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THE NEED FOR A MULTIDISCIPLINARY ORAL ONCOLOGY CLINIC: ALIGNING ORAL HEALTH WITH ONCOLOGY PRACTICE

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INTRODUCTION

The increasing global burden of oral cancer accentuates the urgent need for an integrated, multidisciplinary approach to care that fully incorporates oral health into the broader oncology framework. Despite the high prevalence of oral complications among patients undergoing chemotherapy, radiotherapy, and surgical treatment for head and neck cancers, oral care remains insufficiently embedded within standard oncology protocols.

AIM AND BENEFITS

Establishing a multidisciplinary oral oncology clinic offers a strategic response to this gap. Such a clinic would bring together professionals from dentistry, oncology, maxillofacial surgery, prosthodontics, speech and swallowing therapy, nutrition, and psychology to deliver coordinated, patient-centered care. Oral oncology, as a specialised branch of dentistry, focuses on the unique oral health challenges associated with cancer therapy. Dental professionals trained in this field are essential in managing and preventing complications such as mucositis, oral infections, dental deterioration, and pain, conditions that can significantly impact treatment outcomes and patient well-being. A centralised oral oncology service would improve quality of life by facilitating early detection and timely intervention, minimising treatment disruptions, and promoting functional and aesthetic rehabilitation. Furthermore, it would help prevent serious complications such as osteonecrosis and chronic mucosal injury, while supporting long-term recovery. Beyond clinical benefits, the model enhances patient psychosocial support, streamlines interdisciplinary decision-making, and reinforces continuity of care across medical institutions. Importantly, such a clinic could serve as a platform for practitioner education, caregiver training, and patient engagement in research and clinical trials. By incorporating oral health into the oncology care continuum, this initiative enhances clinical outcomes and promotes a more compassionate, comprehensive approach to cancer care.

SUMMARY

Dental professionals are integral to the multidisciplinary management of oral cancer. Their role in prevention, early detection, treatment planning, and supportive care is crucial to improving patient outcomes and ensuring a higher quality of life throughout the cancer journey.

THE TREATMENT OF EARTHQUAKE-RELATED INJURIES IN DEVELOPING, AND DEVELOPED COUNTRIES. THE VITAL ROLE OF RADIOGRAPHY

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BACKGROUND

Earthquakes are a devastating natural phenomenon that can severely disrupt a community's health. Radiographic services are essential for triage, treatment, and forensic practice during a disaster response. However, disparities regarding access to modern radiographic equipment and trained professionals exist between developing and developed countries, potentially contributing to the disproportionately higher mortality rates in developing countries during an earthquake. It is important to understand the role of radiography and the challenges faced when implementing a radiographic disaster response to recognise the potential implications these disparities have on health outcomes.

AIM

To assess the role of radiographic practice in disaster response in order to identify the gaps in management between developing and developed countries to contribute to the broader knowledge of future emergency radiographic practice.

OBJECTIVES

- To highlight why a systematic literature review is an appropriate search strategy that will support this study ethically and timely manner, including determining suitable inclusion/exclusion criteria and search terms.
- To critically appraise the literature found using CASP review checklists.
- To discuss the importance of radiography in treating earthquake-related injuries and forensic practice and how its role may differ in developing and developed countries.
- To conclude how variation in radiographic practices between developing and developed countries may lead to disparities in health outcomes post-earthquake.
- To provide insights for future radiographic practices.

METHODS

A systematic literature review was conducted to synthesise the available research. An exhaustive search was achieved using the databases Science Direct, CINAHL, and PubMed, specifying key terms, Boolean logic, and strict inclusion/exclusion criteria to satisfy the pursuit of relevant literature. Critical appraisal checklists were used to evaluate the quality of the research found and to assess common themes among the studies.

RESULTS

In terms of the literature radiography is important in triaging and diagnosing earthquake-related injuries. Ultrasound and mobile X-rays were the most accessible and reliable modality due to their low power requirements, especially in resource-poor environments. While CT was shown to be the superior modality for trauma imaging, it was not accessible for all. The research highlighted that while economic status can influence the success of disaster response, adequate preparation is required to support radiographic disaster responses better. Skeletal, thoracic, and abdominal injuries were prominent post-earthquake. Developing countries generally saw higher mortality and morbidity rates. It is important to note that beyond government healthcare investment and preparedness strategies, the scale and severity of the event may create delays in radiographic response, influencing findings. A pattern of logistical constraints creating delays in access to medical imaging was shown to affect patient outcomes negatively. Power failure was a common factor limiting the utility of radiographic services. Forensic imaging was shown to support the disaster victim identification and the determination of the cause of death processes. However, logistical challenges were highlighted when considering the application during a large-scale disaster.

CONCLUSION

Radiography is critical in disaster response, clinically and in forensic practice. This review indicates that factors beyond economic investment, such as adequate preparation and the severity of the earthquake can further influence a disaster response. However, economic constraints have been shown to exacerbate barriers to the access and functionality of imaging amenities. Effective disaster planning and local and international collaboration and support can bridge these gaps, providing a more positive prognosis for patients living through earthquakes.

IMAGE QUALITY OF POST-MORTEM COMPUTED TOMOGRAPHY SKELETAL SURVEY: A SINGLE CENTRE AUDIT AND TRAINING INITIATIVE

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INTRODUCTION

Image quality should be optimum in post-mortem computed tomography skeletal survey (PMCT-SS).

AIM

The aim of the study was to assess the image quality of post-mortem computed tomography skeletal survey (PMCT-SS) at a single centre and to make recommendations for training to improve the performance of PMCT-SS examinations based on specific issues identified.

METHODS

PMCT-SS examinations conducted at a single centre (Sheffield Children's Hospital) were independently assessed for image quality by two observers. The first observer was a consultant paediatric radiologist (C.N.). The second observer was a radiographer (S.Z.A.). Each assessed the image quality using a binary scoring system ("Yes" if the criterion was scored as acceptable, and "No" if the criterion was scored as unacceptable) based on five key criteria: spatial resolution, image noise, contrast resolution, imaging artefacts, correct alignment, and anatomical coverage. Agreement between observers was assessed for each image quality criterion using kappa (κ).

RESULTS

Forty-five PMCT-SS examinations were assessed by the two observers for image quality (22 males, mean age 5.5 months), yielding 90 scores for each criterion. The majority of examinations were scored acceptable across all criteria, except for image artefacts, which had the highest rate of unacceptable scores (60%). This was followed by correct alignment and anatomical coverage (both 14.4% unacceptable). Spatial resolution, contrast resolution, and image noise had the lowest rates of unacceptable scores (≤5.6%). Inter-reader agreement ranged from substantial to almost perfect (κ = 0.73 to 0.96).

CONCLUSION

PMCT-SS quality is mostly affected by image artefacts, misalignment, and incomplete coverage. Spatial resolution, contrast resolution, and image noise are less common issues. We recommend training for radiographers on the causes of image artefacts and how to reduce their influence on imaging outcomes. Training on the importance of correct alignment and anatomical coverage would also be beneficial.

HARRIS LINES AND THEIR IMPACT ON TRABECULAR BONE MICROARCHITECTURE: A MICROCOMPUTED TOMOGRAPHY INVESTIGATION

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BACKGROUND

Harris lines (HL) can be observed as bands of increased radiodensity in radiographs of bones, comprising transversely oriented trabeculae. They are proposed to be skeletal markers of nonspecific stress that form when growth is briefly arrested and therefore are frequently used in past population health studies. However, some studies suggest that HL occur as part of normal bone development. Despite the established debate surrounding the aetiology of HL, there has been limited research into their 3D micro-architecture.

AIM

The aim of the project was to qualitatively and quantitatively investigate the trabecular microarchitecture of HL within the juvenile distal tibia using microcomputed tomography (micro-CT).

METHODS

Radiographs of 97 subadult tibiae of 55 individuals from the Scheuer juvenile skeletal collection were assessed for the presence of HL. Once identified, the number of HL, and their position within the bone, were recorded. Subsequently using micro-CT scans of 21 tibiae, HL trabecular bone and non-HL trabecular bone architectural parameters (degree of anisotropy (DA), bone volume fraction (BV/TV), connectivity density (Conn.D), and trabecular number (Tb.N), separation (Tb.Sp) and thickness (Tb.Th)) were quantified using ORS Dragonfly. Intra-observer agreements for identification of HL, number of HL and 3D microarchitecture parameters were assessed using Cohen's Kappa and one-way repeated measures ANOVA/Friedman test ($p \leq 0.05$).

RESULTS

HL identification yielded very good agreement (Cohen's Kappa = 0.783), and there was no statistically significant difference between the number of HL counted between repeats. There were however statistically significant differences between 4 of the 7 trabecular parameters recorded in the HL cross sections between three rounds of observations. Following visual assessment of the micro-CT images, HL appeared to 'spiral' through the bone, as opposed to being single, transverse lines across the bone. This might have led to increased subjectivity and decreased intra-observer agreement in selection of beginning and end image slices.

Comparing HL to non-HL trabecular bone, 4 out of 6 metric parameters demonstrated statistically significant differences. Conn.D and Tb.Th showed no statistically significant differences, indicating that despite HL being described within the literature as possessing thickened and highly interconnected trabeculae, this was not supported by the results. HL bone displayed increased Tb.N with decreased Tb.Sp, lower BV/TV, and is more isotropic than non-HL trabecular bone. When HL located at different positions within the tibia were compared, no statistically significant differences were observed in any trabecular parameters. As bone (re)models with age, differences would have been expected in the parameters, brought about by changing biomechanical and developmental demands. The results indicate that the trabecular microarchitecture of HL might be less affected by biomechanical changes than the typical trabecular bone.

CONCLUSION

The initial findings of this study highlight the need to revise the understanding of the formation process of HL as well as their interpretation. Future research should aim to increase the sample size and use a scaled volume of interest height to improve intra- and ultimately inter-observer agreement.

A SYSTEMATIC REVIEW OF UNDERGRADUATE INTERPROFESSIONAL EDUCATION TO INFORM APPLICATION IN RADIOGRAPHY

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BACKGROUND

Radiography professionals form part of an integrated interprofessional team delivering healthcare. Teaching and learning activities of radiography students are performed independently from other professions consequently graduates have limited interprofessional competencies. Graduates first interact with other professions in clinical practice as part of a healthcare team. In response this, the World Health Organisation (WHO), developed and globally implemented a universal plan for interprofessional education (IPE). According to the WHO "Interprofessional education occurs when two or more professionals learn about, from and with each other to enable effective collaboration an improve health outcomes".

AIM

The aim of this systematic review in progress is to determine best practices in undergraduate IPE teaching and learning to enable the development of IPE competencies of radiography students.

METHODS

In this study in progress a systematic review of IPE teaching and learning practices was used to identify necessities for the implementing IPE in radiography. Primary and contextual records and peer reviewed research related to undergraduate IPE, published between 2000 and 2023 were included in this study. The PICO framework was used to review records. The six steps qualitative thematic analysis by Braun and Clarke guided the review of the records included.

