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### Imaging Referral Guidelines– Update

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#### Key Points

- Need for awareness that appropriate imaging goes beyond justification: the best test first.
- Global access to guidelines is aided by smartphone and tablet apps.
- Guideline implementation is challenging, but clinical decision support systems are promising.
- UK National Audit shows 90% appropriateness achievable for GP-requested CT.

#### Table 1.

Action 1 from the Bonn Call-for-Action. The first of 10 main actions, and related sub-actions, which were identified as being essential for the strengthening of radiation protection in medicine over the next decade (International Atomic Energy Agency and World Health Organization 2013)

#### **Enhance the Implementation of the Principle of Justification**

- Introduce and apply the 3As (awareness, appropriateness and audit), which are seen as tools that are likely to facilitate and enhance justification in practice;
- Develop harmonised evidence-based criteria to strengthen the appropriateness of clinical imaging, including diagnostic nuclear medicine and non-ionising radiation procedures, and involve all stakeholders in this development;
- Implement clinical imaging referral guidelines globally, keeping local and regional variations in mind, and ensure regular updating, sustainability and availability of these guidelines;
- Strengthen the application of clinical audit in relation to justification, ensuring that justification becomes an effective, transparent and accountable part of normal radiological practice;
- Introduce information technology solutions, such as decision support tools in clinical imaging, and ensure that these are available and freely accessible at the point-of-care;
- Further develop criteria for justification of health screening programmes for asymptomatic populations (e.g. mammography screening) and for medical imaging of asymptomatic individuals who are not participating in approved health screening programmes (e.g. use of CT for individual health surveillance).

The Royal College of Radiologists (RCR) has published imaging referral guidelines for over 20 years. The current, 7th edition, iRefer: Making the Best Use of Clinical Radiology (Royal College of Radiologists 2012) was published in early 2012, and with over three hundred clinical scenarios gives evidencebased recommendations for the best test first, taking into consideration diagnostic/ therapeutic efficacy, radiation safety and cost-effectiveness.

RCR guidelines have been translated into four languages and are destined for use in Austria, Croatia, Japan, Norway, Poland and the Middle East. The value is not just to the referrer, but also to the justifying practitioner (radiologist or radiographer) as well as to the healthcare organisation, department of health and, of course, the patient. In recent years many countries have accepted imaging referrals from non-medical healthcare practitioners such as chiropractors, physiotherapists and nurse practitioners. For low dose procedures e.g. plain radiographs the process of justification and assessment of benefit against radiation risk has been delegated increasingly to radiographers whose decisions are informed by referral guidelines. Responsibility for justification still rests firmly with the radiologist in consultation with the referring clinicians. The new international basic safety standards (International Atomic Energy Agency 2011) have promoted the shared concept for justification between radiologists, referrer and the patient. This is in line with the patient advocates' mantra *Nihil de nobis, sine nobis* (nothing about us without us) (Wagstaff 2004).

### **International Initiatives**

International agencies have joined forces in advocating the availability, use and compliance with imaging referral guidelines. In December 2012, at the "International Conference on Radiation Protection in Medicine: Setting the Scene for the Next Decade" in Bonn, there was a clear call for imaging referral guidelines to be available globally with measures to aid implementation and monitoring (see Table 1) (International Atomic Energy Agency and World Health Organization 2013).

Over the last decade the momentum has gathered for appropriateness. Appropriateness goes beyond justification of a particular radiation procedure, and promotes the use of the best test first. For such advice to be acceptable allowance must be made for differences in provision of equipment, available expertise and acceptability by patients. These differences exist between countries and even within a country where differences in resources are prevalent.

The International Atomic Energy Agency (IAEA) has hosted a number of meetings to promote good practices, explore methods of monitoring and to ensure the correct stakeholders are involved. Following these there have been advances in agreeing a common methodology and essential stakeholder groups for referral guideline development. The need for patient group involvement is clear. The European Society of Radiology (ESR) supports this, and has established a Patient Advisory Group for Medical Imaging (PAGMI) (European Society of Radiology 2013). The World Health Organization (WHO) has for the last five years worked on the Global Initiative for Radiation Safety in Healthcare Settings (World Health Organization 2013), and has worked side-by-side with the IAEA in the promotion of good practices with regard to radiation safety in healthcare. At the recent meeting in Geneva in September 2013 there was a clear impetus for global guideline development, review and monitoring. Initially this could be done through adopting and adapting existing guidelines, as has been promoted by the ESR, but there is a clear wish globally to develop guidelines for the world, building on the principle that the best practice should still be promoted even in under-resourced countries, who may one day also have provision of imaging facilities to enable this. The same wishes have been made in Europe through the recent European Commission-sponsored project on availability of imaging referral guidelines in Europe where there is a clear recommendation for guidelines to be made available throughout the community and for monitoring mechanisms to be in place (see Table 1). The Global Summit for Radiological Quality and Safety (GSRQS), held in Washington DC in May 2013, combined the forces of the ESR, American College of Radiology (ACR) and International Society of Radiology (ISR) in the promotion of good practices, of which referral guidelines and monitoring through audit were high on the agenda. A second global summit is planned for Barcelona in 2015. Appropriate referral guidelines will also be a major focus for the Radiation Protection Medicine (RPM) meeting in Varna in 2014, supported by the European Commission and IAEA amongst others. Clearly, combining efforts and sharing the work of guidelines development will pay dividends.

