

Commentary

The emergence of nephrogenic systemic fibrosis (NSF) forced the radiologists to look at the issue of contrast safety in MR imaging. Prior to this the gadolinium based agents were considered so safe that they were used as a contrast agents in catheter angiography in high risk patients. For the record gadolinium based contrast agents are at least as nephrotoxic as iodinated agents. Their myth of relative safety in patients with renal failure was based on the fact that a very small dose is required in routine examinations. After an initial period of denial it is now accepted that NSF exists and is probably due to the chelation of Gadolinium breaking down due to impaired clearance. Thing to remember here is that prevention is the key as there is no treatment. Haemodialysis does not remove the gadolinium and therefore gives no protection. DaftariBeshelia et al review the current status of this condition and most importantly give both the FDA and ESUR guidelines for the use of gadolinium based agents.

Carrying on from the last issue where we discussed the importance of training residents to report, Rosenkrantz, et al look at another aspect of reporting. The report is the vehicle by which we communicate with our clinical colleagues. It is important that both of us understand each others language. Rosenkrantz,'s findings suggest that we don't. Subjective indications of probability are vague and not universally understood. Although he recommends the routine use of numerical measure of probability I felt that his may be very difficult to achieve.

An increasing number of our trainees are aspiring to sit the examination of the Royal College of Radiologists of UK. CPSP should take note that trainees give as much if not more emphasis on acquiring the UK qualification compared to the FCPS. This reflects the general unhappiness with the FCPS as the CPSP feels that the most important step in training is the assessment i.e. the exam. Although Hawtinaet all look at the FRCR exam their findings are probably generalizable. The single most important determinant of success in exams (and life) is the training that we receive. I hope CPSP is paying attention.

With the proliferation of digital imaging the film is becoming increasingly redundant. Both diagnostic reading and archiving is now done electronically. The medical grade monitors are expensive. With the improvement in display technologies driven by the home entertainment market there is a convergence in the standards employed in medical grade and consumer grade display panels. Although the number of test subjects in Salazar et al study are relatively small it highlights a growing understanding that these consumer grade monitors are probably good enough even for diagnostic use.

A lot has been said about the huge increase in the radiation burden to the human genome from diagnostic procedures. CT scans now constitute the largest source of man made radiation to which the populations are exposed. Guttikondaa et al reassure us that this probably has no significant adverse effects in the population that they studied. Even so judicious use of diagnostic procedures is to be advocated, not just to reduce the radiation dose but also the cost to the patient.

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Current status of nephrogenic systemic fibrosis

Nephrogenic systemic fibrosis (NSF) occurs in patients with advanced chronic kidney disease (CKD) or acute renal failure, most commonly following exposure to gadolinium-based contrast agents (GBCAs). NSF can be debilitating and associated with increased mortality. The putative association of NSF with GBCAs prompted the development of guidelines to limit the use of these contrast agents in at-risk patients. Indeed, the incidence

of NSF has decreased dramatically following application of these guidelines, which appears to be the only effective means of decreasing NSF incidence. Thus, increasing clinician awareness of these updated guidelines is important. The present review introduces and compares updated guidelines for GBCA use and discusses the latest advances in the understanding of the pathogenic mechanisms and treatment of NSF.

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How “consistent” is “consistent”? A clinician-based assessment of the reliability of expressions used by radiologists to communicate diagnostic confidence

AIM: To evaluate the degree of variability in clinicians' interpretation of expressions used by radiologists to communicate their level of diagnostic confidence within radiological reports.

MATERIALS AND METHODS: Clinicians were solicited to complete a prospective survey asking them to select the approximate perceived level of certainty, expressed as a percentage, associated with 20 expressions used by radiologists to communicate their level of diagnostic confidence within radiological reports. The median and inter-decile range (IDR) were computed for each expression, with a smaller IDR indicating greater reproducibility. Clinicians were also asked questions regarding their attitudes about radiologists' communication of diagnostic confidence.

RESULTS: Forty-nine surveys were completed. Median confidence associated with the expressions ranged from 10–90%. Reproducibility of the expressions was

variable, as IDR ranged from 15–53%, although a median IDR of 40% indicated overall poor reproducibility. Expressions with relatively higher reproducibility included “most likely”, “likely”, and “unlikely” (IDR 15–20%), whereas expressions with relatively lower reproducibility included “compatible with”, “suspicious for”, “possibly,” and “can be seen in the setting of” (IDR =45%). Only 20% of clinicians agreed or strongly agreed that radiologists consistently use such expressions within their reports. Fifty-five percent of clinicians preferred that diagnostic confidence be communicated as a percentage rather than as a textual expression.

CONCLUSION: There was poor reproducibility in clinician's interpretations of many expressions used by radiologists to communicate their level of diagnostic confidence. Use of percentages to convey diagnostic confidence within reports may mitigate this source of ambiguity in radiologists' communication with clinicians.