RESULTS

Analysis of 300 records have been completed of which 51 records were included in the systematic review (four duplications and 245 records that did not fit the purpose of the study were excluded. The following themes were derived from the 51 records: contact hypothesis (n=4), interprofessional cognitivism (n=12), interprofessional socialisation (n=7); optimal learning practices (n=21) and challenges (n=7). Contact hypothesis relates to developing knowledge about other health professions. Here purposive socialisation of healthcare students addresses preconceived stereotypes related to academic and medical competence and the traditional roles. Interprofessional cognitivism allows students to assimilate and apply newly acquired knowledge promote equality. Interprofessional socialisation, relates to a three stage interprofessional socialisation framework: breaking down barriers; development of IPE competencies and understanding the role of self and others. Examples of learning practices from literature include simulation, case study, community-based initiatives and Service-learning and use of online and AI technologies. Challenges: planning and coordination of activities, resource availability, and differences in profession specific statutory and academic requirements.

CONCLUSION

The preliminary results indicates that IPE teaching and learning practices requires teaching and learning that encourages collaborative learning between radiography students and students from other health professions. There is no single approach to developing, implementing and operationalising interprofessionalism. The use of IPE is context specific and requires collaboration between different health professions academics to ensure the correct type of contact that encourages socialisation and the cognitive processes that develops the necessary IPE competences.

A RADIOGRAPHER'S EXPERIENCE OF PAEDIATRIC FORENSIC IMAGING

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BACKGROUND

Paediatric forensic imaging presents some of the most complex and emotionally demanding challenges in radiographic practice. This presentation explores the professional and personal challenges encountered in the specialised field of paediatric forensic imaging, with particular focus on suspected physical abuse (SPA) cases. Drawing on the author's experiences, the presentation considers the radiographer's role in medico-legal investigations involving children, highlighting the necessity of combining paediatric expertise—such as effective communication, appropriate immobilisation and child-centred care—with clinical precision, sensitivity, and strong ethical responsibility.

METHOD

Key aspects of practice are examined, including adherence to forensic protocols, image acquisition under legal scrutiny and effective collaboration with multidisciplinary teams such as police, pathologists and paediatric specialists. While acknowledging the emotional and psychological demands of the work, the focus remains primarily on the practical, ethical and professional aspects of delivering high-quality forensic imaging in sensitive circumstances.

In addition to imaging living children in SPA cases, the presentation also addresses the radiographer's involvement in post-mortem imaging. This includes forensic post-mortem cases, sudden unexpected death in infancy (SUDI), and the detailed imaging of resected bones as part of the investigative process. These cases bring their own procedural, technical, and emotional considerations, requiring a high degree of interdisciplinary coordination, professional sensitivity and advanced practical and technical skills.

CONCLUSION

This presentation underscores the vital and developing role of radiographers in paediatric forensic imaging, underscoring their key contribution to safeguarding children and ensuring the accuracy and reliability of radiographic imaging in legal investigations. It highlights the need to recognise radiographers' skills, alongside the provision of continuous support and focused training to meet the challenges of paediatric forensic imaging.

KNOWLEDGE OF AND ATTITUDE TOWARDS RADIATION SAFETY IN NON-RADIOLOGICAL STAFF WORKING IN THE PRIVATE SECTOR IN ETHEKWINI DISTRICT

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BACKGROUND

Numerous studies have shown that unmanaged radiation exposure (ionising radiation) can result in numerous pathologies, such as cancer, which explains why its use in the medical field has so many regulations. An estimated 2.5+ billion diagnostic radiological examinations are conducted globally every year. This implies that radiological and non-radiological staff are exposed to radiation 2.5+ billion times a year. This is a major health concern, amidst reports of low levels of understanding about the negative impacts of radiation exposure among non-radiological staff in various public hospital settings. Hence, more studies need to be conducted in both private and public health settings to gain insight on the levels and extent of radiation safety practices and knowledge.

AIM

This study sought to ascertain the level of knowledge of and attitude towards x-ray radiation safety amongst non-radiological staff in the private sector within the eThekwini district of KwaZulu-Natal, in order, to minimise avoidable radiation exposure amongst non-radiological personnel.

OBJECTIVES

- To determine the level of knowledge of radiation safety amongst non-radiological personnel.
- To determine non-radiological staff attitudes towards the importance of radiation safety.
- To recommend measures that non-radiological staff can utilise to ensure radiation safety.

METHODOLOGY

A descriptive quantitative research methodology was used. There were 92 respondents selected using the convenience sampling method; 60 participated (65% response rate). Research administered cross-sectional questionnaires were used to collect data from willing respondents. The questionnaires included various questions related to radiation protection. The responses were coded and captured in a Microsoft Excel spreadsheet, then transferred to SPSS version 27 for analysis.

RESULTS

Findings showed a significant discrepancy in knowledge levels across different professions, with physicians and individuals in 'other' professions demonstrating notably higher knowledge compared to nurses (p = .010 and .047, respectively). The results showed that attitudes towards radiation protection regulations varied significantly amongst professions, with physicians, nurses and those in 'other' professions exhibiting more positive attitudes compared to porters (p = .001, .006 and .021 respectively). Moreover, 78% of the respondents did not know the directly proportional relationship between time spent in the x-ray room and amount of radiation received; and 72% of the respondents were not aware of the phenomenon of scattered radiation. There were significant differences between the attitude and profession variables: ICU nurses expressed more positive attitudes compared to those from the radiography (p<.001) and emergency departments (p=.012). Non-radiological staff from the emergency and general wards also displayed more positive attitudes than those from radiography (p=.036 and .002, respectively). A weak negative correlation was found between attitude and frequency of contact with (rho=-.344, p=.007). Nonetheless, gender and race did not reach statistical significance.

CONCLUSION

Valuable insights into the current state of radiation safety knowledge and attitudes amongst non-radiological staff in the private healthcare sector were identifies. Addressing the identified knowledge gaps and fostering a culture of radiation safety awareness are essential steps towards ensuring the well-being of both healthcare workers and patients. Continued efforts in education, training and a regular evaluation of practices are crucial for maintaining a safe working environment in healthcare settings.

RADIOGRAPHIC METHODS: ADVANCING AGE ESTIMATION IN THE WESTERN CAPE, SOUTH AFRICA

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BACKGROUND

Estimating the age of human remains is a key challenge in both forensic science and anthropology, typically based on age-associated changes in bones and teeth. Teeth are particularly valuable in identifying unknown individuals, especially in cases involving advanced decomposition or fire damage. Moreover, age estimation plays a crucial role in narrowing down potential matches in missing persons databases. At medico-legal laboratories in the Western Cape, South Africa, Gustafson's method is frequently used for dental age estimation. However, its accuracy has been questioned when applied to the local population.

AIM AND OBJECTIVES

This study sought to create a more precise and user-friendly method for estimating adult age using dental data. The primary objectives were: (1) to calculate the pulp-to-dentine ratio by analysing periapical radiographs in both mesiodistal and buccolingual views, and (2) to assess the relationship between this ratio and the individual's chronological age.

MATERIALS AND METHODS

The study analysed 74 mandibular central incisors and 72 mandibular lateral incisors from 45 cadavers donated to the Department of Anatomy and Histology, Faculty of Medicine and Health Sciences, Stellenbosch University. The donors ranged in age from 21 to 95 years. Radiographs were taken in both mesiodistal and buccolingual orientations to measure the pulp-to-dentine ratio.

RESULTS

A stronger correlation was observed between age and measurements taken from buccolingual-oriented radiographs compared to those from the mesiodistal orientation. These findings were benchmarked against results obtained using Gustafson's method.

CONCLUSION

The radiographic technique developed in this study proved to be more accurate than Gustafson's method when applied to this specific sample group.

THE INFLUENCE OF CLINICAL RESOURCES ON RADIOGRAPHIC COMPETENCE IN DIAGNOSTIC RADIOGRAPHY DURING WORK-PLACE-BASED LEARNING (WBL)

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INTRODUCTION

Clinical resources are essential to develop diagnostic radiography students' competence during work-place based learning (WBL). WBL is a structured educational approach that integrates academic learning and practical experience during clinical training. Radiographic competence is achieved through theoretical and practical learning, clinical experience and supervision. Clinical resources have a beneficial and detrimental impact on students' competence depending on factors such as access and limitation of resources. Clinical resources are inconsistent in clinical training centres despite all clinical training centres being accredited by the Health Professions Council of South Africa (HPCSA).

METHODOLOGY

A qualitative, exploratory-descriptive research approach was utilised, collating data from 21 second- year, third-year and fourth-year diagnostic radiography students through one-on-one semi-structured interviews on Microsoft Teams.

RESULTS

The three main themes were identified through thematic analysis using Atlas.ti: student's understanding of clinical resources during WBL; perception of clinical resources in the context of WBL; and student competence during WBL. Findings revealed that clinical resources had a positive influence on students' competence despite some challenges encountered during clinical training. Additionally, students with a deeper understanding of clinical resources were more likely to establish a connection between clinical resources discussed during theoretical learning and adaptation to clinical resources available during WBL. Access to equipment, clinical tutors, patient diversity and access to a wide range of radiographic examinations significantly contributes to students' competence. Students' perceptions of clinical resources varied as a result of their place of training in either public or private training and year of study. Lack of equipment, inadequate staffing for mentorship, lack of exposure to some modalities and faulty equipment are some of the challenges that affect competence negatively. A

structured rotational system was one of the solutions mentioned by some students to attain a similar level of competence comparable to their peers.

CONCLUSION

Clinical resources influence student competence depending on access and limitation of resources during clinical training. Findings may be expanded to other disciplines of radiography to encourage a strategic evaluation of clinical training policies to improve students' overall learning experience and competence during WBL.

CAN A LOW-DOSE CT SKELETAL SURVEY REPLACE 33 X-RAYS IN THE INVESTIGATION OF SUSPECTED PHYSICAL ABUSE?

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BACKGROUND

A series of 16-33 X-rays is the current 'gold standard' for imaging suspected non-accidental injury (NAI) or suspected physical abuse (SPA).

AIM AND OBJECTIVES

With advances in technology, the aim of this research is to determine whether a low-dose CT (LDCT) skeletal survey scan can replace the radiographic skeletal series.

METHOD

Two literature reviews were conducted and published. A phantom study was undertaken to establish an estimated effective radiation dose and associated radiation risks for commonly performed radiographs, including a skeletal survey series, as recommended by the RCR. Ethics approval and a waiver of consent was obtained for a patient study which collected data from 9 X-ray units in Australia to propose LDRLs. A number of LDCT scans were acquired using an anthropomorphic phantom. Ethics approval was granted to undertake an image quality assessment to determine the threshold at which the CT images became undiagnostic and to compare to the radiographic doses.

