

Need for Image Reporting by Radiographers in Zambia

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ABSTRACT

There is a critical shortage of radiologists in Zambia, with only 5 serving the entire population of approximately 17 million. For this reason, most hospitals, especially in rural areas have no radiologist services. This leaves most diagnostic imaging examinations unreported. In order to bring imaging services closer to the families who stand as a point of care, this article addresses the ways and possibilities of having reporting radiographers assisting radiologists in reporting on plain film radiographs. It has further evaluated evidence and research on how this undertaking has worked well in other countries. The article ends by recognising that with postgraduate training in image interpretation and reporting, radiographers (both diploma and degree holders) in Zambia can effectively report on plain film radiographs; thereby improving access to this service for the majority of patients.

INTRODUCTION

A reporting radiographer is, for the purpose of this article, defined as a healthcare professional holding a diploma or degree in radiography who has undergone postgraduate training in image interpretation and reporting. Traditionally, the role of a radiographer in the diagnostic pathway was restricted to producing images for the radiologist to report. This radiography practice has changed in

countries, such as the UK, USA, Australia and, more recently, in Uganda.^[1-4] Radiographers have taken up the role of film reporting which traditionally was solely the role of a radiologist. This change was initiated due to a shortage of radiologists in these countries. Zambia is also experiencing similar, if not worse, problems than countries where reporting radiographers was found to be need driven. In Zambia, there are currently 5 radiologists working in public hospitals servicing a population of approximately 17 million, representing a ratio of 1: 3,400,000. This problem has been acknowledged in the National Health Strategic Plan of 2017-2021 as a hindrance to the provision of quality healthcare services and in ensuring universal health coverage in Zambia.^[5] The Radiological Society of Zambia (RSZ) is concerned about this challenge and discussions have been taking place within the radiography profession on how to extend the role of a radiographer to include image reporting.

Practice and Accuracy of Image Interpretation by Radiographers

The extended role of a radiographer to report on plain film radiographs was first introduced in the UK. This was necessitated by a shortage of radiologists and a trebling workload due to increased demand of diagnostic imaging services. In 1971, Dr Swinburne, a radiologist, first raised the possibility of extending the role of a radiographer to incorporate image interpretation.^[6] However, bringing on board reporting radiographers created a

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lot of opposition from other radiologists and medical professions. It was argued that radiographers do not have the medical background to accurately interpret plain radiographs. But this view changed when a study conducted by Berman et al.,^[7] found radiographers better at image interpretation than casualty medical doctors. It was also found that radiographers' knowledge and skills improve after undertaking specialised training in this area^[8, 9] and that image interpretation by casualty medical doctors increased the risk of misinterpretation, incorrect treatment and the effect of medical errors.^[7,10] This led to the change of scope of practice of radiographers by introducing a Red Dot System, where a radiographer communicates to the referring medical practitioner that an image potentially contains an abnormality by affixing a small red circular sticker on a radiograph. However, this initiative has not proven to be very effective because it does not indicate the site and significance of the injury or abnormality. For this reason, further research was conducted which found that trained reporting radiographers can provide diagnostic reports at a level comparable to radiologists.^[8,9] Several research studies have been conducted on this subject and radiographer reporting is now well established in the UK. According to the College of Radiographers,^[11] about 16 universities across the UK are offering image interpretation and reporting courses.

In Africa, the first formal discussion for the possibility of radiographers' role-extension in image reporting occurred during the radiology conference held in South Africa in 2006.^[11] Delegates highlighted the negative impact the shortage of radiologists in most African countries had on the delivery of imaging services. Radiologists recognised the need to use the services of radiographers at full potential by allowing trained radiographers to give formal written reports on plain film radiographs. The literature search revealed that Uganda is the first country in Africa to have introduced reporting radiographers and this was pioneered by Professor Kawooya due to a lack of

radiologists in that country. Currently, there are 70 radiologists working in Uganda serving a population of 44 million.^[12] In order to mitigate this problem, Ernest Cook Ultrasound and Education Institute (ECUREI) developed a one-year plain film interpretation training programme^[4] and twenty-five radiographers have so far been trained and undertake plain film reporting.^[13] In South Africa, there are currently no reporting radiographers. However, the Health Professions Council of South Africa (HPCSA) is currently reviewing the regulations to include formal reporting in the scope of practice of radiographers.^[14] This means that radiographers in South Africa may soon start reporting on plain film radiographs. Discussions on this issue are also taking place in other African countries which have a shortage of radiologists, such as Nigeria and Kenya.^[13,15]

