European Radiology (2021) 31:5998–6000
https://doi.org/10.1007/s00330-021-07723-1

EDITORIAL

The vanishing radiologist—an unseen danger, and a danger of being unseen

Adrian P. Brady [1,2]

Received: 16 December 2020 / Revised: 24 December 2020 / Accepted: 27 January 2021 / Published online: 10 February 2021

Key Points

- *Radiology has developed into a central and important part of patient care.*
- *A combination of technological developments, increasing workload and radiologists' behaviour run the risk of diminishing the visibility of radiologists to referrers and patientsRadiology has developed into a central and important part of patient care.*
- *It is vital for the successful future of radiology that we remain conscious of the need to maintain visibility of who we are and what we contribute to patient care.*

While construction of a new wing of our radiology department is underway, most of my Consultant Radiologist colleagues have been temporarily relocated to a quiet out-of-the-way corridor elsewhere in the hospital, until our new offices are ready for occupancy. Their new corridor is accessible through a door with a key-pad lock, and their move there initiated a conversation about whether access to the corridor for referrers, radiographers and other colleagues should be by swipe-card or key-code.[1]

This led to me think about the visibility and accessibility of radiologists, attributes which have waxed and waned over time.

Diagnostic radiologists (and some other specialists) have sometimes been considered "peripheral" to clinical care. We have not traditionally been responsible for directly managing our own patients. In some ways, we have been viewed as "the doctor's doctor", providing information and direction to those who make the clinical decisions concerning their patients. Some radiologists may like it this way, enjoying the benefits of contributing to patient welfare, without what can be seen as the messy downsides of having to interact directly with patients as individuals.

Despite these misperceptions, radiology as a specialty has succeeded in establishing our importance in healthcare. The increasing power of our tools, our ability to use those tools to detect and diagnose disease, and the development of Interventional Radiology have all increased direct involvement of radiologists in patient care, increasing our visibility to patients and referring colleagues. Multi-disciplinary team meetings (MDMs) have moved radiologists to a central role in contributing to clinical decision-making. In many ways, the understanding of our role in adding value to healthcare is now at its highest level ever [1, 2].

Clinical practice has also changed in recent decades. Using investigations, including imaging, to support a bedside diagnosis (based on history-taking and clinical examination) has largely been replaced by a greater direct reliance on those investigations. In many circumstances, imaging has replaced (or at least reduced the use of) the traditional clinical tools of inspection, palpation, percussion, and auscultation. This has undoubtedly enhanced clinical care, and, *pari passu*, the centrality of radiology in medicine.

And yet, there are dangers that radiology may retreat or be pushed back into relative invisibility, and potential consequent peripherality. Our technological innovations may ultimately work against us.

1. Artificial intelligence (AI)—while many of the more over-wrought predictions of the impending demise of radiology [3, 4] carry little weight, the belief that

[1] By the way, my temporarily-relocated colleagues decided just to keep the door to their office corridor wedged open. Low-tech common sense prevailed.

✉ Adrian P. Brady
adrianbrady@me.com

[1] Radiology Department, Mercy University Hospital, Grenville Place, Cork T12 WE28, Ireland

[2] University College Cork, Cork, Ireland

radiologists can and will be replaced in the near future by algorithms is widely prevalent. This can act as a disincentive to otherwise-interested young doctors entering our specialty. Additionally, it carries the danger that colleagues in other specialties may be led to believe that our work can be done by algorithms acting independently, or directly by referrers supported by AI. Undoubtedly, AI will change what we do, and how we do it [5]. It is up to us to make sure that we remain central to the use of AI in radiology, and to delivery of care in the AI era. Above all, we must understand this new technology, ensure it is deployed safely and ethically, and that all involved grasp that it is a tool aiding better healthcare, not a replacement for human-led medical practice.

