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Radiology: Opportunities and Challenges

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Abstract

Since Wilhelm Conrad Röntgen's discovery of X-Rays in 1895, radiology has made significant advances with the use of digital X-Rays, Ultrasound, Computer Tomography (CT), Magnetic Resonance Imaging (MRI) and Positron Emission Tomography (PET). The development of interventional radiology as a specialty in its own right illustrates this too. In this review, we will discuss the exciting opportunities and new challenges that radiology faces in the modern era.

Introduction

Radiology has made great technological advances in recent years and the development of interventional radiology as a specialty in its own right illustrates just how fast the specialty is evolving.

A radiologist's role extends much further than simply reporting scans and they now play a central role in the management of patients. Radiologists are spending more time preparing and participating in multidisciplinary team meetings (MDT) as they play an increasingly important role within the clinical team.

The opportunities in radiology

The fast changing nature of radiology means that radiologists continually have to learn new skills. Radiologists need to be decisive and must exercise sound judgement in order to guide clinicians appropriately. With the recent exciting developments in interventional radiology, procedural skills, hand-eye co-ordination and an ability to interpret images in three dimensions (3D) have become essential.

Patients are now benefiting from the variety of minimally invasive procedures that can be performed. This is illustrated by exciting developments such as the use of minimally invasive chemo-embolisation (1) and ultrasound beam sensitive microbubbles to deliver chemotherapy (2). These new therapies are revolutionising the management of patients with cancer.

Conventional diagnostic radiology has also progressed in leaps and bounds with

the increasing use of functional Magnetic Resonance Imaging (fMRI) for perfusion imaging (3) and the development of virtual colonoscopy for the identification of bowel malignancy (4). The increasing use of Positron Emission Tomography (PET) is also an area that is rapidly developing in the diagnosis and treatment of oncology patients (2).

Another exciting opportunity is the advent of tele-radiology. This allows radiologists to access images from home, leading to more flexible working patterns (5). It also encourages the use of 24 hour reporting whereby radiologists can provide expert opinion out of hours. Clinicians would have access to reports overnight which would improve patient care. Tele-radiology has been successfully implemented in the USA, Australia and New Zealand, especially in smaller centres where radiologists are not normally present.

The future challenges of radiology

Although Radiology is a fast growing specialty, it runs the risk of becoming a victim of its own success. An increasing amount of radiology-related work is being done by other specialties. For example, vascular surgeons already perform endo-vascular stents⁵ and gynaecologists perform ultrasound examinations. The use of Focussed Assessment with Sonography in Trauma (FAST) has led to many emergency practitioners being trained in the use of ultrasound too (6). Although some see this as a "threat" to the specialty, it may also present opportunities for close collaboration between radiologists and clinicians. In some centres, for example, radiologists and cardiologists work together to report cardiac images (7) and collaboration may form the backbone of radiology services in the future. This demonstrates the changing role of clinical radiologists within the modern NHS.

The increasing use of tele-radiology also highlights a number of issues. Although tele-radiology offers many benefits, this comes at the potential cost of distancing the radiologist from the patient and the referrer, potentially impacting on clinical care (8). There are also real concerns that it may threaten consultant jobs in the UK by outsourcing radiology services abroad. This also raises questions about the legality and accountability of tele-radiology services (9). Although NHS trusts have over-all responsibility for patient care, it is not clear who would be liable if mistakes are made by radiologists working abroad. The Royal College of Radiologists have issued guidelines on the use of tele-

radiology (10), however concerns still exist about its use in the UK.

Another significant challenge facing radiology is the pressure of targets. National Institute of Clinical Excellence (NICE) guidelines, for example, stipulate that patients presenting with stroke should have imaging performed urgently (11). This can pose difficulties for radiologists out of hours. As thrombolysis for stroke is more widely used, the need for faster CT scanning is likely to increase. This may lead to a 24 hour radiology service being implemented in which radiologists work shifts rather than on-calls. Although, this change in working practice would certainly improve patient care, radiologists would have to work more unsocial hours and this would impact on their work-life balance.

In the modern NHS, the role of radiologists is continually changing. In the face of advancing technology, this presents new opportunities and unique challenges. This is what makes radiology such an exciting and dynamic specialty to work in.

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Note: Since submission of this article, Dr A Parekh has obtained a Specialist Training post in Radiology under the auspices of the Severn Deanery Schools.