patient’s symptoms, mechanisms of injury (especially for trauma cases) and physical activities that aggravate or alleviate the symptoms.

(iii) **Past history**
Here information is elicited from the patient regarding previous medical imaging, surgery or treatments of relevance to the current examination. Patients are also asked if they have had a similar occurrence of the current medical condition in the past.

(iv) **Psychosocial/occupational history**
This section is used to determine the cause and nature of the patient’s medical condition. It involves acquiring information relating to the patient’s occupation, social and leisure activities and home activities.

(v) **Additional relevant patient information**
Under this heading, the radiographer notes extra information from the patient that may be of relevance and value towards the radiographic examination or radiological reporting, which the patient provided during the examination.

METHOD

The aim of the pilot study was to quantify the clinical value of the clinical history template form with respect to improving:
1. radiographic clinical decision-making,
2. radiological reporting, and
3. patient care.

1. **The clinical trial**
Prior to commencement of the pilot study, ethics approval was obtained from Monash University. A six-day clinical trial was conducted in the general radiography department of a Melbourne metropolitan teaching hospital. Six radiographers volunteered to be involved in the study: one senior radiographer of more than twenty years post-qualification and five radiographers of between one and three years post-qualification. Four radiologists were also involved in the study: two senior consultants and two registrars. Forty casualty patients were selected at random as the sample population in the trial. The selected patients were of varying age, ranging from eight years to ninety-six years of age. They were all required to either be physically, mentally and psychologically capable of providing clinical information adequate and relevant to the clinical history template form, or otherwise have a family member/guardian present to do so. There were an almost equal proportion of male and female patients presenting for a wide variety of general radiographic examinations.

2. **Pre-trial Briefing**
At the beginning of the clinical trial, a meeting was held with the six radiographers to discuss the outline and purpose of the research study. A brief overview of the clinical history template form was given and the proposed method of interviewing the patient was discussed. Particular emphasis was placed on ensuring that the completed template forms were attached to the back of the radiological request forms before being sent for reporting. Radiographers were instructed to comment on the adequacy of current clinical histories and then assess the template’s effect on clinical decisions made during the medical imaging procedure. A meeting was also held with the four radiologists involved in the study to discuss the purpose of the clinical trial and the template form.

3. **Clinical History Documentation Trial**
The clinical history template form was trialed on 40 randomly selected casualty patients who presented for general radiography examinations during the afternoon shift over a period of two weeks. The clinical notes on the radiological request forms were recorded in a logbook and numbered. No other patient details were recorded thus ensuring that patient confidentiality was kept at all times. The time taken to obtain patient information for the template form was also recorded for each case in the logbook.

After completion, the template forms were numbered, so that they could be correlated with the clinical notes on the request form. The template forms were then attached to the back of the radiological request forms and sent in for reporting by the radiologists, who incorporated the information into the reporting process. After each of the patient’s films had been reported, the template form was detached from the radiological request form and placed in a box to be analysed at the end of the clinical trial.

4. **Focus Group Meeting**
At the end of the clinical trial period, a focus group meeting was conducted with the six radiographers involved in the
study to ascertain their level of satisfaction and overall opinion regarding the clinical value of the template form. In particular, radiographers were asked their assessment of the forms value with respect to enhancing radiographic clinical decision-making and radiographer-patient communication. The radiographers' opinions for each of these categories were noted in the logbook, whilst withholding the names of the radiographers involved.

5. Radiologist Questionnaire
A short questionnaire was designed for the four radiologists involved in the study to complete. This questionnaire comprised four questions:
(i) Did the clinical history template form aid in the establishment of a diagnosis?
(ii) Did the template form accelerate the rate of reporting?
(iii) Would you like to see the template form implemented as part of radiological departmental protocol in the future?
(iv) Are there any suggestions for changes/improvements to the template form?

After completion, the anonymous questionnaire forms were placed in a box to be analysed at the end of the clinical trial.

RESULTS
1. Number of inadequate requests
The first set of data on adequacy of current clinical history was tabulated for the six radiographers. Two major categories emerged in this data set:
1. Insufficient patient notes
2. Illegible patient notes.
Four request forms (10%) comprised insufficient clinical notes and four other request forms (10%) comprised clinical notes that were illegible.

2. Number of requests benefiting from radiographer supplementation
Overall, 15 of the clinical history template forms (38%) were categorised as being beneficial to the medical imaging procedure. This consisted of seven cases (18%) in which clinical information obtained on the template form influenced a change in the radiographic procedure, as well as eight cases involving insufficient/illegible clinical notes on x-ray request forms. Figure 1 illustrates these findings.

3. Average time taken to conclude the patient interview
During the radiographic examinations, an average time of between two to three minutes was taken to obtain sufficient patient clinical information for the template form. This was done at the beginning of the radiographic examination in order to facilitate radiographic clinical decision-making by ascertaining the best way to approach the examination and minimising errors made in interpretation of clinical request forms and in choosing correct radiographic imaging techniques. All of the radiographers agreed that the time taken in acquiring extra clinical information from the patient was not a major issue.

