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Credentialing in radiology: Current practice and future challenges

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Abstract

Radiology has changed significantly in recent years. The volume of work has increased dramatically as has its complexity. Future radiologists need an adequate training and expertise in conventional practice as well as new techniques. This comes at a time when other stakeholders outside of radiology are voicing their own concerns. The rightly justified increasing focus on patient safety has placed even more emphasis on the demonstration of competent practice by all health care professionals. Credentialing has been put forward as a way to ensure a doctor is competent in specific areas. Credentialing may be an alien concept to many radiology trainees but moves are afoot in the United Kingdom to bring it to the forefront of its postgraduate medical training. Credentialing began in 20th century North America where it was linked to the process of privileging. It subsequently garnered a strong patient safety focus and has become a part of the international healthcare agenda. Not everyone agrees with credentialing, it has many criticisms including the risk of speciality "turf wars" and the stifling of medical excellence to name just a couple. Is credentialing in radiology here to stay or will it pass by quietly? This paper reviews the global credentialing movement and discusses how this may impact on future radiology training, using the United Kingdom as its case example.

Key words: Credentialing; Medical education; Patient safety; Radiology; Accreditation

Core tip: The increasing complexity of modern radiology provides a challenge for training. Future radiologists need an adequate training and expertise in conventional practice and new techniques. Credentialing describes a process that has been used as one of the ways to ensure a doctor's competence in specific areas. With the rapid change within radiology, should credentialing become a larger part of the process? This paper discusses the global credentialing movement and how this may impact on future radiology training, using the United Kingdom as its case example.

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INTRODUCTION

Radiology has changed dramatically in the last 25 years. Indeed, it may be argued that this change has been more significant than in any other medical specialty, given radiology's inherent link to technological advancements. Not only has the overall general workload increased exponentially but more of this is complex imaging and complex interventional procedures.

This increase in complexity of modern radiology provides a challenge for training. Future radiologists need adequate training and expertise in conventional practice and new techniques. This also comes at a time when other healthcare stakeholders outside of radiology are voicing their own concerns. For example, the rightly justified increasing focus on patient safety has placed even more emphasis on the demonstration of competent practice by all health care professionals.

Credentialing describes a process that has been used as one of the ways to ensure a doctor's competence in specific areas. These are often referred to as individual "competencies", quite separate from an overall global judgment of competency in a particular specialty. This concept is useful: For example, an otherwise competent radiologist may have no specific training and experience in a specialist technique such as endocavity ultrasound.

Moves are afoot to bring credentialing to the forefront of the United Kingdom's postgraduate medical training. With the rapid change within radiology, should credentialing become a larger part of the process? This paper discusses the global credentialing movement and how this may impact on future radiology training, using the United Kingdom as its case example.

BACKGROUND

A recent definition of credentialing is: "A process which provides formal accreditation of attainment of competencies (which include knowledge, skills and performance) in a defined area of practice, at a level that provides confidence that the individual is fit to practice in that area in the context of effective clinical governance and supervision as appropriate to the credentialed level of practice"[1].

Credentialing has traditionally been an important part of the United States health care system. It has subsequently been slowly adopted by other parts of the world. Prior to the 1970s, presumption of competence in procedures was assumed by a doctor's specialty board certification[2].

In the United States, credentialing usually describes an institutional review process that guarantees the range of professional practice of an employed doctor[3]. They do this by establishing standards and ensuring doctors under their employment meet such standards. Each health care organization sets its own standards required for the particular needs of the institution[2].

Hospital credentialing is therefore perhaps the dominant way of confirming competence of doctors in the United States[4]. With the right credentials, a doctor can be accredited for practice in a specific area of work, a process known as privileging[2]. Privileges are not typically transferable between hospitals[5]. Essentially, the final responsibility for a doctor to meet an adequate level of competency is down to the hospital governing board and its medical staff[5].

