Continuing Professional Development

Maximise your CPD by reading the following two selected articles which appear in this issue and answer the five questions. Please remember to self-claim your CPD and retain your supporting evidence. Answers will be available via the QR code and online at https://www.asmirt.org/news-and-publications/jmrs, as well as published in the subsequent JMRS issue.

Medical Imaging – Original Article

Reject rate analysis in digital radiography: an Australian emergency imaging department case study

Atkinson S, Neep M, Starkey, D. (2020) *J Med Radiat Sci.* https://doi.org/10.1002/jmrs.343

1. Which of the following statements is false?
   a. Radiographic images are rejected based on stringent technical and diagnostic factors; as a result, there is minimal variation in individual radiographer reject rates.
   b. The purpose of a reject analysis is to identify areas within the department that require optimisation.
   c. Reject analysis is one example of an efficient and accurate way to gain feedback regarding image quality to help maintain uniform standards.
   d. Reject analysis helps to promote the safe use of radiation by monitoring the ionising radiation delivered to patients and the quality of images produced.
2. What is the most common reason for image rejection in digital radiography?
   a. Patient movement
   b. Anatomy cut-off
   c. Over-exposure
   d. Positioning error
3. In this article, what was the average reject rate?
   a. 5%
   b. 4%
   c. 11%
   d. 9%
4. In this article, what projection had the highest reject rate?
   a. AP Chest
   b. Horizontal Beam Lateral (HBL) Hip
   c. Lateral Elbow
   d. Horizontal Beam Lateral (HBL) Knee
5. Which of the following statements is true?
   a. Expressing the average reject rate of a department as a single percentage is a simple and accurate way to represent a department's performance.
   b. The improved image quality and post-processing capabilities of DR technology have significantly reduced reject rates and made reject analysis redundant.
   c. A single percentage is an inaccurate way to represent department performance and deeper assessment of individual projections and radiographer reject rates is both necessary and an effective means to reduce reject rates and patient dose.
   d. The reject rates for each examination type were comparable to the overall average reject rate for the department.

Recommended further reading:

1. Foos DH, Sehnert WJ, Reiner B, Siegel EL, Segal A, Waldman DL. Digital radiography reject analysis: Data collection methodology, results, and recommendations from an in-depth investigation at two hospitals. *J Digit Imaging* [Internet]. 2009 Apr [cited 2019 Oct 31]; 22 (1): 89–98. Available from: https://europepmc.org/abstract/med/18446413 https://doi.org/10.1007/s10278-008-9112-5
2. Whaley JS, Pressman BD, Wilson JR, Bravo L, Sehnert WJ, Foos DH. Investigation of the variability in the assessment of digital chest X-ray image quality. *J Digit Imaging* [Internet]. 2013 Apr [cited 2019 Oct 31]; 26(2): 217–26. Available from: https://www.researchgate.net/publication/230592310_Investigation_of_the_Variability_in_the_Assessment_of_Digital_Chest_X-ray_Image_Quality https://doi.org/10.1007/s10278-012-9515-1
3. Zhang M, Chu C. Optimization of the radiological protection of patients undergoing digital radiography. *J Digit Imaging* [Internet]. 2012 Feb [cited 2019 Oct 31]; 25(1): 196–200. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3264715/ https://doi.org/10.1007/s10278-011-9395-9

Radiation Therapy – Original Article

Paediatric image-guided radiation therapy: determining and evaluating appropriate kilovoltage planar exposure factors for the Varian on-board imager

Ryan J, Willis D. (2020) *J Med Radiat Sci.* https://doi.org/10.1002/jmrs.352

1. The stochastic effects of radiation associated with imaging of non-tumour sites for IGRT can lead to:
   a. Acute Organ at Risk sequelae
   b. Secondary malignancies
   c. Unnecessary radiation exposure
   d. Improved image matching accuracy
2. When deciding upon appropriate IGRT in paediatric patients, the most important consideration is:
   a. Minimum dose
   b. Anatomical information
   c. Matching accuracy
   d. Balanced optimisation
3. The image sets used for participant matching in this study had offsets that were:
   a. All the same
   b. Digitally created with relative random displacements
   c. Manually created with systematic equal couch displacements
   d. Taken from published literature
4. The image exposures from this study are:
   a. Conclusive and no further work is required to verify their usefulness
   b. Indicative of the improvements that optimisation and IGRT quality assurance can offer
   c. Applicable to adult patients
   d. Translatable to non-tested anatomical sites
5. Where assessing the image matching abilities of individual participants within this study there was:
   a. A significant accuracy advantage with the Low dose pre-set exposures
   b. A significant accuracy advantage with the Factory pre-set exposures
   c. A significant difference in the matching accuracy between participants
   d. No significant matching accuracy difference between the Low and Factory pre-set exposures