There is scarcity of literature on this subject in Africa. Limited research has been conducted in South Africa and Nigeria on the ability of radiographers to interpret plain film radiographs. A study conducted in South Africa by Hazell et al.,^[16] found that radiographers' accuracy in reporting on plain film radiographs improved after undertaking training from 71.04% to 78%, sensitivity increased from 83.73% to 87.25% and specificity increased from 59.62% to 70.34%. Another study conducted in South Africa by Du Plessis and Pitcher,^[17] compared the accuracy of acute trauma-radiographs reporting by medical doctors and radiographers. Radiographers achieved significantly higher reporting accuracy and sensitivity than medical doctors (81.5% vs 67.8%). Another similar study was conducted in Nigeria by Ekpo et al.,^[15] to assess the performance of radiographers in interpretation of plain chest radiographs without specialised training, which revealed a mean sensitivity of 76.9% and a specificity of 79.8%. These studies show that radiographers have got an inherent ability to identify abnormalities on plain film radiographs and this improves after undertaking specialised training in image interpretation.

In Zambia, since the 1980s, radiographers have been performing and reporting on ultrasound examinations. There is also evidence that Zambian radiographers with appropriate education and training can report on plain film radiographs. A study conducted in Zambia by Munsanje,^[18] revealed that training in image interpretation could enable radiographers to improve their accuracy and ability to provide a descriptive written diagnostic report. Radiographers are usually consulted by referring medical practitioners (medical doctors, clinical licentiate officers and clinical officers) on image interpretation, even though the scope of practice prohibits expression of that knowledge in the form of a written diagnostic report. There are also few Zambian radiographers working in the UK who have undertaken training in image interpretation and are currently reporting on diagnostic imaging examinations. This reflects the potential for the development of the role of reporting radiographers in Zambia.

Current Reporting of Diagnostic Imaging Examinations in Zambia

In the Zambian healthcare system, diagnostic imaging services were introduced in the early 1930s, initially providing general radiography services only.^[19] Over the years, other services have gradually been introduced, such as ultrasonography (US), computed tomography (CT), nuclear medicine (NM), dual-energy X-ray absorptiometry (DEXA), mammography, and magnetic resonance imaging (MRI). This has resulted in the attraction of radiologists towards these specialised tasks, leaving the interpretation of plain radiographs to the referring medical practitioners. Radiologists only report on plain film radiographs upon special request.^[20] It should be mentioned that all the radiologists are based in teaching hospitals, leaving more than one hundred public hospitals with no radiological reporting services. A study conducted by Henostroza et al.,^[21] found that a vast majority of chest X-rays were read by clinical officers who have limited training and varied image interpretation

experiences. This study found lower inter-rater reliability in image interpretation amongst clinical officers. This situation is a concern because it could lead to misdiagnosis and mismanagement of patients' diseases and injuries.^[7,10] The international reporting standard practice is that the referring medical practitioner, where appropriate, can initially read the images, but all patients should have a final written report from a radiologist or reporting radiographer.^[2,22]

There are three critical elements to every diagnostic imaging examination.^[22, 23] Firstly, the examination must be appropriately justified. A medical exposure is justified if the examination will do more good than harm. Secondly, the examination needs to be performed in a timely and accurate manner to maximise the diagnostic potential of the investigation. Thirdly, the report on the findings of the examination must be timely and communicated effectively to the referring medical practitioner to ensure it influences the patient's treatment pathway. In the Zambian context, the first two elements are being adhered to, whilst the third element is being partially adhered to but only in teaching hospitals, due to a critical shortage of radiologists and the non-availability of reporting radiographers.