It could be argued that this model has largely risen in an attempt to contain the spiralling costs of medical malpractice in the United States. However, there are potential benefits of credentialing aside from medico-legal issues.

CREDENTIALING FOR SAFETY

Credentialing has been seen as a way to create regulated standards of clinical practice in order to maintain and augment patient protection[6]. This is particularly true where a new technique is introduced that: (1) has no established training pathway; (2) is complex; and (3) is of high-risk to the patient if not performed competently.

In the United Kingdom, credentialing has been highlighted as a way of safeguarding patients, for example against the unprecedented rise in unregulated cosmetic procedures. By having a clear and widely recognised national standard, patients are protected from harm inflicted by untrained and unscrupulous individuals.

An early 21st century example of credentialing in radiology is within American endovascular surgical neuroradiology (ESN) training. As far back as 2004, a joint statement from multiple neuroscience bodies was produced to discuss credentialing standards for carotid stenting and cerebrovascular intervention[4]. In this case credentialing was cited as a way to ensure adequate neuroscience training and experience in order to ensure patient safety and adequate procedural results.

In the United States in 2009, the Society of Interventional Radiology aimed to create consensus guidelines for training in endovascular ischaemic stroke intervention[7]. Drawing on the parallel with cardiology where diagnostic coronary angiography was a necessary prerequisite for coronary intervention training[8,9]; the group suggested a number of training requirements, which included, for example, interpretation of 200 computed tomography (CT) brain scans and 50 CT brain angiograms. Given the improved clinical outcome with mechanical thrombectomy in acute ischaemic stroke[10-12], it is likely that demand in ESN training will rise dramatically, far outstripping the supply of trained practitioners.

There is, therefore, a balance to be achieved. Clearly doctors who perform any specialist and high-risk

procedure should be competent prior to independent practice. However, the credentials necessary to establish such competence should be realistic and achievable. Concerns have been raised that established stringent requirements may have to be downgraded given the current low number of neurointerventionalists in training[13].

How do our established colleagues fit into all of this? Such established practitioners are said to have "grandfather rights". This concept exempts the individuals concerned from the new rules relating to credentialing. Whilst some may see this as unfair, it does recognise that they have already been practising in a subspecialised field for a long time, may have played a role in the development of technique and may have been involved in the creation of the credentialing qualification process themselves[6].

CREDENTIALING "TURF WARS"

A key issue in credentialing is when medical practice falls between two specialties or where no existing training pathway currently exists - here credentialing could help fill a training void.

For example in Australasia, a Diploma in Diagnostic Ultrasound is offered by the Australian Society for Ultrasound in Medicine to doctors from specialities such as obstetrics and gynaecology, emergency medicine and critical care. Although this may support increasing demand for these services, it risks deskilling the current generation of radiologists while indirectly affecting the training opportunities of the next generation[14].

An example of credentialing filling a training void is demonstrated in cardiovascular magnetic resonance imaging (MRI). It was argued in the United States that the "unique and complex nature of cardiovascular imaging" and the multidisciplinary practitioners in this field made guidelines and credentialing applicable to cardiovascular MRI[15,16]. These recommendations included training to achieve level Ⅰ, Ⅱ and Ⅲ competencies in the subject. In other words a new, complex and multi-disciplinary modality suits the use of credentialing as an assessment tool.

Fast-forward to the present day, and a similar discussion is being had in the field of positron emission tomography (PET) - MRI. The American College of Radiology and Society of Nuclear Medicine and Molecular Imaging have created a joint credentialing statement on the subject[5]. In the United Kingdom where nuclear medicine has been traditionally accredited by the Royal College of Physicians as well as the Royal College of Radiologists, the past two decades have seen training in nuclear medicine split between the two colleges. There is much common ground but the balance has tipped towards radiology recently[17].