Recommended further reading:

1. Wall V, Marignol L, ElBeltagi N. Image-Guided Radiotherapy in Paediatrics: A Survey of International Patterns of Practice. *J Med Imaging Radiat Sci* [Internet]. 2018 Sep [cited 2019 Oct 31]; 49(3): 265-269. Available from: https://www.jmirs.org/article/S1939-8654(17)30386-7/fulltext https://doi.org/10.1016/j.jmir.2018.04.028
2. Ding GX, Alaei P, Curran B, Flynn R, Gossman M, Mackie TR, et al. Image guidance doses delivered during radiotherapy: Quantification, management, and reduction: Report of the AAPM Therapy Physics Committee Task Group 180. *Med Phys* [Internet]. 2018 May [cited 2019 Oct 31]; 45(5): e84-e99. Available from: https://aapm.onlinelibrary.wiley.com/doi/pdf/10.1002/mp.12824 https://doi.org/10.1002/mp.12824
3. Dzierma Y, Mikulla K, Richter P, Bell K, Melchior P, Nuesken F, et al. Imaging dose and secondary cancer risk in image-guided radiotherapy of pediatric patients. *Radiat Oncol* [Internet]. 2018 Sep [cited 2019 Oct 31]; 13(1):168. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6125956/ https://doi.org/10.1186/s13014-018-1109-8

Answers to questions published in previous issue

Please see JMRS Volume 66, Issue 4, December 2019 for the CPD questions at https://doi.org/10.1002/jmrs.367

Anderson NJ, Jackson JE, Wada M, Schneider M, Poulsen M, Rolfo M, et al. The changing landscape of head and neck cancer radiotherapy patients: is high-risk, prolonged feeding tube use indicative of on-treatment weight loss? *J Med Radiat Sci*. 2019 Dec; 66(4):250-258. https://doi.org/10.1002/jmrs.349

Questions	Answers
1	b
2	c
3	d
4	c
5	b

Murphy A, Ekpo E, Steffens T, Neep M. General radiographic image interpretation by radiographers in Australia: a systematic review. *J Med Radiat Sci*. 2019 Dec;66(4): 269-283. https://doi.org/10.1002/jmrs.356

Questions	Answers
1	b
2	b
3	d
4	b
5	d

Answers to this issue

Scan this QR code to find the answers, or visit https://www.asmirt.org/news-and-publications/jmrs

Reflective Practice

Reflection is the process of thinking critically about one's practice, recognising strengths and weaknesses, providing a useful guide to on-going learning.[1] This may involve consideration of assumptions and alternative approaches, comparison to the practice of colleagues, considering the potential relevance and application to practice of new knowledge, acquired through reading, formal learning or other CPD activity. Reflective practice is a key professional capability for all medical radiation practitioners.[2]

Reflective practice may include self-reflection during and after a clinical challenge or experience.[3] Undertaking reflection enables medical radiation practitioners to gain insights about their practice, which provides greater self-awareness and assurance in the delivery of safe health services. A reflection should include learning outcomes, the main key points and application into professional practice.[4] It is a requirement to include reflection in the documentation submitted for CPD audit.[5]

Journal articles are a great tool for gaining new knowledge. When reflecting on professional reading consider and document:

- What was the reading (reference the journal article)?
- What have I learnt from this reading?
- How will this learning be applied to my current practice?
- What further learning could I undertake?

References

1. Koshy K, Limb C, Gundogan B, Whitehurst K, Jafree D. Reflective practice in health care and how to reflect effectively. *Int J Surg Oncol* 2017; **2**: e20.
2. Medical Radiation Practice Board of Australia. Professional capabilities for medical radiation practice (2020) [Internet]. 2019[cited 2020 Feb 13]. Available from: https://www.medicalradiationpracticeboard.gov.au/Registration/Professional-Capabilities.aspx
3. Medical Radiation Practice Board of Australia. Professional capabilities for medical radiation practice [Internet]. 2013[cited 2020 Feb 13]. Available from: https://www.medicalradiationpracticeboard.gov.au/Registration/Professional-Capabilities.aspx
4. Ku M. Guide to AIR Continuing Professional Development Program. Australian Society of Medical Imaging and Radiation Therapy, Melbourne, 2013.
5. Medical Radiation Practice Board of Australia. Guidelines: Continuing Professional Development [Internet]. 2015[cited 2020 Feb 13]. Available from: https://www.medicalradiationpracticeboard.gov.au/Registration/CPD.aspx