RESULTS

The literature reviews identified a gap in literature to support a change in clinical practice.Typical doses for the individual X-ray projections in the anthropomorphic 5-year-old phantom ranged from 3-86 mGy•cm^2, whilst the effective doses ranged from 0.00004-0.07 mSv. The radiation risks were 'minimal' to 'negligible'. The median effective radiation dose to the phantom for a skeletal survey X-ray series was 0.09 mSv, which resulted in a very low additional risk of radiation-induced cancer (1 in 40,000). The additional radiation-induced death (1 in 90,000) is equivalent to the risk of dying from being stuck by lightning. The most commonly radiographed body parts in children, as determined by the patient study, were the chest, wrist, abdomen, elbow and foot. The proposed LDRLs ranged from 4-844 mGy•cm^2. The lowest effective radiation dose achieved for a diagnostic CT scan was 0.09 mSv. Measurement of fracture detection across 3 studies, which included 20 radiographers, 5 paediatric radiologists and 2 forensic pathologists, suggests that human reviewers struggle to identify the more subtle fractures on LDCT that are associated with NAI/SPA.

CONCLUSION

There is insufficient evidence to currently support a change in practice from a series of radiographs to a LDCT skeletal survey in the investigation of NAI/SPA.

PROPOSED DRLS FOR FREQUENTLY PERFORMED PAEDIATRIC X-RAYS EXAMS

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BACKGROUND

Paediatric diagnostic reference levels (DRLs) are dose levels for typical medical imaging examinations for broadly defined types of equipment with weight-stratification preferred by the International Commission on Radiological Protection. Australia has never published paediatric DRLs for general radiography.

AIM

The aim of this study was to collect radiation dose metrics for commonly performed radiographic projections in children in Australia and propose weight-based DRLs.

METHODS

Ethics approval was granted to collect data, along with a waiver of consent. Radiographs were acquired in accordance with local protocols using direct digital X-ray equipment for children who presented for routine radiographic imaging. A spreadsheet was provided to each centre to record each patient's age and weight, as well as tube voltage and current-time product, source-to-image distance, use of a grid, additional filtration, automatic exposure control chamber selection and the displayed air kerma area product (KAP). Facility reference levels (FRLs) were calculated as the median for each X-ray unit if ≥2 patients were included. The 75th percentiles of the FRLs across nine X-ray units from five centres were calculated as the proposed Local DRLs (LDRLs).

RESULTS

The most commonly radiographed body parts in children were the chest, wrist, abdomen, elbow and foot. The proposed LDRLs range: from 4 mGy•cm^2 (oblique hand in 5-15 kg) to 844 mGy•cm^2 (antero-posterior pelvis in 50-80 kg).

CONCLUSION

The estimation of LDRLs for radiographs from a weight-based patient study offers Australian reference values for guidance in the optimisation process.

FACILITATING CREATIVITY DEVELOPMENT IN RADIOGRAPHY THROUGH A VIRTUAL COMMUNITY OF PRACTICE

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BACKGROUND

Creativity is identified as one of the skills that students require to succeed in contemporary society. This skill is key in healthcare settings as it allows multiple disciplinary healthcare teams to innovatively solve complex situations through collaboration, communication and critical reasoning. In turn, then, creativity assists in improving patient management and

outcomes. This calls for innovative educational strategies to facilitate the development of creativity among radiography students. A strategy highlighted in literature is for radiography educators to develop creativity through a community of practice (CoP).

AIM

Through an online platform for educators and students, our work aims to create a sustainable community of practice to develop and express creativity as part of reflective learning.

METHODS

Educators and students will participate in international virtual online CoP sessions hosted on Zoom or Teams. Each session will be themed around a specific radiography-related classroom activity or clinical scenario. Participants will engage with the topic before the online session. During the session, participants will present their topic and discuss how they adopted creative strategies to support the development of their reflective practice. The CoP will also be a space where participants can share their creative artefacts as part of their reflections as either students or educators.

A potential outcome of this work is to develop a sustainable international virtual CoP that facilitates the development of creativity among students and educators. Additionally, we envisage that participants will form professional networks to transfer their learning from the CoP into their learning and teaching spaces as creative learning fosters originality, curiosity and critical thinking. It is envisaged that through the CoP, transformative learning opportunities will present students with opportunities to develop an identity in their healthcare journey.

CONCLUSION

The insights about an international virtual CoP, a work in progress, aim to facilitate creativity through reflective practice among students and educators, an important 21st-century skill required of healthcare professionals and educators alike. Further, the virtual CoP will provide a platform for participants to share their creative artefacts.

RADIOGRAPHY STUDENTS' PERCEPTIONS OF THE ATTRIBUTES REQUIRED FOR CLINICAL EDUCATORS

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BACKGROUND

A bachelor's degree in radiography is a programme that requires students to study theory at a higher education institution (HEI) and undergo clinical training at an accredited training facility. A clinical educator (CE) is responsible for the clinical training and supervising of students to acquire skills and knowledge during work-integrated learning (WIL). A CE can have a positive or negative influence on students depending on their clinical and interpersonal attributes. Extensive research has been conducted internationally justifying the need for certain attributes in CEs in other health professions. However, there is a paucity of literature on radiography students regarding the attributes they require of CEs in South Africa.

AIM AND OBJECTIVES

The aim of this qualitative contextual study was to explore and describe radiography students' perceptions regarding the attributes of their CEs upon the successful implementation of the degree programme at the HEI. The objectives of the study were: to explore and describe the perceptions of students regarding the attributes of their CEs after the implementation of the degree programme at the HEI in South Africa; and to propose recommendations to support CEs in radiography to enhance the effectiveness of the WBL experience for the students from the research findings.

METHODS

Eighteen radiography students (diagnostic radiography, nuclear medicine technology, diagnostic ultrasound, and radiation therapy) at an HEI in South Africa participated in the qualitative study. The data collection tool used was unstructured indi-

vidual interviews. Data were collected through in-depth in-person and online interviews. Data were analysed using thematic analysis.

RESULTS

The study revealed four themes highlighting the students' need for CEs who possess personality traits that foster and enhance their performance. These CEs should establish an environment conducive to productive learning for students, encourage learning within the context of workplace-based learning, seamlessly integrate theoretical knowledge into clinical practice, and consistently exhibit professional attributes.

CONCLUSION

The findings from the study emphasise how the attributes and personality of CEs can significantly influence students' experiential learning (WIL). The presence of a strong moral connection between students and CEs was considered a crucial aspect for successful clinical learning. The attributes of CEs for the implementation of the degree programme at the HEI were identified. This study confirmed that CEs require certain personality traits to create a productive learning environment. Promoting a professional self-image to facilitate professional interactions and relationships, having certain professional attributes, and being a role model for students, were highlighted. Recommendations were proposed to enhance the effectiveness of the workplace-based learning experience for students based on the research findings and to support CEs in radiography.

ACCURACY OF BOWEL ULTRASOUND IN DETECTING INFLAMMATORY BOWEL DISEASE AT A TERTIARY HOSPITAL IN SOUTH AFRICA

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BACKGROUND

Inflammatory bowel disease (IBD) is a chronic disease characterised by a relapsing-remitting pattern causing chronic inflammation in the gastrointestinal tract. This pattern causes long-term bowel damage and complications, such as stenosis and perforation, which may affect a patient's quality of life. The exact cause of IBD remains unknown. However, it is thought to be a result of immune system dysfunction, genetics, autoimmune conditions, and/or environmental factors. The incidence and prevalence of IBD have increased significantly over the last decades, affecting over 6 million people globally. IBD may occur at any stage of life and is more common among the White South African population and people with a family history of IBD. Early diagnosis is, therefore, crucial to ensure effective management of this disease. The diagnostic and monitoring gold standard for IBD is a colonoscopy with a biopsy, which is invasive and carries the risk of bowel perforation. An alternative, such as a bowel ultrasound (BUS), is advantageous as it is non-invasive, cost-effective, and readily available.

AIM

To determine the accuracy of a BUS examination, in diagnosing IBD, when compared to the gold standard colonoscopy with biopsy.

OBJECTIVES

To use a BUS imaging protocol to make a preliminary diagnosis of IBD with BUS. To compare the preliminary diagnosis with that of the confirmatory diagnosis using histology.

METHOD

The study population included adult patients with suspected or confirmed IBD at a tertiary hospital in the Free State, South

Africa. All participants underwent a clinical and biochemical assessment, colonoscopy with biopsy, and an abdominal ultrasound scan of the bowel, which was performed by a single sonographer. A BUS imaging protocol (eight bowel ultrasound parameters) for IBD was used as a guide to perform the BUS examination. A radiologist made a preliminary diagnosis using the BUS protocol. Fisher's exact test ($p = 0.05$) was performed to determine whether an association existed between the preliminary IBD diagnosis and confirmation. Fisher's exact tests were also performed individually on each BUS parameter to determine whether a statistically significant association existed between the different diagnostic patient groups. The accuracy of BUS diagnosis was calculated for the individual parameters and the preliminary ultrasound diagnosis. Written consent was obtained from each participant. The study was approved by the University of Free State HSREC, ethics clearance number UFS-HSD2022/0610/2911.

RESULTS

Seventy-seven adults participated in the study. The BUS diagnosis of IBD was accurate in more than 80% of the participants. The accuracy estimates of the BUS parameters for the diagnosis of IBD were greater than 80% for bowel wall thickness and vascularity. The estimates for the other parameters ranged from 66% to 72%. Fisher's exact test established a significant association between the BUS diagnosis and the confirmatory histology diagnosis of IBD (two-tailed $p < 0.00001$).

CONCLUSION

The potential use of BUS parameters as a sifting or screening tool should be considered in the workup to expedite the diagnosis of IBD. A BUS is a noninvasive, accurate imaging tool that can be included in the diagnostic workup for the primary examination of IBD. It is a safe, inexpensive procedure that can serve as a screening tool for the rapid diagnosis of IBD patients. As a readily available and cost-effective imaging option, BUS is a practical technique, especially in settings with limited resources.

RADIOGRAPHERS AND AI, OPPORTUNITIES AND CONCERNS

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ISRRT and Nrf, Oslo, Norway

The presentation highlights the changing role and new opportunities for radiographers with use of AI in terms of adaptions in regulations, education and clinical practise that are needed in order to use applications with AI for the best of our patients. When/if support from AI leads to more clinical responsibilities as radiographers, do we have the needed skills to communicate findings and give advice to patients? What have we experienced of the results in using AI as diagnostic support tool? What pitfalls are there in daily use of AI and how can we avoid them? Should we use AI in general and at what cost? I will show results and recommendations from the clinical use of AI by radiographers and radiation therapists in Norway, recommendations from EFRS and ISRRT and from ongoing regulatory work at EU and the international standardisation organisation ISO.

THE UTILISATION OF DIGITAL RADIOGRAPHY BY DIAGNOSTIC RADIOGRAPHERS IN SOUTH AFRICA

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BACKGROUND

Digital radiography is broadly divided into two sub-imaging systems: computed radiography and flat-panel detectors. The latter are further divided into two sub-imaging systems: direct and indirect conversions. Computed radiography is also known as cassette-based digital radiography. It offers numerous features that diagnostic radiographers can utilise on a day to day basis. However, some of these features seem to be hardly ever used by diagnostic radiographers in South Africa.

AIMS

The first aim of this study was to gain a deeper understanding of the utilisation of digital radiography features by diagnostic radiographers in South Africa. The second was to develop a curriculum framework to guide institutions of higher learning in South Africa in the development and implementation of curricula that adequately address the current digital radiography developments and training needs in the field of diagnostic radiography.

