How we manage radiation protection in our country
Royal College of Radiologists

RCR national audit of appropriate imaging

Denis Remedios, Karl Drinkwater and Rowena Warwick on behalf of the RCR Clinical Radiology Audit Committee (CRAC); Contact: karl_drinkwater@rcr.ac.uk

Background

Appropriate imaging and justification are driven by good evidence-based medical practice and the application of radiation safety, which may influence commissioning and costs through the avoidance of unhelpful, unnecessary investigations. This audit assesses structure, process and outcome for appropriateness of imaging, using a sample of CT and MRI examinations requested from primary care. Use of imaging referral guidelines has been shown to improve appropriateness of imaging, reducing numbers of exams typically by 20% [1,2] and thus making the best use of clinical radiology.

Referral criteria with dose information are required under the Euratom Medical Directive 97/43 [3] and the UK Ionising Radiology (Medical Exposures) Regulations 2000 (IRMER) [4]. The RCR has published referral guidelines [5] for over 20 years, principally to guide general practitioners.
The need for clinical audit to monitor justification has been set out in the Euratom Directive, [3] and IRMER [4], reiterated in Europe [6,7] and globally through the IAEA in its campaign for Awareness, Appropriateness and Audit [8]. The need for monitoring has been reiterated in the International Basic Safety Standards [9].

Methods

The three standards adopted for this audit are based partly on legislation [4] and partly on expert consensus by the RCR CRAC. Although the aspirational standard of 100% is applicable to the element governed by legislation, viz. the availability of guidelines, a realistic target of 95% was used for evidence of vetting to allow for emergency cases where vetting would result in delay. The lower figure of 90% for guideline compliance allows for the expected deviation from generic justification when applying individual justification at ICRP level 3 [10].

1. Imaging Referral Guidelines available to 100% of justifying practitioners.
2. 95% of GP requests for CT or MRI vetted individually or through an agreed protocol.
3. 90% of GP requested CT and MRI examinations are compliant with guidelines or local protocols.

A web-based questionnaire requesting anonymised data was devised by the RCR CRAC and distributed to all UK departments of radiology.

Results

Replies were received from 88 departments covering 1,700 of 2,700 (63%) consultant radiologists practising in the UK. Approximately a third of respondents were not aware of having guidelines available. The 68% level of availability is well below the standard of 100%.

Vetting/justification of CT and MRI requests took place in approximately 96% and 95% of cases respectively (in keeping with the target of 95%).

Appropriateness of CT and MRI examinations was were shown appropiate in 93% and 95% respectively (above the target of 90%). In the funnel plot, most departments are within the control limits indicating common cause for variation with few low outliers (see Figs. 1, 2). Analysis of the 7-8% inappropriate investigations showed that CT was often not the best investigation. The most common reason for an inappropriate investigation for both MRI and CT was the inability to affect patient management (see Fig. 3).

Figure 1: The proportion of GP-requested CT investigations that was retrospectively appropriate. The mean departmental value was 92% (with a standard of 90%).

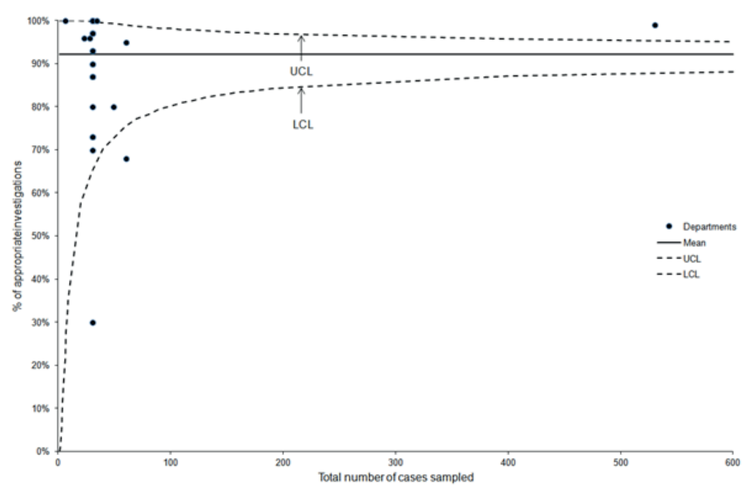


Figure 2: The proportion of GP-requested MRI investigations that was retrospectively appropriate. The mean departmental value was 94% (with a standard of 90%).