4. Focus group results: the radiographers
Two radiographers found the clinical history template form aided in radiographic clinical decision-making in most cases, whilst the remaining radiographers found the template form to be beneficial only in some cases. However, all radiographers agreed with the fact that the template form served as a useful means of establishing a stronger radiographer-patient relationship during the radiographic examination, by encouraging communication between the radiographer and the patient.

5. Questionnaire results: radiologists.
Two radiologists agreed the clinical history template form contributed to establishing a suitable diagnosis in the majority of the cases. The remaining radiologists disagreed. These were senior radiology consultants. One radiologist believed that the template form helped speed up the rate of reporting, whilst the remaining three radiologists believed that it slowed down the rate of reporting. Two radiologists believed the template form should be implemented as part of departmental protocol in the future. One went as far as to suggest the addition of another section to check if the patient had had clinical criteria for their medical injuries completed prior to arrival for their x-ray examination.

DISCUSSION
A significant percentage of medical imaging cases were found to have insufficient/illegible patient data. There were insufficient or illegible clinical notes on the radiological request forms for eight patients (20%). For each of these radiographic examinations, more accurate clinical information was obtained from the patient and noted on the clinical history template form. This information also provided the radiographer with a clearer understanding of the patient's medical condition and was therefore beneficial in influencing the radiographic clinical decision-making process. Although none of the 40 clinical cases involved incorrect clinical notes or imaging requests on the clinical request forms, this occurrence has been reported anecdotally and if a larger sample size has been used, this factor may have emerged in the study. (i.e. wrong side of the body requested/inappropriate body region requested/unnecessary repeat imaging)

Use of the clinical history template form certainly places more responsibility upon the radiographer in adapting radiographic practice to best meet the patient's clinical indications. If, after consulting the referring practitioner or radiologist, the decision to alter the requested radiographic procedure is approved, any...
The Radiographer’s impact on improving clinical decision-making, patient care and patient diagnosis: a pilot study

Table 1: The clinical value in implementing the clinical history template form as part of the radiographic examination

<table>
<thead>
<tr>
<th>Patient Gender: Female</th>
<th>Patient Age: 74</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical notes on request form:</td>
<td>X-ray Lumbo-sacral spine Low back pain &amp; sciatic pain</td>
</tr>
</tbody>
</table>

NOTES OBTAINED ON CLINICAL HISTORY TEMPLATE FORM

(i) Area & type of symptoms:
- Lower back pain
- Referred pelvic pain, especially around buttock region

(ii) Current History:
- Continuous lower back pain, gradually worsening over the past 2 weeks
- Pain comes on only during movement

(iii) Past History:
- No previous back complaints or problems

(iv) Psychosocial/Occupational History
- Patient used to be a nurse

(v) Additional Clinical Information:
- Patient has osteoporosis

(vi) In what ways has the recording of these notes affected the radiographic examination?
- Performed PA lumbar spine and PA L5/S1 projections instead of AP projections as a result of severe patient discomfort due to lower back and buttock pain (improved SI joint and L5S1 visualisation was also achieved)
- Performed an additional radiographic projection of the pelvis (AP) after finding out the patient had pelvic and buttock pain
- Decreased the radiographic exposure after finding out the patient had osteoporosis
- Was able to use medical terminology while explaining the procedure to the patient after finding out that the patient used to be a nurse.

Introduction

Medico-legal ramifications related to the radiographic clinical decision-making is now primarily placed upon the referring practitioner or radiologist. Conversely, a radiographer who has additional relevant knowledge of the patient and fails to report this could be seen as not providing effective “patient advocacy” or effective communication. Thus radiographers should be seen as providing essential medico-legal requirements and assisting in the prevention of errors due to misrepresentation or misinterpretation of the patient’s clinical history. Problems involving incorrect, unnecessary or excessive radiographic projections taken by radiographers may be minimised and avoided in most instances through use of the template form.

In the seven cases (18% of the sample size) in which the clinical information obtained on the template form led to a change in the radiographic procedure these changes comprised either alteration to the radiographic exposure or additional and/or modified radiographic projections being selected. It is clear from the results obtained that additional clinical information obtained from the patient aided the radiographer in their clinical decision-making process.

Table 1 above represents an example of the clinical value in implementing the clinical history template form as part of the radiographic procedure.