### **Access & Distribution**

There is still a problem of distribution of imaging referral guidelines to the intended users, primarily to general practitioners and doctors in training. This is evident from the recent RCR audit of appropriate imaging (Royal College of Radiologists in press), where distribution of guidelines to justifying practitioners is still limited to less than 70% and may be limited to as few as 50% of referrers in a country which has had guidelines for over 23 years. This audit highlighted the need even in the 21st century for a print copy as well as online access. 50% of justifying practitioners still use print copy to a greater or lesser extent. There is no doubt that online access is easier to use and to update, and an interactive format (as used by the French Society of Radiology (Société Française de Radiologie 2012)) does have value. Access to ehealth through smartphones and tablets has appeal to the peripatetic user e.g. in the community or on ward rounds. The RCR iRefer apps are in use in five continents including 14 countries in Europe, the Americas, Africa, Australia and Asia. The Société Française de Radiologie (SFR) is currently developing similar technology. Adopting, adapting and translating guidelines such as the SFR and RCR guidelines has been encouraged in Europe by the ESR.

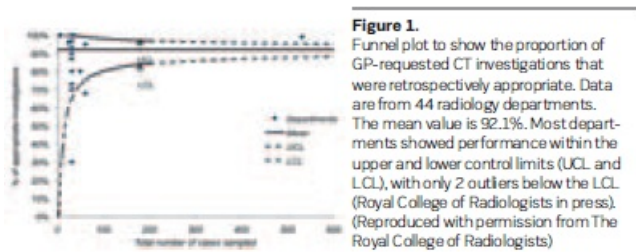
### **Implementation**

The challenge of implementation continues to be difficult with many new initiatives proposed and now being introduced. The American College, in conjunction with the National Decision Support Company (Andover, MA), has launched ACR Select (ACR Select n.d.), which has a clinical decision support system (CDS) aimed at promoting appropriate imaging at the time of referral based on ACR Appropriateness Criteria. For CDS systems to work they should be computer-based, take place within workflow and have an actionable endpoint, which is usually the formulation of the imaging request (Kawamoto et al. 2005). A European project along the same lines is taking place in Barcelona, and is at an early stage. The value of such systems to encourage appropriate imaging and for education is likely to be greater than the cost-saving, particularly in those environments where the best tests have been under-utilised. There will of course be clear savings where there is proven over-utilisation. In the United States CT over-utilisation, with typical estimates of 40% (Hadley et al. 2006), suggests that there will be a benefit in both radiation exposure and cost. It should be stressed that CDS should only support justification, and in Europe responsibility finally rests with the radiological medical practitioner.

### **Monitoring**

Several models for monitoring guidelines usage and appropriateness of imaging have been used in Europe and abroad. Regulation is robust and

effective but an expensive process, in those nations of the world in which such regulations exist. Soft regulation is of limited value. Licensing takes into account regulatory standards but only retrospectively. Clinical audit is a mandatory process under the European Council Directive 97/43 (European Commission 1997). This has been interpreted differently in various member states with a spectrum ranging from external audits (often used in Germany) to local internal audit, practised in the UK. Whereas a more objective and inclusive approach is afforded by external audit this is an expensive process, the funding for which is not always clear. Local internal audit is inexpensive, and can target perceived local issues sometimes with dramatic results (RCR National Audit of Appropriate Imaging). A further variation is the National Audit, which is often run by professional societies to promote good practices and which receives anonymised data from all or many facilities across the country.



The RCR performed an 'Audit of Appropriate Imaging' in early 2013. This received returns from 88 departments including 1700 of 2700 consultant radiologists in the UK. Benchmarking and statistical process control was used to identify departments with special cause for variation as identified through funnel plots (see Figure 1). The standards chosen took into account availability, use of guidelines and compliance with guidelines in order to achieve appropriate imaging. The standard of 100% availability of guidelines was driven by Ionising Radiation (Medical Exposure) Regulations 2000 (HMSO 2013), the UK transposition of Council Directive 97/43 (European Commission 1997). Difficulty in achieving this standard has since been helped by national distribution of guidelines by the UK Department of Health through the N3 wide area health network. The high target of 95% and 90% for evidence of vetting/justification of requests and for retrospectively-assessed appropriateness were achieved, and will add to examples of good practice in Europe.

#### The Future: Recommendations

In the recent European Commission-sponsored project regarding referral guidelines in Europe (European Society of Radiology 2012), the views and wishes of 30 countries were taken into consideration. Feedback from 28 member states, Switzerland and Norway was clear in the wish for European guidelines, which may initially be adopted and adapted; mechanisms for implementing clinical guidelines, including clinical decision support systems; educational initiatives such as Medical Radiation Protection Education and Training (MEDRAPET 2011-) and clear direction for monitoring, particularly by clinical audit. It would seem that these wishes are common to the other regions of the world through the Bonn call-for-action.

Imaging referral guidelines are of undoubted value, with growing distribution through smartphones and tablets, but for their full implementation with clinical decision support, are they affordable?

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