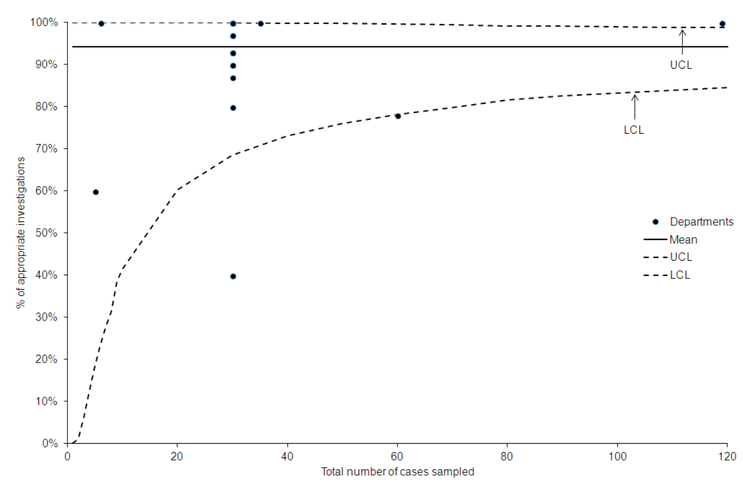


Figure 3: Inappropriate CT and MRI investigations. These represent a very small proportion of the total number of CT (2,026) and MRI (1,333) investigations performed.

Additional information to clarify difficulties and identify solutions included:

» Estimates of the numbers of CT and MRI examinations performed or not performed by departments at GPs' request (Fig. 4). The percentage of CT requests not performed (12%) was a third higher than for MRI (9%).

Availability of tools to help with vetting and justification.

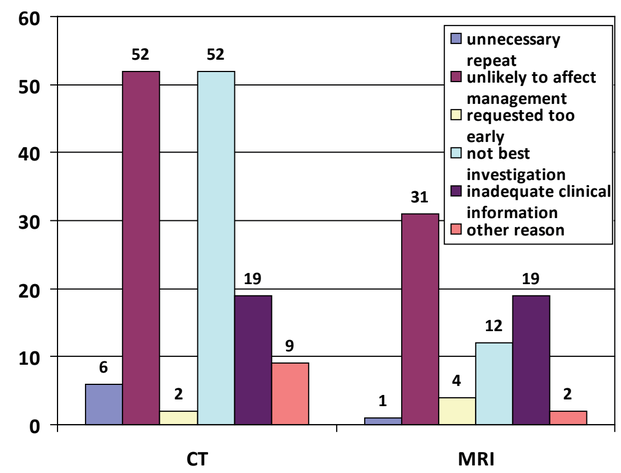
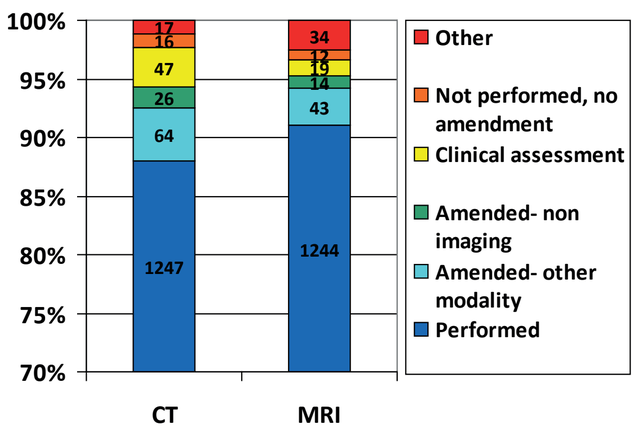


Figure 4: GP initiated CT and MRI requests: estimates of numbers performed / not performed weekly. The proportion of requests amended or not performed for CT (12%) was a third higher than for MRI (9%).



Discussion

Although awareness of guideline availability (in only 68%) may not be the same as availability of guidelines, this is partly due to on-line access in only 66% of departments. Half of all departments still use paper copy. Since this audit was performed, on-line access has been addressed following the introduction of NHS network access of RCR guidelines to all NHS workers in England similar to the other 3 three home nations.

Average figures for vetting (96%) and appropriate imaging (94%) in UK departments compare well with the published figures of 80% for justification of CT in a Swedish study [10]. This was achieved through modality change in 12% of CT requests and 9% of MRI requests. The one-third higher rate of change for CT compared with MRI requests probably reflects the awareness and need for radiation safety. Clinical/imaging pathways would be usefully augmented by computerised clinical decision support, most easily through existing electronic request systems.

Conclusions

Although awareness of availability of imaging referral guidelines locally is limited at 68%, well below the 100% standard, the meticulous vetting and justification of requests (achieving the 95% standard) with the amendment or return of 9-12% inappropriate requests enables facilitates a highly appropriate (93% and 95% respectively, standard 90%) imaging service for CT and MRI requested by GPs, thus making the best use of clinical radiology.

Poster References:

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