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Performance in the FRCR (UK) Part 2B examination: Analysis of factors associated with success

AIM: To assess factors that influence pass rates and examination scores in the Fellowship of the Royal College of Radiologists (FRCR) 2B examination.

MATERIALS AND METHODS: 2238 attempts at the FRCR 2B examination were evaluated between Spring 2006 and Spring 2010. Pass rates and examination scores were analysed by gender and ethnicity, and the influence of factors such as radiology training (UK versus non-UK), sitting (Spring versus Autumn), and the presence of an undergraduate or postgraduate degree were examined.

RESULTS: 1571 candidates made 2238 examination attempts, with an overall pass rate of 59.4% (63.1% at first attempt). 66.2% entrants were male; 48.8% attempts were by candidates from a UK radiology training scheme. UK candidates were significantly more likely to pass than non-UK candidates ($p < 0.0001$). White candidates were more likely to pass at

first or second attempt than non-white candidates ($p < 0.0001$), but when restricted to UK entrants ethnicity did not influence success at first attempt. Overall, females were more successful than males ($p < 0.001$). Presence of an undergraduate ($p = 0.19$) or postgraduate ($p = 0.80$) degree did not affect pass rate at first attempt for UK candidates. However, logistic regression demonstrated that the only significant factor influencing pass rates at first attempt was whether radiology training was undertaken in the UK ($p < 0.0001$). A trend towards increased pass rates in autumn sittings was seen ($p = 0.06$), but ethnicity ($p = 0.99$) and gender ($p = 0.41$) were not significant factors.

CONCLUSION: The FRCR 2B examination is non-discriminatory for UK candidates with respect to gender and ethnicity. Poorer performance of non-UK trained candidates is a consistent outcome in the literature.

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DICOM Gray-Scale Standard Display Function: Clinical Diagnostic Accuracy of Chest Radiography in Medical-Grade Gray-Scale and Consumer-Grade Color Displays

OBJECTIVE: The purpose of this study was to compare the diagnostic accuracy achieved with and without the calibration method established by the DICOM standard in both medical-grade gray-scale displays and consumer-grade color displays.

MATERIALS AND METHODS: This study involved 76 cases, six radiologists, three displays, and two display calibrations for a total of 2736 observations in a multireader-multicase factorial design. The evaluated

conditions were interstitial opacities, pneumothorax, and nodules. CT was adopted as the reference standard. One medical-grade gray-scale display and two consumer-grade color displays were evaluated. Analyses of ROC curves, diagnostic accuracy (measured as AUC), accuracy of condition classification, and false-positive and false-negative rate comparisons were performed. The degree of agreement between readers was also evaluated.

RESULTS: No significant differences in image quality perception by the readers in the presence or absence of calibration were observed. Similar forms of the ROC curves were observed. No significant differences were detected in the observed variables (diagnostic accuracy, accuracy of condition classification, false-positive rates, false-negative rates, and image-quality perception). Strong agreement between readers was also deter-

mined for each display with and without calibration.

CONCLUSION: For the chest conditions and selected observers included in this study, no significant differences were observed between the three evaluated displays with respect to accuracy performance with and without calibration.

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Estimated radiation exposure and cancer risk from CT and PET/CT scans in patients with lymphoma

INTRODUCTION: The purpose of this study was to estimate total effective dose and cancer risk related to treatment monitoring and surveillance computed tomography (CT) scans in a cohort of patients diagnosed with lymphoma.

METHODS: 76 patients with head, neck, chest, abdomen or pelvis CT and whole-body positron emission tomography (PET)/CT were identified from an institutional lymphoma database; this included 54 (71%) patients with non-Hodgkin and 22 (29%) patients with classical Hodgkin lymphoma. Average treatment and surveillance periods were 8 months (range, 3-14 mo) and 23 months (range, 1-40 mo), respectively. Radiation exposure was estimated from the dose-length product (DLP) for CT scans and milli-Curies and DLP for PET/CT scans. Cancer risk was estimated using the Biological Effects of Ionizing Radiation model.

RESULTS: During their treatment period, 45 patients had 161 CT exams and 39 patients had 73 PET/CT exams. Mean effective dose was 39.3 mSv (range, 7.1–100 mSv). During the surveillance period, 60 patients had 378 CT exams and 25 patients had 39 PET/CT exams. Mean effective dose was 53.2 mSv (range, 2.6–154 mSv). Seventeen of 76 (22.4%) patients had total cumulative doses greater than 100 mSv. The mean increase in estimated cancer risk was 0.40%; the greatest estimated risk to any one patient was 1.19%.

CONCLUSION: Mean total effective dose and mean estimated cancer risk were low in patients with lymphoma undergoing serial imaging, suggesting that theoretical risks of radiation-induced cancer need not be a major consideration in radiologic follow-up.