STUDY DESIGN

A mixed methods approach involving three phases was used to address the study objectives. Phase 1 focused on a document analysis of the current diagnostic radiography study guides that are used at institutions of higher learning in South Africa. Phase 2 focused on an online survey of current practising diagnostic radiographers in South Africa. Phase 3 involved focus group interviews with diagnostic radiographers working in different imaging facilities in both the private and public sectors in South Africa.

RESULTS

Phase 1 results highlight three main categories of digital radiography feature curricular coverage: digital radiography features are inadequately covered by the analysed study guides for undergraduate diagnostic radiography; digital radiography features are adequately covered; and digital radiography features not not covered. Phase 2 results reflect a quantitative analysis of the application and utilisation of the various digital radiography features. Phase 3 results highlight four main categories in the clinical application and utilisation of the various digital radiography features: features hardly used or never used; features commonly used; features radiographers are not interested in using; and features about which radiographers have no knowledge.

CONCLUSION

Digital radiography features are in general not adequately covered in the undergraduate curricula of institutions of higher learning offering courses in diagnostic radiography in South Africa. Practising diagnostic radiographers utilise the various available features of digital radiography only sub-optimally. To a certain extent, some radiographers even lacked basic knowledge of digital radiography jargon. The diagnostic radiography profession in South Africa is facing various challenges, such as an outdated formal scope of practice, as well as the ambiguity role between diagnostic radiographers and information technology specialists.

EVALUATING OPTIMAL CLEANING GUIDELINES FOR RADIATION PROTECTIVE GARMENTS TO MITIGATE CROSS-CONTAMINATION IN AN OPERATING ROOM COMPLEX IN TSHWANE, GAUTENG

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BACKGROUND

A lack of standard infection control precautions in the operating room (OR) can increase the risk of a patient obtaining nosocomial infections. During surgery, surgeons utilise ionising radiation (x-rays) to confirm the precise placement of hardware and instruments. Lead rubber aprons (LRAs) and thyroid shields (TSs) are worn by staff members in order to protect them from ionising radiation in the OR. LRAs and TSs are worn near sterile fields, patients and other equipment inside of the OR.

AIM

To identify the microorganisms present on LRAs and TSs in the OR and to identify a time-frame for cleaning them with a readily available hospital-grade chlorine disinfectant to mitigate cross-contamination in the OR.

OBJECTIVES

To identify the existing micro-organisms on uncleaned LRAs and TSs used in the OR. To assess a readily available hospi-

tal-grade cleaning solution's effectiveness. To allow further antimicrobial susceptibility testing on cultures micro-organisms. To establish guidelines for the recommended frequency of cleaning radiation protective garments used in the OR.

METHODS

The data will be collected on LRAs and TSs used in an OR of a private hospital located in Pretoria, Gauteng. There is a total of 49 LRAs (N) and 30 TSs (N) available. The researcher will make use of time-sampling and convenience sampling methods. A pilot study will be implemented to test and confirm the sampling process. The entire population will be used as the sample size, 49 LRAs (n) and 30 TSs (n). Each swab will be dipped in sterile saline. Swabs will be obtained in a 5cm x 5cm area on the front side of the LRA at the level of the naval, as this is the area that come in contact with most surfaces in the OR.4 The swabs for the TS's will also be obtained in a 5cm x 5cm area. The TS's will be swabbed on the front part in the middle since this is generally the part visible above the sterile gown. The baseline swab will be repeated to ensure validity. Swabbing will be obtained after 7 days, 3 days and 24 hours after cleaning. After each swab, the LRAs and TSs will be cleaned with a readily available hospital-grade chlorine disinfectant. All swabs will be sent to the laboratory for culturing using 5% sheep blood agar which will be streaked in a semi-quantitative manner. Each agar plate will be incubated at 35-37°C in 5% CO2 for 48 hours. Further antimicrobial susceptibility testing will be implemented to determine if the cultured micro-organisms are multi-drug resistant. The cultured colonies will then be identified using the Vitek Prime MS system.

RESULTS

Results will be entered into a table. Comparisons will be done. Descriptive and Inferential statistics will be used to calculate the results. All results will be presented in bar charts to display the changes over time, by surgery discipline.

CONCLUSION

Identifying how LRAs and TSs contribute to cross-contamination in an OR could aid in a better understanding of infection control and possibly limiting nosocomial infections in patients. As a result, post-operative complication rates of surgical procedures will decrease. This study will also establish if regular, effective cleaning of LRAs and TSs, with a readily available hospital-grade chlorine disinfectant reduces cross-contamination in the OR.

INSTITUTIONAL SUPPORT STRATEGIES TO PROMOTE COMPLIANCE WITH CONTINUOUS PROFESSIONAL DEVELOPMENT AMONGST SOUTH AFRICAN RADIOGRAPHERS

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INTRODUCTION

Effective April 1, 2025, mandatory continuous professional development (CPD) for licensure could prevent 38% of radiographers from practising, severely disrupting patient access to imaging services and student training. Prior research suggests that radiography institutions have a crucial role in CPD compliance. This study investigated institutional support for CPD among South African radiographers to understand how to mitigate these potential disruptions.

METHODS

A quantitative descriptive cross-sectional study was conducted. An online questionnaire was used to collect data from radiographers nationwide. A sample (n=171) of radiographers was drawn through total sampling. The radiographers' attitude towards CPD compliance, the role of institutions and the type of institutional support radiographers need were recorded.

RESULTS

In this study, the primary variables, paid time-off from work, CPD fee subsidy and data subsidy for internet access, affect radiographers' compliance with CPD. A positive correlation was found between paid time-off from work ($r = 0.9$, $P < 0.05$), CPD fee subsidy ($r = 0.2$, $P < 0.05$) and data subsidy ($r = 0.1$, $P < 0.05$). From n=171, 100% agree that compliance with CPD is

essential and institutional support is needed. The support strategy should include paid time-off from work (81%), 50% subsidy for the payment of CPD attendance fees (56%) and a minimum of 2GB monthly data allowance for online CPD (32%).

CONCLUSION

This study highlights the need to re-evaluate employee benefits for leave, training, and development. Recommendations are proposed for a holistic approach to empower CPD compliance among South African radiographers, thereby preventing service disruptions. These include innovative strategies to reform relevant sections of the Basic Conditions of Employment Act 75 of 1997, company CPD policies, employment contracts, and/or collective agreements.

PROFILE OF FORENSIC IMAGING SERVICES AT A TERTIARY HOSPITAL IN GAUTENG PROVINCE

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Sefako Makgatho Health Sciences University, South Africa

BACKGROUND

Forensic imaging is a specialised branch of medical imaging that plays a vital role in medico-legal investigations by identifying the extent of injuries and the cause of death. It is used globally to support justice and public health, aligning with the WHO's vision of health as complete physical, mental, and social well-being. In South Africa, where crime rates and the frequency of migration are high, the demand for forensic radiography is growing. Radiographers' knowledge of the application of and training in forensic imaging is scant. Despite its importance, some South African radiographers are reluctant to perform post-mortem imaging, citing emotional discomfort, lack of training, and unclear scope of practice. Moreover, some personnel conducting forensic imaging in state labs lack proper qualifications, violating safety regulations. Forensic imaging must be performed by trained professionals who follow ethical and legal standards. This study explores diagnostic radiographers' perceptions and experiences of forensic imaging at a tertiary public hospital in Gauteng, aiming to inform training and policy development.

AIM

The aim was to investigate the knowledge and profile of forensic imaging services at a tertiary hospital in Gauteng.

OBJECTIVES

The objectives were: to assess the depth of the knowledge of the indications for forensic imaging services among radiographers; to assess the types of forensic imaging services rendered at the study setting; and to fill the existing literature gap in South Africa.

METHOD

A cross-sectional descriptive survey was conducted in April 2025, using a self-administered questionnaire among radiographers at a tertiary hospital in Gauteng province. Ethical clearance was obtained from Sefako Makgatho Health Sciences University Research Ethics Committee (SMUREC). Raw data was coded, entered into Microsoft Excel and exported into STATA 17 software for analysis.

RESULTS

Out of the 54 eligible participants, 20 completed the questionnaires, yielding a response rate of 37%. The majority of participants (70%, n=14) were radiographers with more than 5 years of clinical experience: mean age of 36 years (SD=10.5 years). Half of them provided a single indication for forensic imaging as being to determine the cause of death. Only 10% (n=2/20) provided a maximum of three indications for forensic imaging, and these were participants with more than 5 years of experience but less than 10 years of experience, and who had never attended any forensic image course. Less than a quarter of the participants (20%, n=4) attended a forensic imaging course/webinar/seminar. These were newly qualified and seasoned radiographers. A quarter of participants (25%, n=5) had previously performed forensic imaging examinations on live and

deceased bodies to rule out the cause of death in infants and stillborn, and non-accidental injuries using mobile and general x-ray equipment. The examinations were performed throughout the day. Only 10% (n=2/20) of participants confirmed the availability of the protocol for forensic imaging, which included babygrams for paediatrics, and skull, chest, abdominal, pelvic, long bone, or as requested by the referring clinician for adults.

CONCLUSION

The study highlighted a knowledge gap of the indications for forensic imaging with outdated protocols. The findings underscore the need for training institutions to incorporate forensic radiography training and to develop standardised national protocols and induction programmes at the hospitals.

PATTERN RECOGNITION OF COAL MINE DISEASES: A POST-COMMUNITY SERVICE RADIOGRAPHER'S PERSPECTIVE

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BACKGROUND

Exposure to coal mine dust remains a serious occupational health risk and a leading cause of respiratory illness among coal mine workers. While mortality attributable to coal mine dust lung disease has declined, coal mine dust lung disease remains the leading cause of morbidity among coal mine workers. Coal mine dust lung disease (CMDLD) is a collection of respiratory conditions such as coal mine workers' pneumoconiosis, dust-related fibrosis, silicosis, and chronic pulmonary disease. Silicosis is a form of lung disease brought on by coal mine dust exposure. Coal workers' pneumoconiosis (CWP) is an occupational condition brought on by exposure to silica-free coal dust (washed coal). The illnesses that the majority are most familiar with are silicosis and pneumoconiosis, which affect coal workers. The nodules in CWP typically appear more granular and have less distinct borders than nodules in silicosis. One type of interstitial illness that affects coal miners is dust-related diffuse fibrosis. Long-term coal miners are more likely to have dust-related diffuse fibrosis, which appears as irregular opacities on radiographs. Chest x-ray remains the primary tool in the early detection, monitoring, and diagnosis of coal mine dust lung disease. Radiographers working at the mines play a crucial role in occupational health surveillance and should be well-versed in pattern recognition and image evaluation of the chest to minimise diagnostic errors and support staging of the diseases and timely clinical decision-making.

AIM

The aim was to profile the pattern of respiratory conditions brought on by long-term coal dust inhalation.

OBJECTIVE

To sharpen radiographers' pattern recognition skills in identifying radiographic signs of the common lung conditions associated with exposure to coal mine dust.