However, there have been allegations over protectionism and misuse of credentialing to that aim. When recommendations for training in carotid stenting were produced in the United States, criticisms included the desire to protect the radiology turf, as radiologists had traditionally performed these procedures[18]. This raises the spectre of "turf wars" between specialities. The accusation becomes difficult to defend if: (1) the credentials are needlessly stringent; (2) there is a low clinical risk to the patient from the technique; (3) the training pathway is clearly laid out and achievable within existing frameworks; and (4) the subspecialist area is potentially lucrative, desirable or imbues status[6]. For example, it would be unusual to be asked about a logbook of 300 defaecating proctograms from the last year, but this is routine in United Kingdom PET/CT practice.

Examples of credentialing from around the world are demonstrated in Table 1. Furthermore, a case example of credentialing is shown in Table 2, demonstrating CT Colonography credentialing in Australia and New Zealand.

CRITICISM OF CREDENTIALING

Traditional apprenticeship-based medical training, typified by long periods of experiential learning, is being gradually replaced by shorter, more formalized competency-based training[19]. Competency-based training is at the heart of credentialing - an individual doctor shows they are competent in a particular area by proving that they can actually do it. It has many potential advantages, namely in clarity of purpose and ease of testing.

There has been long-standing concern that this approach may eventually turn medical training into a technical exercise rather than the educational well-rounded training that a doctor requires[20]. It has been argued that a competency-based model limits experience, intuition and higher-order competence, all of which are desperately needed by a modern doctor[18].

Furthermore, there is concern that competence-based training may breed mediocrity. Many have argued that we should "aspire to excellence" rather than just focussing on a uniform level of competence[19,21]. Pigeonholing people through rigidity can lead to a complicit tick box culture[19].

There is more damning criticism about the never-ending push for more structure, more testing and more documentary evidence to demonstrate competence. The criticism is that it interferes with training and learning, making it slow and inefficient. With the idea of credentialing creeping into medical education within the United Kingdom, there is a possibility that this will get worse.

Structure however does not necessarily mean better and there are many positive aspects to experiential learning, which current training methods have lost. Indeed in 2008 the United Kingdom's Tooke Report "Aspiring to Excellence" commented that: "The structure of postgraduate training should be modified to provide a broad based platform for subsequent higher specialist training, increased flexibility, the valuing of experience and the promotion of excellence[21]".

Promotion of excellence, flexibility and broad-based experience do not feature heavily in competency-based training or credentialing, often quite the reverse.

Table 1 Examples of credentialing in radiology across the world

Examples	Institute/country	Date
Brain PET/MRI	Joint statement: American College of Radiology and Society of Nuclear Medicine and Molecular Imaging, United States[5]	2015
Cardiac CT	British Society of Cardiovascular Imaging, United Kingdom[26]	2011
Cardiovascular MRI	Society for Cardiovascular Magnetic Resonance, United States[15,16]	2000, 2007
CT colonography	The Royal Australian and New Zealand College of Radiologists, through the Abdominal Radiology Group of Australia and New Zealand[27]	2013
Interventional radiology	Interventional Radiology Society of Australasia, Australia and New Zealand[28]	2008
Screening mammograms	Mammography Quality and Standards Act Program, United States Food and Drug Administration[29]	2015
Training in catheter-directed intra-arterial stroke therapy	Society of Interventional Radiology, United States[7]	2009
Training in Endovascular Surgical Neuroradiology	Accreditation Council for Graduate Medical Education Endovascular Surgical Neuroradiology training programme, United States[30]	2008, 2011, 2013
Ultrasound training standards	Royal College of Radiologists, United Kingdom[31]	2012

PET: Positron emission tomography; MRI: Magnetic resonance imaging; CT: Computed tomography.

