

Stephen Golding

The radiologist's conundrum: benefits and costs of increasing CT capacity and utilization—a commentary

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This paper is a timely reminder that, whatever the differences in health-care systems, the problems faced by Radiology across the world are often very similar. The rise in the clinical use of computed tomography (CT) is incontrovertible: the flexibility of modern CT systems offers little resistance to the demand for intensive examinations and high productivity, and there has been an extraordinary expansion in the number of clinical applications to which the technique can now be applied. Many of these have been major advances in investigative medicine, fully justified by the contribution they make to patient care. In other areas, however, there is doubt, and, as the authors point out, the expansion of the technique may at times be driven not by justifiable clinical need, but by pressure to perform financially or by demand from referrers. Today no institution can afford to ignore the tension between resource and demand that results from the technical capacity and application of CT, and there is general perception that a need exists for some constraint in utilisation.

In Europe asking for examination by CT is regarded as a request for a clinical opinion by the radiologist, rather than a test that is “ordered” by a clinician. In Europe the use of CT, in common with other radiation-based tests, is governed by radiation protection law, which requires that the examination should be justified by a clinical indication and that the technique should be optimised to deliver a result in the lowest radiation exposure appropriate—ALARA (as low as reasonably achievable). It might be expected, therefore, that in Europe “the CT problem” should not exist. However, there is significant concern—and also evidence—that clinical use of CT is not as tightly constrained as it might be and that the rising use of the

technique has been accompanied by increased variation in examination technique and therefore exposure. Despite the introduction of Ionizing Radiation Regulations, it appears that we have not always achieved the spirit of the European Union Directive that led to them. Successive surveys have shown that variability in practice appears to be increasing rather than coming under control.

This may partly be due to the pressure of increasing demand on radiology generally. Faced with rising workload, radiologists may come to rely on “catch all” examination protocols rather than carefully targeting the investigation to the current clinical need. This may explain why the “chest, abdomen and pelvis” request seems to have become so common.

Undoubtedly another reason for variable practice is that the evidence base is not as strong as it might be. Although the clinical applications of CT were well documented in the past, a striking feature of the recent literature is that studies of clinical application have largely been limited to new applications facilitated by technical advances, and the practice of established indications has not been updated. Most importantly, we lack firm criteria on what constitutes a threshold exposure in individual clinical applications, an approach that would lead to dose reference levels and end the clinical use versus protection debate to which the authors refer.

This has led to reliance on clinical guidelines such as those on clinical indications that have been published in the UK by the Royal College of Radiologists and those from a European working group giving general recommendations on exposure and dose. More studies are needed to give this work a robust evidence base, and there is also a need to educate clinical referrers; in this respect the scoring system reported by the authors represents an interesting contribution to the debate.

If we are responsible in our practice, CT will only be performed on the basis of sound clinical justification, using the minimal acceptable exposure, when the potential benefit is judged to outweigh the risk, and supported by a clinical evidence base that is continually updated by sound studies of clinical practice and exposure constraint. It seems inescapable logic that in this clinical setting the radiologist has the appropriate professional training to be the gate keeper and guardian of the patients’ interests in the face of financial and clinical pressures to act otherwise.

S. Golding
University of Oxford, Oxford, UK

S. Golding (✉)
Oxford MRI Centre, John Radcliffe Hospital,
Oxford, OX3 9DU, UK
e-mail: stephen.golding@nds.ox.ac.uk
Tel.: +44-1865-221904
Fax: +44-1865-222019