METHOD

An evidence-based pattern recognition skill by a post-community service radiographer between February and April 2025 was evaluated. A total of 1549 posterior-anterior (PA) chest x-rays were performed during this period; 52 were sent to the radiologist for reporting, based on the radiographer's findings to exclude CMDLD. There was no standardised template for evaluating radiographs. The ABCDEFGH method was used for systematic image evaluation to exclude abnormal patterns on radiographs: A for the airway, B for soft tissue and bones, and C for the heart, D for the diaphragm, E for exposures and effusions, F for foreign bodies, fissures, and lung fields, G for the gastric bubble and great vessels, and H for the mediastinum and hila area.

RESULTS

Of the 52 radiographs sent for reporting, 10 were reported as abnormal by the radiologist, and 6 were correctly identified

by the researcher as silicosis, PTB, and chronic obstructive pulmonary disease (COPD). Two were known TB cases for follow-up, and one was newly diagnosed silicosis. The majority of the workers had an average of more than ten years working underground at the coal mines and had never worked at any other mines that produced other minerals like gold, platinum, or diamonds.

CONCLUSION

Chest conditions associated with exposure to coal mine dust are not given as much attention in radiography undergraduate training. Radiographers working in the mines require a pre-employment induction and a regular refresher course in pattern recognition of common mine lung diseases to support timely clinical decision-making.

STRENGTHENING RADIOGRAPHY EDUCATION: ENHANCING WORKPLACE LEARNING DURING TIMES OF CRISIS

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BACKGROUND

Workplace learning is a fundamental component of radiography education, providing students with opportunities to develop clinical competencies, integrate theoretical knowledge with practical application, and prepare for professional practice. However, disruptions in clinical education can impact student preparedness, confidence, and overall learning experiences. This study explored the lived experiences of radiography students undertaking workplace learning. Guidelines and recommendations aimed at improving student support, communication, and well-being during clinical training are discussed. While the study was conducted in the context of the global health crisis, COVID-19, the proposed guidelines and recommendations hold long-term value for strengthening radiography education and training.

AIM AND OBJECTIVE

To investigate the lived experience of radiography students who undertook workplace learning in order to formulate guidelines and recommendations to improve student support, communication and well-being during clinical training.

METHOD

A qualitative phenomenological research approach was adopted to explore the lived experiences of fourth-year diagnostic radiography students. Ethics approval was obtained, informed voluntary participation ensured, and all data were treated with strict confidentiality. Purposive sampling was employed. Data were collected via both face-to-face and online unstructured focus group interviews until data saturation was achieved. Data analysis via thematic analysis was applied to generate themes, which resulted in the development of guidelines and recommendations aimed at enhancing workplace learning.

RESULTS

Four overarching themes were created from the data collected through the four focus group interviews. Guidelines associated with these themes were subsequently developed: facilitation of an induction programme to ease students' transition into workplace learning; promotion of effective communication among stakeholders; and the provision of support mechanisms to enhance student well-being. A structured induction programme can incorporate psychological support and prepare students to navigate clinical training challenges, supporting a smoother transition into workplace learning. Promoting open and effective communication among students, academic staff, and clinical partners can strengthen collaboration, foster transparency and cultivate a positive learning environment. Support from family, peers, and educators proved instrumental during crisis periods. Additional initiatives such as wellness spaces, extracurricular activities, and reflective practice can enhance coping strategies and overall well-being in clinical settings. The findings also highlight the value of innovative tools, such as virtual reality, to supplement clinical training during periods of limited clinical exposure.

CONCLUSION

The study underscores the need for adaptable, student-centered approaches to support effective workplace learning dur-

ing times of crisis. The key takeaways from the proposed guidelines include the importance of improving student preparedness, fostering open collaboration among stakeholders, and enhancing overall training outcomes. Specific recommendations include emotional intelligence training for clinical radiographers to strengthen empathy and support for students; resilience training for students to develop effective coping strategies and adaptability in facing challenges; PPE training to better equip students for clinical environments; student debriefing sessions to provide students with an outlet to share and reflect on their experiences; and regular stakeholder meetings to encourage transparency and address challenges proactively. By implementing these strategies, higher education institutions can cultivate more resilient and supportive learning environments for radiography students. While designed in response to a crisis, these recommendations have broader applicability and practical implications for advancing radiography education and training, strengthening student support, and ensuring students are well-equipped for the evolving demands of clinical practice and service delivery.

RADIOGRAPHIC AGE ESTIMATION METHODS: A REVIEW TO ENHANCE FORENSIC AND ANTHROPOLOGY ANALYSES

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BACKGROUND

Age estimation is one of the human identification methods used in forensic imaging for civil and criminal proceedings, mass disasters, and anthropological studies. The increasing frequency of mass disasters and cross-border migration underscores the need for accurate age estimation, given the significant implications of age on human rights. CT and MRI have emerged as advanced modalities in age estimation with improved diagnostic accuracy. These modalities are not yet readily available in state hospitals in South Africa due to long waiting periods. The lack of dedicated forensic imaging institutions in South Africa hampers the ability to deliver high-quality forensic imaging services, effectively manage mass disasters, and support anthropological investigations. Plain radiography remains the gold standard for age estimation in forensic investigations due to its widespread availability, non-invasive nature, rapid results, and excellent diagnostic image quality. Forensic pathologists now primarily rely on forensic imaging with Lodox equipment. This technology guides and augments autopsies for improved diagnostic accuracy and also serves as a substitute in situations where autopsies cannot be performed due to cultural and religious reasons. Lodox equipment provides quality plain skeletal radiographs and is efficient in mass disasters. Radiographers' proficiency in diverse age estimation methods is crucial for accurately evaluating images. This expertise helps prevent errors in patient identification and the misinterpretation of age-related findings, both in standard clinical settings and during mass disasters.

AIM

To describe the various age estimation methods used in forensic and anthropological investigations.

OBJECTIVES

To enhance radiographers' image evaluation competencies in forensic age estimation, in order to strengthen forensic imaging services, and legal and anthropological investigations.

METHOD

A systematic review of peer-reviewed articles containing age estimation methods was conducted, with the search words containing forensic imaging age estimation methods. The search was narrowed to include plain general radiographs. Reports on the skull, wrist/hand, elbow, dental, and proximal femur were excluded as these are well-covered in radiography textbooks. CT and MRI were also excluded since these modalities are not readily available for forensic imaging services in South Africa.

RESULTS

There are several well-established age estimation methods using different anatomical regions, such as the mandible, humerus, clavicle, chest, iliac crests, knee, and foot/ankle, which were included in the analysis. Several factors can affect the

accuracy of age estimation, including genetic factors, gender, and race. Using multiple anatomical regions can improve the accuracy of age estimation. The current age estimation methods are standardised based on specific racial or ethnic groups. Although their application in modern emerging interracial and ethnically diverse populations may be limited, they provide a foundational framework.

CONCLUSION

There is a growing need for forensic imaging for age estimation to support civil, criminal, and anthropological investigations. The diagnostic accuracy and application of current age estimation methods can be enhanced in interracial and ethnically diverse populations. Multiple anatomical regions can be assessed simultaneously to enhance precision age estimations from Lodox images. The quality of Lodox images around those anatomical regions commonly used for age estimation should be assessed to improve accuracy and enhance forensic imaging services, especially in mass disasters.

ADVANCING RADIOGRAPHY THROUGH INTERNATIONAL COLLABORATION: SOUTH AFRICAN AND SWEDISH EXPERIENCES

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INTRODUCTION

Collaboration between professional societies and universities is key to advance education and research. The presenter was invited by Dr Andersson to take part in the Radiology Week, Örebro, Sweden, September 2024, meet the Swedish Society of Radiographers (SFR) and visit clinical training sites. Research and shared insights into radiography education from the Central University of Technology, Free State (CUT), South Africa, were presented.

DISCUSSION OF THE COLLABORATION

An overview was presented of international radiography programmes during an education session, where innovative teaching strategies were shared, including the use of simulation and image banks during the COVID-19 pandemic. A presentation, on optimising computed tomography (CT) image quality for maxillofacial prosthesis manufacturing sparked interest, particularly in the innovative approach of reverse engineering in medical imaging. Discussions at the SFR's booth provided opportunities to exchange ideas with international radiographers, revealing both similarities and differences in radiography practices. A visit to Lund University's Faculty of Medicine included meetings with lecturers, researchers and students, where the CUT radiography programme was discussed alongside a research presentation. At Skåne University Hospital, insights were gained into their radiography workplace learning environment. Discussions at the hospital's 3D printing lab focused on software solutions for segmentation and CAD. The visit culminated in formulating an MOU between CUT and Lund University, paving the way for staff and student exchanges and fostering future collaborations.

CONCLUSION

The collaboration led to successful outcomes and promising developments. It also offered multiple benefits, such as improved research opportunities, promotion of continuous professional development, exploring innovative practices in radiography education and fostering meaningful international partnerships.

STUDENT PERCEPTIONS OF EDUCATIONAL VIRTUAL CLASS COLLABORATIONS BETWEEN A SOUTH AFRICAN AND EUROPEAN UNIVERSITY

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INTRODUCTION

Radiographers are responsible for ensuring patient safety and maintaining ethical standards during medical imaging. In 2024, the Central University of Technology in South Africa, and Lund University, Sweden, arranged collaborative educational virtual classes for students of the two universities to discuss scenarios on two key areas in radiography: "patient safety" and "ethics of care from a global perspective".

AIM

The aim was to determine radiography students' perceptions of educational virtual class collaborations.

METHODS

After the virtual classes, first-year (n=88) and second-year radiography students (n=80) completed an online survey. The survey consisted of nine questions focusing on the technical issues, participation levels, enjoyment, and learning outcomes, measured using a five-point Likert scale. Additionally, two open-ended questions were included, allowing students to share comments about their experiences and offer suggestions for improvement.

RESULTS

More than 80% of students shared opinions during virtual classes. Furthermore, >80% agreed, and strongly agreed to the nine statements in the survey. It emerged from the open-ended responses that the students of the two universities shared similar ethical values in radiography. Additionally, they expressed that more time was needed to engage with their peers. They suggested that smaller groups would foster more effective and productive discussions.

CONCLUSION

Virtual class collaborations between universities in different hemispheres can promote global knowledge exchange and enhance students' ability to apply best practices in radiography.

REAL-WORLD CONFIRMATION OF IMAGE QUALITY CT PARAMETER SETTINGS FOR THE DESIGN AND MANUFACTURING OF FACIAL PROSTHESES

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INTRODUCTION

Facial deformities in individuals can result from a range of diseases and accidents. Common contributing factors include cancer and traumatic incidents such as car accidents, assaults, and burn injuries. Patients with significant facial disfigurements experience not only psychological distress but also social stigma. These individuals frequently need facial reconstructive surgery and custom-made prostheses to enhance their aesthetics. Creating a facial prosthesis necessitates precise anatomical data acquired through computed tomography (CT) imaging, which is essential for the 3D printing of the prosthesis. Inadequate CT images can lead to incorrectly sized or ill-fitting prostheses, potentially resulting in further

trauma, additional imaging, increased radiation exposure, and higher costs. In a previous study, 11 high-image-quality stereolithography (STL) files were distinguished from a set of 35 using STL measuring criteria and used to identify potential CT parameter setting values and ranges for high-image-quality CT scans.