Table 2 A complete case example of credentialing in radiology, from the Royal Australian and New Zealand College of Radiologists computed tomography colonography accreditation programme guidelines[27]

Modality/country and Institute	Credentialing requirements
CTC RANZCR, through the Abdominal Radiology Group of Australia and New Zealand, 2013[27]	Minimum of 60 CTC cases required by practitioner for independent performance: Cases should be worked up from raw data on a workstation by applicant 50 cases must be validated by surgery or endoscopy 10 cases should be "live" where: Practitioner must be personally present for duration of examination Must be supervised by a recognised CTC radiologist Practitioner must be named on examination report as the co-reporting CTC trainee Form of evidence: RIS record ± logbook Case training can be acquired through the following: Hands-on workshops Abdominal imaging fellowships On-site training *via* the supervision of a CTC specialist Mentored electronic library cases On-going competency: To maintain CTC competency a minimum of 30 examinations per year must be interpreted All cases worked up by applicant from raw data on a workstation All cases must be recorded in RANZCR CTC logbook In their annual RANZCR CPD returns CTC specialists must declare whether they have completed their on-going requirements. Their declaration will be subject to random audit and CTC specialists may be asked to provide evidence to substantiate their logbook recordings Those who do not maintain competency requirements will be suspended from the register, until a logbook of 30 cases is submitted[27]

CTC: Computed tomography colonography; RANZCR: Royal Australian and New Zealand College of Radiologists; CPD: Continuing professional development; RIS: Radiology information system.

THE UNITED KINGDOM'S STORY SO FAR

According to the United Kingdom's General Medical Council (GMC) there has often been a lack of clarity on what credentialing actually means. The lack of clear aims and agreement on how credentialing would work in practice has led to its limited uptake in certain parts of the world[6]. Despite this, credentialing is not a new concept within United Kingdom radiology.

In the United Kingdom, radiology trainees must demonstrate evidence of competencies and development at their Annual Review of Competence Progression in order to progress to the next year of training. They must pass all three parts of the Fellowship of the Royal College of Radiologists (FRCR) diploma. Having completed training and obtained the Certificate of Completion of Training (CCT) a consultant radiologist must then demonstrate continuing professional development in order to remain up-to-date and competent, as part of the newly developed 5-yearly revalidation process.

This certification and recertification process is arguably a form of credentialing, albeit in an unfocussed manner. Many countries, across the globe, are gradually adopting such processes, as stakeholders increasingly demand evidence of competence.

Within Europe, more generally, many countries do not

have an FRCR or CCT equivalent. Some sit the European Diploma of Radiology in order to obtain a physically tangible, transferable and widely recognised document that certifies a standard of general radiology deemed appropriate by the European Society of Radiology for independent practice.

Radiologists also favour accreditation for many subspecialist techniques. For example, cardiac CT already has an established training programme in the United Kingdom. Moreover in a 2012 national survey on CT colonography (CTC) in the National Health Service's Bowel Cancer-Screening Programme found that radiologists in the screening programme had almost all been formally trained in CTC (98%)[22]. Eighty-one percent of the radiologists who responded were in favour of accreditation for the procedure. The preferred way to do this was *via* periodic testing and many liked the idea of independent validation of their own practice[22].

THE FUTURE OF UNITED KINGDOM CREDENTIALING

The United Kingdom's GMC states that credentialing should be used when there is "a need to enhance patient safety which cannot be adequately addressed through other, non-regulatory means" but that it can also serve multiple other purposes[6]. Credentialing should be used in areas, such as in sports medicine, where there is limited regulation and a particular need is demonstrated. In order to fulfil this, the GMC has argued that four points must be met for credentialing to be considered: (1) credentialing should be introduced where patient protection cannot be met in other ways; (2) where there is a clear service need; (3) where it is practicable and feasible to develop a credential; and (4) where there is clear support from the relevant organisations in the field[6].

Indeed it should be remembered that: "Credentialing should be consistent with current indicative models of medical regulation. Possession of a credential should indicate attainment of competencies in a designated area of practice but not be a statuary requirement for practice in a particular field"[6].

In other words, if someone is board certified (United States) or has CCT (United Kingdom) then they have been judged fit to practice within that country. It could be argued that additional local credentialing is excessive, costly and inefficient. Furthermore, local layers of credentialing indirectly insinuate that national standards and existing professional qualifications are not fit for purpose.