In view of the above, there is a need to change the policy and structures in the healthcare system to enable radiographers to be trained to report on plain film radiographs. It is worth stressing that radiographers who have undertaken appropriate training in ultrasonography are registered with the regulator, the Health Professions Council of Zambia (HPCZ), as sonographers and undertake and report on ultrasound examinations. Radiographers can become registered as specialists provided there is a distinction between the role provided by a radiologist and a reporting radiographer. The breadth of ability and the level of expertise of radiologists should not be ignored.^[1] This means that reporting radiographers should know their limitations in this role, and, where appropriate consult, with radiologists.

Radiography Education and Training in Image Interpretation

In Zambia, the diploma qualification in radiography offered by Evelyn Hone College includes X-ray pattern recognition and the degree programmes offered by the Lusaka Apex Medical University and the University of Zambia have incorporated image interpretation. This enables radiography graduates to evaluate images appropriately during the examination and perform the Red Dot system. However, this is basic training; postgraduate specialised training is required in order to formally report on diagnostic images.

In the UK, to become a reporting radiographer one must complete a postgraduate education and training programme approved by the College of Radiographers.^[2] Price^[24] reports that undergraduate education is important to prepare students in the skills necessary beyond their first qualification and postgraduate education is vital for specialisation. This builds on initial education and training, concentrating on developing clinical skills and knowledge of diseases, trauma processes and manifestations; image interpretation theory, including errors, clinical history, signs and symptoms, laboratory tests, multi-disciplinary consulting, communications, and medical-legal issues.^[22,23] Typically, this involves a formal programme of education at master's level together with clinical training, which includes a log of up 1500 different reported examinations.^[23] This is considered appropriate for the development of the knowledge and skills of image interpretation and reporting.

In developing and implementing an image interpretation course for radiographers in Zambia, a UK model of qualification could be adopted at three levels: postgraduate certificate, diploma and masters. The postgraduate training programme could be offered to both diploma and degree holders and delivered through blended learning over a period of three years.

Currently, the trainees could be recruited from hospitals with radiologist services where the radiologists could act as clinical supervisors for reporting radiographers' trainees.

Benefits and Challenges to the Introduction of the Reporting Radiographers

The training of radiographers in image reporting would bridge the gap created by the critical shortage of radiologists.^[18] The College of Radiographers^[2] also reports that reporting by radiographers leads to service improvement for patients and referring medical practitioners as the volume of unreported examinations and the time taken for a report to be communicated is reduced. This allows timely and accurate diagnoses and subsequent treatment of patients as well as enhancing patient care as it results in overall reduced waiting time. The training of reporting radiographers in Zambia would help to achieve government goals of offering affordable and closer services to the people. Williams^[1] notes that extending the role of a radiographer would create better career opportunities which are linked to job satisfaction and professional recognition. In a Zambian's radiography career pathway, this would include the introduction of advanced practice level. However, there could be resistance to change from radiologists for fear of losing part of their role of reporting on plain film radiographs. Other challenges would be competition with radiology trainees on the newly introduced radiology specialised training programme, difficulties in releasing radiographers for training due to staff shortages, financial constraints, such as funding for training, and appropriate remuneration for the reporting radiographer level.^[1] However, the benefits outweigh the challenges in the delivery of diagnostic imaging services.

CONCLUSION

This article provides evidence that there is a compromise of radiology services, due to a critical

shortage of radiologists, in providing timely and effective diagnostic imaging reports. Although the Ministry of Health has recently introduced radiology specialised training programme for medical doctors, it will not overcome this challenge due to an increased demand on diagnostic imaging services in Zambia; there is a necessity to formally permit radiographers, who are available in all hospitals offering diagnostic imaging services, to undertake image interpretation training and report on plain film radiographs. The incorporation of the radiologists and medical professions during the time of planning and implementation is essential for the success of the initiative.

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