AIM

The aim was to test these settings in a close-to-real-world setting by scanning an anthropomorphic phantom and confirming the settings on a dry human skull.

MATERIALS AND METHODS

Several test protocols were formulated by combining different potential parameter setting values, which included values for mA, kV, slice width, slice height, pixel size, algorithm, reduction, orientation, FOV, gantry tilt, number of slices, slice increment and slice thickness. A total of 36 protocols were tested on the phantom, of which 18 applied the Bone algorithm and 18 the BonePlus. The 36 digital imaging and communications in medicine (DICOM) files were then converted to STL files. An expert team evaluated these STLs based on visual acuity by evaluating three anatomical reference points: delineation of the cranial sutures, any set of the cranial foramina, and the teeth. The STLs were then grouped into four groups: ' excellent', 'good', 'fair', and 'worst'. The CT parameter settings used to produce the 'excellent' and 'good' groups of STLs were then confirmed on a dry human skull. After converting the resulting DICOM files from the dry skull into STLs, they were evaluated by the expert team using a rubric to evaluate their visual acuity.

RESULTS

Of the 36 STLs generated from the anthropomorphic phantom, 5 were categorised as 'excellent', 12 as 'good', and the remaining 19 as 'fair' and 'worst.' The parameter settings of all 17 excellent' and 'good' STLs were confirmed on the dry skull as CT settings that will produce high-quality STLs the design and manufacturing of facial prostheses. Taking radiation dose into account, the adjustable CT parameters settings identified in this study were 120 kilovolt (kV), auto milliamperes (mA), 20 - 26 cm DFOV, 0.625 - 1.25 mm slice thickness, 20 mm interval, and bone algorithm.

CONCLUSION AND SIGNIFICANCE

Applying these CT parameter settings should produce high-quality STLs, resulting in correctly sized and well-fitting prostheses, limiting the trauma that patients may suffer from repeated fittings.

WORKPLACE REALITIES. EMOTIONAL WELL-BEING AND RESILIENCE AMONG SOUTH AFRICAN DIAGNOSTIC RADIOGRAPHY STUDENTS

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INTRODUCTION

A significant component of radiography education is workplace learning as part of work-integrated learning. While studies about the structure, characteristics and coping mechanisms of workplace learning exist, diagnostic radiography students' emotional well-being during workplace learning remains unexplored. Support from academic and workplace supervisors is essential for effective workplace learning. Supervisors monitor students by assessing the students' perception of the difficulty of allocated tasks, encouraging reflection, providing formative feedback and ensuring students can deal with a variety of situations. In addition, academics and clinical supervisors need to foster the development of self-learning skills and strategies, as well as identify and help students resolve conflicts and deal with stressful experiences. Studies also show a correlation between clinical supervisors and students' stress and anxiety levels. Durban radiography students reported

that a respectful, inspirational and supportive relationship with their clinical supervisor was essential to productive learning during workplace learning placements. Clinical supervisors who are compassionate and consider their students varied lived experiences can respond appropriately to challenging situations to promote their students' self-esteem and well-being. Therefore, researchers undertook a national study to explore South African diagnostic radiography students' emotional well-being during workplace learning.

METHOD

An online survey was utilised. The survey contained quantitative and qualitative questions. Permission was granted from 5 higher education institutions in South Africa. Recruitment was via the online learning system at each institution. The stories and experiences shared in the open-ended questions sparked concern. These findings have therefore been extracted to share with radiographers to promote awareness in the workplace.

RESULTS

The qualitative data showed six overarching themes that were developed from the data: stressful encounters, challenging interpersonal relations, effects on emotional well-being, interventions to promote emotional well-being, resilience building, and the reality of SA radiography student life. Students shared experiences of sexual harassment, body shaming, bullying, evidence of a toxic working environment and reservations about their career choice. Some demonstrated resilience and pushing through as coping mechanisms. Suggestions were made for the inclusion of a psychology module in the undergraduate curriculum as well as easier access to counselling services.

CONCLUSION

It is evident from the findings of this study that a proactive approach to supporting students' well-being is needed. A collaborative partnership between radiography and counselling teams is required to facilitate healthy coping mechanisms among students. There is also a need to highlight workplace challenges to clinical radiographers to bring about awareness of what students encounter to safeguard them from future threats of harassment and bullying.

GENERATING STATISTICS AND PATIENT DATA FROM PACS

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BACKGROUND

Administration processes are required in radiography settings. In terms of this proposal, the time spent on the administration part and calculating the daily, weekly and monthly statistics can be greatly reduced. Clinicians and radiographers can spend more time with the patients and examinations. This method can improve the throughput of patients in the X-ray department.

PROPOSED METHOD BENEFITS

In the past, radiographers had to write the patients' details in a register/records book, a book. Recent protocols of patient data are completed electronically on a computer. With this improvement in service flow, radiographers accept X-ray request forms. They then X-ray each patient with the patient's details on the PACS (Picture Archiving and Communication System). Because patient information, examination, radiographer details and other information are contained in the DICOM header, with the DICOM files on the PACS system, this system can automatically derive the register and calculate the monthly statistics. The latter will include the radiographer's name, examinations, and projections. The DICOM header information is required for departmental statistics.

The benefit of the system is that it can reduce the waiting time in the X-ray department. It should also improve service delivery, less paperwork for radiographers, improve the accuracy of the monthly statistics, provide an electronic register, improve patient satisfaction, improve patient-centered service and work satisfaction. Each radiographer manager will have an updated departmental statistical review as needed. With this method change management processors are required.

INVOLVEMENT OF RADIATION THERAPISTS IN DISCUSSING SEXUAL HEALTH CHALLENGES WITH PATIENTS

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INTRODUCTION

Patients receiving radiotherapy for prostate cancer experience sexual health challenges that affect their quality of life. Radiation therapists are expected to inform patients treated for cancer about the side effects of radiotherapy during counselling sessions. However, there is limited emerging research and literature supporting the involvement of radiation therapists in discussing sexual health challenges with patients with cancer as part of routine care.

AIM AND OBJECTIVE

This study investigated the involvement of radiation therapists in discussing sexual health challenges with patients receiving radiotherapy for prostate cancer. The objective of this study was to improve person-centred care in radiation oncology settings.

METHODS

A cross-sectional survey was used. The target population comprised 60 radiation therapists, with a calculated sample size of 50. Convenience sampling was used to recruit participants. Data were collected from 1 September to 30 November 2021 using a paper-based questionnaire to collect quantitative and qualitative responses. Data were analysed using descriptive and inferential statistics in SPSS V29 and thematic analysis supported by ATLAS.ti 23. Ethical approval and site permission were obtained for this study.

RESULTS

Forty-eight respondents completed and returned the questionnaire for analysis. It was found that 64.6% of the respondents attempted to address men's sexual health concerns during radiotherapy for prostate cancer. Statistical analysis found no significant association between gender and avoidance of sexual health conversations (p=0.1809), or between work experience and respondents' involvement in facilitating these conversations (p=0.6257). Four themes were identified and interpreted.

CONCLUSION

Radiation therapists acknowledged the importance of providing person-centred counselling to patients receiving radiotherapy for prostate cancer. They also expressed a lack of confidence and skill in initiating sexual health conversations with patients.

ESTABLISHING CLINICAL INDICATION-BASED PAEDIATRIC DIAGNOSTIC REFERENCE LEVELS FOR ABDOMINAL CT EXAMINATIONS

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BACKGROUND

Diagnostic reference levels (DRLs) are to ensure that radiation doses during CT imaging are kept within safe and optimised ranges, particularly for paediatric patients, who are more vulnerable to radiation exposure. Currently, there is a paucity of

research addressing DRLs tailored to clinical indications such as nephroblastoma, highlighting the significance of this study in the context of paediatric radiological practice.

AIM

The aim of the study was to establish clinical DRLs for contrast-enhanced abdominal CT examinations in paediatric patients diagnosed with nephroblastoma.

METHODS

A descriptive, quantitative approach was used to retrospectively analyse data from 120 paediatric patients who underwent abdominal CT scans. Variables investigated included volume CT dose index (CTDIvol), dose length product (DLP), and size-specific dose estimate (SSDE), with SSDE calculated based on anterior-posterior (AP), lateral (LAT), sum (AP+LAT), and effective diameter dimensions. In line with ICRP (International Commission on Radiological Protection) guidelines, patients were divided into five weight categories. Group 1 (0–<5 kg), Group 2 (5–<15 kg), Group 3 (15–<30 kg), Group 4 (30–<50 kg), and Group 5 (50–<80 kg).

RESULTS

Due to insufficient sample size in weight Groups 1, 4, and 5, DRLs were only calculated for Groups 2 and 3. CTDIvol values ranged between 2.4 and 2.8 mGy for these two groups, while DLP values ranged from 78.4 to 118.3 mGy•cm. SSDE values, derived from the AP, LAT, SUM, and effective diameter metrics, ranged between 5.1 and 5.9 mGy. The use of SSDE in this context allowed for a more personalised estimation of radiation dose by taking patient size into account, offering a more precise alternative to traditional dose metrics.

CONCLUSION

This study provides essential baseline data for the development of clinical paediatric DRLs for abdominal CT examinations specific to nephroblastoma. The results highlight the necessity of incorporating patient size and clinical indications into DRL development. Expanding data collection, especially in underrepresented weight groups, and encouraging collaboration across institutions could further support the development of comprehensive, standardised DRLs for paediatric imaging.

EMPOWERING AUTONOMY IN POSTGRADUATE SUPERVISION: A REFLECTIVE STUDY ON THE DEVELOPMENT OF AN INTERACTIVE STUDY GUIDE FOR POSTGRADUATE STUDENTS

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INTRODUCTION

This reflective study explores the conceptualisation and implementation of a structured postgraduate study guide titled “Guiding Postgraduate Students during the Proposal Development Phase: Working towards Autonomy” within the School of Healthcare Sciences at the University of Pretoria. Responding to the need for equitable and consistent supervisory practices across five health disciplines, the guide is grounded in the "Prepare, Engage, Consolidate" pedagogical model, aligning with the university’s emphasis on self-directed and inquiry-based learning. Postgraduate supervision models are undergoing transformation globally to emphasise autonomy, critical thinking, and research integrity.

DISCUSSION

The development of this guide reflects and supports this paradigm shift by fostering student independence while ensuring structured support. The guide will assist postgraduate students in developing the confidence and skills necessary to manage their research process independently, while also supporting supervisors who are still building experience within the department by offering a clear, evidence-based framework for guiding proposal development. As research has become a compulsory component of postgraduate education, the guide ensures both parties are aligned in expectations and aca-

demic standards. Embedded rubrics, online resources, and reflective checkpoints facilitate both student accountability and supervisor feedback. This initiative promotes fairness and transparency. It also redefines the supervisory relationship by shifting from a directive to a facilitative model, ultimately cultivating research autonomy, academic confidence, and long-term scholarly competence.