Professor David Greenaway's recent report into the Shape of Training in England discusses the future of credentialing in much more detail: "In our proposed approach to training, some specialty training and all subspecialty training will be acquired through credentialed programmes once doctors have completed their post-graduate training"[23].

Crucially he argues that credentialing will allow cross-specialty development and that the availability to train or credential in specific areas should be based on local patient needs[23].

The Shape of Training report wants to go further and remove sub-specialisation and create credentialing instead but as part of an evolutionary process[22]. Rather than the vertical bottom-to-top training of old, it suggests doctors can train side-ways reflecting a broader focus with regional patient health care concerns mostly in mind.

Where this fits within mainstream radiology is a matter for debate. Although these proposals are still in their infancy, the prominence given to credentialing within the report means that it is likely that these concepts are here to stay in United Kingdom postgraduate medical training.

One extrapolation from this is that overall post-graduate training in a subspecialty is ignored in favour of individual competencies. This can then lead to professional post-graduate training being debased in favour of a "boy-scout" approach, where post-graduate training consists of collecting as many "badges" as they can.

Furthermore, credentialing is often based on fairly crude measures, such as numbers of cases. Such simplicity ignores vital issues such as case mix, difficult cases, understanding of pitfalls and so forth. Of course, such measures are easy to count but counting numbers is inadequate in assessing proficiency[24]. Many accreditation schemes base their outcomes on such easy to measure but fundamentally inappropriate metrics. The fundamental but occasionally difficult to measure topic is competent performance in the workplace. This is surely the goal of any accreditation process leading to credentialing.

THE RADIOLOGY PARADIGM

The Royal Australian and New Zealand College of Radiologists commissioned a report in 2006 in order to examine credentialing in radiology and how it could apply to Australia and New Zealand.

In this review they stated that they, "…searched the published literature for empirical evidence of the effectiveness of credentialing in improving and sustaining the safety and quality of radiology services. We found no empirical evidence for the benefit of credentialing in radiology…"[25].

In our own literature review, almost a decade on we have found nothing further in the literature to refute this statement.

Errors, or discrepancies, are an inherent part of radiology. However, feedback often only occurs by way of a discrepancy meeting or formal complaint. As error is inherent in radiology it could be argued that this fact makes credentialing all the more important in order to reduce error where possible.

Despite this, credentialing can be inherently expen-

sive. It is a significant drain on resources for those that create and regulate the credentials and for those that have to work through them. It is therefore important that we do not "over-credential" radiology.

Clearly, poor assessment of competence and a boy-scout approach to post-graduate training are undesirable. But given that accreditation, certification and other similar processes are already happening within radiology across the world, it cannot be ignored. Indeed, credentialing is welcomed when it protects patients, it is important that a neurointerventionalist has performed an adequate amount of intracranial angiograms to be competent to perform the procedure independently, minimising the risk of complication. Additionally, where radiology overlaps with other specialities, it is vital to ensure there is a standard level of competence, maintaining safe practice by radiologist and non-radiologist alike. Nonetheless one must remember the GMC statement that credentialing should be introduced where there is a service need, it is practicable to do so and where patient protection cannot be met in other ways[6].

Perhaps one way forward is to put all sub-speciality areas in radiology that currently have specialist training needs into a large overarching competency-based structure, complete with adequate description of competency-based outcome measures so as to allow a degree of uniformity across all subspecialties and fairness between them.

CONCLUSION

It seems credentialing is here to stay but it is difficult to say in what form. When used appropriately, it can be an excellent way to improve patient care or allow safe training in a new area. However, when used excessively and unnecessarily it can stifle growth of a subspecialist area, interfere with training and promote false competence. Credentialing in complex/dangerous procedures is welcomed. However it should not stifle routine practice and certainly shouldn't be used as a weapon in turf-wars between specialities.

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