Radiographers perceptions of the value of the Form

Four radiographers found that the clinical history template form was beneficial in terms of aiding the radiographic clinical decision-making process in some of the cases. The use of the form prompted the radiographers to ask more questions in order to find out more clinical details from the patient. All the radiographers involved in the study believed the process enhanced radiographer–patient communication and improved the level of patient care provided by the radiographers. One radiographer claimed that applying the clinical history template form in the radiographic examinations allowed her to “get to know the patient a lot better”. Indeed, as evidenced by the following comments from patients, “nobody ever spent time asking me questions” and “I would love it if you asked me questions relating to my condition”, the form proved useful in reminding radiographers that establishing patient rapport is as vital as the actual radiographic technique. Further, given many elderly patients tend to perceive physicians as busy authoritative figures, radiographers may play an important role in documenting clinical information from patients, as they are usually perceived to be less threatening and easier to talk to than physicians.

In cases involving more serious injuries or trauma, a more efficient interview was performed using closed-ended questions. In some situations, responses were unable to be obtained from the patient due to their clinical condition, hence observational skills coupled with acquisition of clinical information relating to the patient from family members or nursing staff in the x-ray room were required.

The role of the clinical history documentation process in improving patient care and clinical diagnosis

A major benefit in implementing the clinical history template form as part of radiological departmental protocol is the potential for radiologists to be provided with a more “complete” picture of the patient’s condition. Although use of the form may slow down the rate of reporting in some cases, the benefits of enabling a more accurate patient diagnosis and reducing the amount of repeat radiography and patient recalls for further imaging is much more critical in the long-term.

Table 2: The advantages and disadvantages of the clinical history template form

<table>
<thead>
<tr>
<th>Advantages of Clinical History Template Form</th>
<th>Disadvantages of Clinical History Template Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>- aided radiographic clinical decision-making in cases where there was insufficient or illegible clinical notes on radiological request forms</td>
<td>- some of the questions were already deemed to be routinely asked by radiographers during radiographic examinations (verbally/extra time needed to fill out the template forms, thereby slowing down the radiographic examination)</td>
</tr>
<tr>
<td>- greater degree of radiographer-patient communication</td>
<td></td>
</tr>
<tr>
<td>- enhanced level of patient care</td>
<td></td>
</tr>
<tr>
<td>- evidence that it aided establishment of a radiological diagnosis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- slowed the rate of reporting for some cases</td>
</tr>
</tbody>
</table>
The clinical history template form used in this pilot study was implemented as part of radiological departmental protocol and the relative clinical advantages and disadvantages of the template form were assessed. Table 2 outlines the advantages and disadvantages of the template form.

As illustrated in Table 2, the benefits of implementing a clinical history template form as part of standard radiological departmental protocol outweigh its drawbacks. One of the major advantages of the use of the template form in the clinical setting is improving the level of patient care. Spending an extra minute or two to ascertain further clinical information from the patient that is of relevance to the clinical question at hand may play a major role in enhancing the patient’s wellbeing in the future. No matter how busy the department might be, attention to patient care and consideration of their presentation and clinical history should not be compromised. Since the time taken to document the outcome of a patient interview is minimal, the template form may even be included as standard departmental protocol in a busy radiographic clinical setting. Simplifications can be made to the template form to increase the efficiency of its use in radiological examinations.

CONCLUSION

The analysis of inadequate clinical history documentation (insufficient or illegible clinical notes) was determined to be 20 per cent in this study. The effects of supplementation of patient data by radiographers demonstrated a further 18 per cent of cases that benefited from the increased patient data. This gave a net benefit in 38 per cent of cases in the pilot study. Clinical history documentation is an integral part of radiographic practice, yet it is a process often undertaken lightly and mostly conducted verbally by radiographers. With the adoption of an improved method of clinical history documentation by radiographers, radiographic clinical decision-making, patient care and patient diagnosis may be greatly enhanced. Increased emphasis should be placed upon clinical history taking skills and patient interviewing techniques in radiography tertiary studies and in the workplace. With formalised clinical history documentation, radiographers will have a better opportunity to raise their professional profile, improve communication in the health care team, improve workplace satisfaction and improve the overall standard of practice.¹

In respect to this pilot study, there were many limitations and these included:
- small sample size
- limited number of radiographers and radiologists participating in the study
- study undertaken at one clinical centre only
- only casualty patients included in study sample
- subjective nature of the study.

Suggested recommendations for future research include:
- larger sample size and greater number of radiographers and radiologists involved in the study, for increased range and accuracy of results
- study to be performed at more than one clinical centre, for comparison of results
- inclusion of outpatients and other modalities in study sample.

Finally, given the widespread implementation of computed radiography and digital radiography, the authors suggest that these systems should have Radiographic Clinical History software incorporated with the electronic request.

ACKNOWLEDGEMENTS

The authors thank Dr John de Campo, Director of Diagnostic Imaging at Monash Medical Centre, Clayton, Victoria for permission to conduct this survey in the department.

Appreciation is also expressed to the radiography and radiology staff in the Department of Diagnostic Imaging at Monash Medical Centre for their willing participation in the pilot study.

REFERENCES


Peer reviewed
Submitted: June 2004
Accepted: October 2004