CONCLUSION

The study highlights the critical intersection between structured support and reflective supervision in enhancing postgraduate education and research capacity.

A STEP-BY-STEP APPROACH TO CALCULATE CLINICAL INDICATED DIAGNOSTIC REFERENCE LEVELS FOR ABDOMINAL COMPUTED TOMOGRAPHY EXAMINATIONS

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BACKGROUND

Diagnostic reference level (DRL) values are used to optimise radiation dose during medical imaging. Computed tomography (CT) is one of the imaging modalities that use high radiation dose. Thus, having CT DRL values is vital. Clinical-indicated DRL values are a more reliable representation of the different CT examinations as compared to anatomical DRL values. Radiographers form part of the dose and image quality optimisation (DIQO) team according to the International Commission on Radiological Protection (ICRP). Thus, radiographers should know how DRL values are calculated.

AIM

The aim of the study is to present a step-by-step approach radiographers can use to establish DRL values for abdominal CT examinations.

METHODS

The most common clinical indication for CT abdominal examination should be identified. The volumetric CT dose index (CTDIvol) and dose length product (DLP) are the standard dose quantities used to calculate CT DRL values. Once the dose quantities have been documented, the DRL values are calculated either on the typical values (median) or the 75th percentile according to the ICRP guidelines. A minimum of 20-30 patients are required per clinical indication to compile the DRL values.

INTENDED IMPACT

Radiographers operating at the CT modality will have a better understanding of the development of clinical-indicated CT DRL values. Furthermore, radiographers will have knowledge of how clinical-indicated DRL values are established which will align radiology departments with international guidelines to develop DRL values for the most common performed CT examinations.

CONCLUSION

Having clinical-indicated DRL values for CT abdominal examinations has the potential to ensure radiation dose is reasonably distributed.

IMAGE QUALITY EVALUATION DURING THE DIAGNOSTIC REFERENCE LEVEL (DRL) PROCESSES FOR COMPUTED TOMOGRAPHY EXAMINATIONS

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BACKGROUND

When diagnostic reference level (DRL) values are calculated, it is important that the image quality is also assessed as part of the DRL process. Even though it is important to optimise dose during imaging, the image quality should not be compromised.

AIM

The aim of the study was to evaluate the image quality of the computed tomography (CT) examinations as part of the process of the establishment of DRL values.

METHODS

Patients who were scheduled for CT examinations at two radiology practices formed part of the study. CT abdomen-pelvis (AP) and chest-abdomen-pelvis (CAP) examinations were included in the study. The sample size of the study was 403 patients. An image subtraction algorithm was used to evaluate the image quality of the CT AP and CAP examinations. The image quality value was expressed as the average standard deviation standard deviation of the Hounsfield unit (HU).

RESULTS

The image quality ranged from 6 - 11.2 and 10.2 - 13.9 HU at the two respective radiology practices. The image quality index varied among the classes of body mass index (BMI) and for the different clinical protocols. Significant differences ($p<0.05$) in the image quality were noted between the two practices for CT CAP and AP examinations.

CONCLUSION

The quality of the CT images was clinically satisfactory and contributed towards the diagnosis of the patient. When the DRL values are established, the image quality should also be assessed to ensure optimal imaging and dose optimisation.

DOH RESOURCE SHORTAGES IMPACT ON DIAGNOSTIC RADIOGRAPHY STUDENT TRAINING

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PURPOSE

To explore how resource constraints within KwaZulu-Natal (KZN) Department of Health (DOH) clinical training sites impact the effectiveness of work-integrated learning (WIL) for diagnostic radiography (DR) students from the Durban University of Technology (DUT).

OBJECTIVE

To explore the collaboration between the DUT and clinical industry partners, in terms of diagnostic radiographers WIL with the overarching aim to facilitate positive collaboration between stakeholders and improve students' clinical competency.

METHOD

A qualitative, explorative approach was used. Semi-structured interviews were conducted with university staff and clinical industry stakeholders directly involved in radiography student training. Data were analysed thematically and guided by a conceptual framework to understand how resource limitations shape collaboration and clinical training.

RESULTS

Participants highlighted chronic resource shortages within DOH facilities, including outdated or malfunctioning imaging equipment, limited access to advanced modalities, and staff shortages. These are all significant barriers to effective clinical training. Overcrowding of WIL sites, driven by increased student numbers and fixed placement capacities, further diluted hands-on learning opportunities. Literature underscores that DR clinical competency hinges on effective clinical training, the severe lack of learning resources creates a gap in learning which compromises authentic clinical training. Clinical tutors reported difficulty balancing service delivery with teaching due to workload pressures, hindering their capacity to train students. Stakeholders recognised that while individual commitment and informal problem-solving helped to partially offset these challenges, systemic resource limitations undermined student preparedness for clinical practice.

CONCLUSION

Resource constraints in DOH clinical sites have a direct, detrimental impact on the quality and consistency of DR students' clinical training. Addressing these challenges requires improved collaboration between university and clinical stakeholders. Strategies such as diversifying clinical placement sites, formalising stakeholder roles, and jointly developing adaptive training plans can help mitigate the impact of resource shortages.

FUTURE OF RADIOTHERAPY: THE ROLE OF ARTIFICIAL INTELLIGENCE (AI) IN CANCER CARE

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AIM AND OBJECTIVE

To address the headway being made in the world of radiotherapy by reviewing the key roles that existing technology can play, currently as well as in the future in clinical settings. The impact of AI in daily clinical practice will also be reviewed.

DESIGN & METHOD

Radiotherapy is one of the dynamic fields that has driven innovation with high technology infrastructure. It is one of the key factors for the effectiveness of cancer treatments currently, and in the future. Another important reason for innovation in radiotherapy is to improve patient outcomes. The presentation covers the insights of adaptive treatments, automation of treatment planning approaching a reality, the status of AI auto segmentation in clinical workflows, and what is coming next in AI development for the radiotherapy field.

RESULTS

With technology like auto contouring for more efficient, consistent and accurate auto segmentation, AI enabled workflows can speed up the treatment planning process and ensure highly personalised treatments Adaptive planning workflows are improving patient outcomes with more conformal treatment and reduced side effects. The adapted planning workflows also play a pivotal role with re-irradiation.

CONCLUSION

AI is paving the way for more accurate and efficient diagnoses with earlier detections. It is transforming clinical workflows with substantial potentials, and like many advancements, limitations as well. The implementation and use of AI optimised workflows in more radiotherapy units across South Africa should be encouraged. This implementation, however, is often met with challenges like training, staff shortages and inconsistencies with data collection, highlighting the need for more efficient implementation strategies.

OPTIMISING RADIATION DOSE IN DIGITAL MAMMOGRAPHY: ESTABLISHING LOCAL DIAGNOSTIC REFERENCE LEVELS

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BACKGROUND

Diagnostic reference levels (DRLs) are a crucial tool for optimising radiation doses in medical imaging procedures, ensuring that patients receive the lowest possible radiation exposure while maintaining the necessary image quality for accurate diagnoses. There is a notable absence of published DRL values specifically for mammography in South Africa. Given that breast tissue is highly sensitive to ionising radiation, it is essential to establish local DRL values to guide radiographers in selecting appropriate exposure settings. Doing so enables practitioners to strike a balance between minimising radiation risk and acquiring high-quality mammograms that allow for reliable disease detection, particularly in breast cancer screening and diagnostic procedures.

AIM

This study aimed to establish local DRL values for digital mammography in two practices by evaluating radiation dose exposure at these selected radiography practices. The goal was to determine standardised benchmarks that could be used to optimise mammography protocols and enhance patient safety while preserving image quality.

METHODS

A retrospective study design was employed, incorporating a quantitative research approach. To facilitate data collection, a structured data recording sheet was developed and validated against existing literature to ensure consistency and reliability. This tool was used to extract critical variables related to digital mammography procedures from two radiology practices.

Patient-related data included the age of patients undergoing mammography, as age has been identified as a factor influencing breast tissue composition and sensitivity to radiation exposure. Additionally, technical parameters retrieved from mammography units encompassed key elements such as the mean glandular dose, anode filter combination, breast projections, compressed breast thickness, exposure settings, and applied compression force. Each of these factors plays a pivotal role in determining the radiation dose administered during mammography. Image quality assessments were conducted as part of the data collection process, using an established evaluation system that categorises mammography images into four quality levels: Perfect, Good, Moderate, and Inadequate. By correlating image quality with radiation dose metrics, the study aimed to ensure that DRL values were not only minimised for safety but also optimised for diagnostic accuracy.

RESULTS

The study successfully derived DRL values for digital mammography at the two selected radiology practices. Findings revealed that both the compressed breast thickness and the age of the patients influenced the radiation dose recorded during imaging. Variations in image quality across the two practices were considered when calculating the DRLs for the practice, highlighting the importance of tailoring exposure settings to individual patient characteristics.

Following analysis, local DRLs were determined based on practice-specific DRL values. These benchmarks are intended to serve as a reference for optimising mammography procedures across various healthcare facilities in the Free State and Northern Cape provinces of South Africa, promoting standardised yet adaptable protocols that prioritise patient safety while maintaining diagnostic efficacy.

CONCLUSION

A comparison between the derived local DRL values and internationally published DRLs for digital mammography was performed. Findings provided valuable insights that were conveyed to the participating radiology practices, where DRL implementation measures were initiated. The adoption of these DRL values represents an ongoing process that requires periodic evaluation to ensure continuous improvements in radiation dose optimisation and image quality enhancement. By initiating a structured framework for monitoring and refining mammography exposure settings, this study contributes to advancing breast imaging standards and promoting safer, high-quality diagnostic practices within the mammography radiography landscape.

RADIOLOGICAL TECHNOLOGISTS IN FORENSIC PRACTICE: MULTIDISCIPLINARY INNOVATIONS IN POSTMORTEM IMAGING AT A NON-UNIVERSITY AUTOPSY CENTER

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BACKGROUND

In Japan, forensic examinations are generally conducted at university hospitals or medical examiner's offices. The Tsukuba Medical Examiner's Office (Autopsy Center), operated by Tsukuba Medical Center, is the only non-university hospital-based facility in the country dedicated to autopsies of non-criminal, unnatural deaths. This setting enables a unique, multidisciplinary approach to forensic investigations, characterised by close collaboration between radiological technologists (RTs) and forensic pathologists. The center emphasises accurate diagnosis as well as innovation in imaging protocols and workflow, with RTs playing an increasingly active role in technical and procedural development.

AIM AND OBJECTIVES

The aim of the study was to characterise the evolving roles of RTs within the field of forensic medicine. The objectives were: to describe RTs' operational responsibilities; to highlight the development and application of novel imaging techniques introduced by RTs; and to illustrate RTs' engagement in educational and professional forensic communities.

METHODS

A retrospective review was conducted using internal records, imaging protocols, and workflow documentation accumulated over the past decade at the Autopsy Center (AC). The analysis focused on RT involvement in postmortem (PM) imaging practices, technical innovations, implementation of structured checklists, contributions to quality improvement, educational initiatives, and participation in external professional activities. Key workflow components reviewed included PMCT acquisition, image processing, preliminary examinations, interpretation support, and collaboration with radiologists during final diagnoses.

RESULTS

There are 6 RTs involved in forensic imaging services at the AC. One technologist is assigned to the AC day. Their roles include the following.

- Specialised imaging techniques. RTs developed a range of techniques specifically adapted for forensic needs. Fused CT imaging, taking advantage of cadaver immobility, allows for multi-phase image acquisition without requiring specialised fixation techniques. It is primarily used to evaluate intravascular thrombi, atherosclerotic plaques, and vessel wall characteristics. RTs adjust scanning parameters, including slice thickness and reconstruction algorithms, based on forensic objectives. Additional techniques include posterior cervical extension positioning, which expands the anterior intervertebral disc space. This positioning is used to reveal signs suggesting anterior longitudinal ligament rupture, disc injury, or endplate avulsion fractures. PM and antemortem CT comparisons are facilitated by subtraction imaging focused on ethmoid sinus morphology. PM MRI is selectively used, especially in pediatric or spinal trauma cases, typically during off-peak clinical hours.
- Structured checklists for preliminary image review. To compensate for the inevitable time lag before radiologists provide their final remote interpretations, RTs conduct systematic preliminary assessments of PMCT scans using standardised checklists. These findings assist forensic pathologists in their initial evaluations and help ensure no critical details are overlooked during the interim.
- Collaboration, education, and external contributions. RTs actively participate in interdisciplinary discussions, contribute to imaging protocol development, and support the training of junior staff. One RT serves as the representative of the Ibaraki Autopsy Imaging Study Group and participates in the Ibaraki Prefecture Council for Promoting Cause of Death Investigation. Through this role, the RT fosters close cooperation with external institutions and strengthens inter-organisational networks that support forensic imaging practices in the region.

CONCLUSION

Radiological technologists at the AC are integral contributors to the advancement of forensic medicine. Their expertise, innovative practices, and commitment to education and collaboration significantly enhance the effectiveness and credibility of postmortem imaging. The integrated, interdisciplinary model developed at this center exemplifies how RTs can elevate the standards of forensic investigations on a broader scale.

RADIATION SAFETY CULTURE MEASURED IN A THEATRE WITH THE SAVVYRAD APP

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BACKGROUND

The occupational radiation safety culture was researched and evaluated (2019-2021) with an audit checklist at three cath labs for optimal compliance, especially regarding wearing dosimeters, protective devices, methods to optimise occupational radiation protection and exposure to the eyes, thyroid, hands, and feet of the team.

The audit checklist tool successfully determined areas at each site where improvements are needed to optimise the safety culture in terms of the radiation protection principles of distance, time, shielding, and dose monitoring. The practical site recommendations of one site will be shared.

AIM AND OBJECTIVES

To maintain and optimise a radiation safety culture, using a mobile application to engage all staff in a regular review process.

METHODS

1. The standards of the radiation safety-culture audit checklist criteria were bench-marked to measure the radiation safety culture (habits).
2. The checklist was converted into a mobile application (2021-2023) with report features by involving application specialists and physicists.
3. The mobile application was piloted at three sites. A dedicated administrator (radiographer/ cardiologist) accessed all the reports embedded in the application.

RESULTS

1. The mobile application engaged all staff in a regular review of measurable actions, recording technical factors such as tube angulation, exposure factors, distance from the x-ray source, fluoroscopy duration, and lead shielding thickness. The dose was measured with real-time dosimeters.
2. The staff received feedback to indicate compliance through a progress meter on the application.
3. The progress meter indicated the gaps in radiation protection actions and occupational exposure monitoring during interventional procedures.
4. The results tracked the progress of distance, time, shielding, and dose monitoring.
5. The satisfaction survey indicated awareness of daily radiation safety habits and radiation exposure to staff.

CONCLUSION

By engaging all staff, the application can improve compliance, and maintain real-time optimisation of radiological techniques, and best practice radiation safety techniques.

RADIOGRAPHIC CRITIQUE ONLINE TRAINING

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BACKGROUND

The goal of the diagnostic radiographer is to take optimal radiographic images that can be evaluated by a definable standard described as evaluation criteria. The evaluation criteria refer to the inclusion of the relevant anatomical structures, correct exposure factors and correct positioning. Positioning is critiqued by evaluating the alignment, rotation and tilt of the structure related to the image receptor. This critique is often referred to as "pass". The researchers identified a need to link the theory of evaluation criteria with the radiographic images in clinical practice.

AIM AND OBJECTIVES

The aim is to train radiographers and radiography students to be competent in radiographic critique. The objective was to design online training and assessment to enhance the teaching and learning experience. The online tool will be presented by providing an example of one radiographic projection.

METHODS

1. Summarise the radiographic evaluation criteria of a variety of radiography resources.
2. Create a mnemonic to align with the evaluation criteria.
3. Design online training with hyperlinks to theory and radiographic images.
4. Present the benefits of the tool.

RESULTS

1. Website development of the training 2015-2024 under the name RADCRIT.
2. The SPICERAT mnemonic was developed to critique radiographic images.
3. Hyperlinks were created between theory and radiographic images.
4. Training available online for radiographers to earn CEUs.
5. Student training and assessment are available online with lecturer administration and reporting features.

CONCLUSION

The SPICERAT tool on the RADCRIT website assists professionals and students in recapping previous knowledge, or to drill and practice critique skills.

KNOWLEDGE AND SKILLS TRANSFER IN THE CLINICAL ENVIRONMENT BETWEEN DIAGNOSTIC RADIOGRAPHERS AND STUDENTS

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BACKGROUND

The effective transfer of knowledge and skills between diagnostic radiographers and students is crucial for professional development and optimal patient care. However, understanding the factors influencing this transfer is limited within the diagnostic radiography profession. The primary aim of this paper is to share factors affecting knowledge and skills transfer

between diagnostic radiographers and students. The proposed solutions to overcome the identified barriers to knowledge and skill transfer, as experienced by diagnostic radiographers and students, are described.

METHODOLOGY

A qualitative design was used, and the study was conducted in the Free State province of South Africa. The study included three clinical training sites and one higher education institution. Semi-structured interviews were conducted with 15 participants. The participants included radiographers, student radiographers and community service radiographers. The interview schedule included discussion points such as preferred methods for acquiring knowledge from colleagues in the workplace, factors influencing receptiveness to shared tips and lessons, preferred methods for acquiring necessary skills from colleagues, and suggestions for improving relationships between students, community service radiographers, and radiographers. The qualitative data obtained were analysed using reflexive thematic analysis. The analysis process involved participant confirmation of transcription and coding to ensure that the participants' opinions and meanings were accurately represented. A reflexive thematic analysis was conducted by two coders with an 8% coding similarity.

FINDINGS

The reflexive analysis led to the identification of three key focus areas for knowledge and skills transfer, which were enablers, barriers and possible solutions. The enablers led to themes such as safe, conducive working environments, identified personal attributes and preferred practical learning methods. The study highlighted themes. For example, lack of communication, supervision challenges, personal and interpersonal factors, workplace pressures and adaptation challenges as barriers. Participants emphasised professional development, engagement and student placement strategies as possible solutions to overcome barriers obstructing knowledge and skills transfer. The themes and their respective codes underscored the complex interplay between training characteristics, training design, learning spaces and work environment factors in facilitating or impeding effective knowledge and skills transfer in the clinical environment.

RECOMMENDATIONS AND CONCLUSION

In terms of findings it is important to consider options enhance the knowledge and skills transfer process. It is recommended that training on mentoring should be offered; seminars should be used to improve personal skills, active engagement between radiographers and students as well as initiatives to bridge the gap between students and radiographers; structured student-radiographer clinical environment introduction sessions should be implemented; there is a need to increase the number of clinical training sites and to also address the limited number of student placements in hospitals. The study provided diagnostic radiographers and students with a platform to voice their experiences, offering valuable insights into the enablers, barriers and possible solutions to overcome barriers to knowledge and skills transfer, which can improve clinical training.

A CASE STUDY OF BLUNT FORCE TRAUMA AND HOW PMCT REVEALS INTERNAL INJURIES

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BACKGROUND

Accurately determining the cause of death is a fundamental legal and medical requirement worldwide. In cases where the cause cannot be established by clinical examination, a post-mortem investigation is essential. Major trauma remains a leading cause of death, particularly among younger populations, with blunt force trauma contributing significantly to fatal outcomes. Traditionally, invasive autopsy has been the gold standard for investigating traumatic deaths. However, advances in imaging technology, specifically post-mortem computed tomography (PMCT), offer a valuable, non-invasive alternative or adjunct. PMCT enables detailed visualization of internal injuries, including skeletal and soft tissue damage, often revealing critical findings that may not be apparent externally. This imaging technique is especially useful in cases where external trauma signs are limited or absent, improving the accuracy and efficiency of post-mortem examinations. With increasing pressures on pathology services, PMCT is gaining importance as a complementary tool in post-mortem and forensic investigations.

AIMS AND OBJECTIVES

This case study aims to evaluate the utility of PMCT in uncovering and assessing internal injuries from blunt force trauma when overt external signs are absent. The objective is to assess how PMCT findings can inform conclusions regarding both the cause and mechanism of death.

METHODS

A retrospective search was conducted within the LTH PMCT database to identify cases involving traumatic deaths where both external examinations and PMCT scans were performed. Cases involving paediatric patients or those with significant visible injuries were excluded to focus on instances where external signs were minimal or absent. For each included case, comprehensive data were collected, including clinical and case information, external examination reports and images, PMCT scans with multiplanar and three-dimensional reconstructions, and corresponding PMCT reports. The primary analysis was performed by a consultant radiologist with specialised training in PMCT interpretation. Additionally, a secondary review was carried out by a team comprising 2 specialist PMCT radiographers and a PMCT consultant radiologist to ensure thorough evaluation of the imaging findings.

RESULTS

The case involved an 18-year-old male who suffered fatal injuries in a single-vehicle road traffic collision. Significant trauma was noted at the scene, but specific injuries and medical interventions were not described or recorded. Despite this, the external examination revealed only minimal visible injuries, including abrasions, bruising, and evidence of medical interventions such as defibrillator pads and intraosseous access. In contrast, PMCT uncovered extensive internal damage, including a subarachnoid haemorrhage and a fracture of the C2 vertebra with complete spinal cord transection. Additionally, there was a haemopneumothorax, with the heart displaced posteriorly and complete distortion of the morphology of the great vessels. This finding is suggestive of a complete transection of the great vessels, which would explain the extensive haemothorax observed. These injuries were incompatible with life and were not fully apparent from the external examination and scene information alone. While some limitations existed, such as the absence of invasive autopsy and angiographic studies and limited clinical history, PMCT demonstrated significant value in revealing critical internal injuries that might otherwise have been missed.

CONCLUSION

This case supports the use of PMCT as a valuable tool in detecting internal blunt force trauma injuries when external signs are absent or minimal. PMCT can effectively inform conclusions about both cause and mechanism of death in trauma cases. Further studies with larger sample sizes are recommended to assess PMCT's sensitivity and specificity and to evaluate its potential to replace invasive autopsies in non-suspicious trauma deaths.