2. PACS and voice-recognition dictation have vastly speeded up the delivery of radiology reports, removing delays previously required to collate a patient's previous images, and to transcribe dictated reports. Undoubtedly this has been beneficial, but it has led to increased prevalence among referrers of the view that radiology is a service to be used much like laboratory tests: always and rapidly available, anonymously delivered, just another "test result". A friend of mine describes this as seeing radiologists as "FBC (full blood count) machines with a pulse". We have become hamsters on a wheel, running as rapidly as we can in one place, just to keep the wheel moving. In the pre-PACS era, referring clinicians looking for urgent reports or discussion of findings usually needed to visit the radiology department and interact face-to-face with the radiologist. This allowed the development of close working relationships, whereby referrers became used to the language used by specific radiologists, and radiologists gained an understanding of the specific needs of referrers [6]. A recent ESR survey of radiologists' perceptions of our role and identity identified increasing workload and lack of direct patient contact as significant threats to our standing and visibility [7]. The benefits of digitization are undoubted; we should nott allow these advances entrap us in an ever-accelerating cycle of demand and speed, thereby reducing direct interaction with patients and referring colleagues, and loss of the benefits built up by these relationships.
3. Teleradiology has been a boon to radiology and delivery of medical carein some circumstances. Provision of subspecialist opinions remotely can increase the value delivered by radiology in any location. Imaging services can be delivered to remote locations without a constant on-site specialist presence. Out-of-hours off-site rapid reporting can enhance imaging service delivery regardless of the time of day [8]. However teleradiology also introduces distance (physical and metaphorical) between radiologists and both referrers and patients. If used as a routine method of delivery of radiology service teleradiology risks diminishing radiology's value reducing radiologists from direct participants in medical care to disinterested producers of outputs (reports). To avoid damage to our standing caused by the use of teleradiology radiologists should work to educate payers and referrers that teleradiology is a valuable and helpful adjunct to on-site radiology service not a substitute for it
4. Structured reporting—some radiologists fear a move from prose reporting to structured reporting may reduce the standing of our reports in the eyes of patients and referrers from that of clinical consultations among colleagues (how we generally see our work) to the status of laboratory reports [6]. Nonetheless, the arguments for, and the trend towards structured reporting, are too strong to resist [6, 9], at least for complex subspecialist reports. We need to ensure that, while delivering what may be seen as "just another investigative output", we emphasise the additional value of our inputs into clinical care, which go far beyond the text or content of a report [1, 2].
5. Modes of communication have changed over the careers of older radiologists. Shannon Forrest, a pilot and aviation safety advocate, writes (about his industry) "Given that an entire generation has grown up using texting and electronic messaging as their primary form of communication — and as a result, has not developed social skills or human interaction etiquette to the degree of their predecessors — a new CRM (Crew Resource Management) problem may be looming on the horizon. Electronic learning certainly can teach the academic basics behind situational awareness, decision making and the like, but it is no substitute for good old-fashioned face-to-face CRM to address concerns, solve specific problems and remind flight departments that aviation is a team sport" [10]. The same can be said about our work—there is no substitute for face-to-face interaction with colleagues and patients. Younger radiologists have grown up in a world where remote, electronic communication is both easier and more pervasive than in the past. It is also easier to lose the benefit of human interaction in this world.
6. COVID led to greater "bunkering" of radiologists, working behind closed doors, to avoid the risk of infection and consequent depletion of available staff numbers ("on-site" distancing). Off-site teleradiological reporting also increased. Many of us moved rapidly from a situation where we had daily face-to-face contact with referrers and colleagues, to one where our only communication with others was over the telephone. This made sense in the early phase of the pandemic; we needed to ensure the capacity of radiology departments to continue to function, and unnecessarily risky behaviour of key workers had to be curtailed. Furthermore, the use of online capabilities permitted maintenance of multidisciplinary conferences during the pandemic, preserving standards of care. But,

for the reasons given above, we should nott allow this way of working to become the norm. The COVID pandemic is not normal life; medical practice mandated by it should equally not become the norm, beyond what is necessary in the (hopefully) short term.

The notion of working in peaceful isolation, spending a given number of hours daily in front of a workstation, producing meaningful and valuable output before packing up and going home, can be attractive. In some circumstances, we may be more productive (if productivity can be counted in reports generated) in this type of environment. After all, we do not need much more than regular coffee and a dark room to do a lot of what we do. But if we acquiesce in (or actively work towards) our work style becoming more isolated, solitary, and workstation-dependent, we do a disservice to ourselves, our patients and our future colleagues. We have spent many decades striving to bring radiology to the centre of patient care. That is not going to change any time soon, but what could change is the perception of the contribution of radiologists. If we are hidden away in an office, rarely meeting patients or referrers, it is only a small step to being forgotten. We will still produce reports, which will still be important, but we may find ourselves emerging from our bunkers in the future, troglodytes blinking as we encounter daylight, strangers to those with whom we once spoke, peripheral to any decisions about resources or planning, having lost our standing to others who have taken advantage of our invisibility.

So, however much our technology, work circumstances and inclinations may conspire, let us not allow ourselves become the recluses of medicine. We cannot expect recognition for our contribution if we hide from view. By being aware of the risks and dangers of invisibility, we can mitigate them, and continue to represent our specialty positively, and in plain sight.

Funding The authors state that this work has not received any funding.

Declarations

Guarantor The scientific guarantor of this publication is Dr Adrian Brady.

Conflict of interest The authors of this manuscript declare no relationships with any companies whose products or services may be related to the subject matter of the article.

Statistics and biometry No complex statistical methods were necessary for this paper.

Informed consent Written informed consent was not required for this study because it is an editorial.

Ethical approval Institutional Review Board approval was not required because it is an editorial.

Methodology
• Editorial

References

1. Brady AP, Brink JA, Slavotinek J (2020) Radiology and value-based healthcare. JAMA. https://doi.org/10.1001/jama.2020.14930
2. Brady AP, Bello JA, Derchi LE et al (2020) Radiology in the era of value-based healthcare. A multi-society expert statement from the ACR, CAR, ESR, IS3R, RANZCR, and RSNA. Insights Imaging. https://doi.org/10.1186/s13244-020-00941-z
3. https://www.youtube.com/watch?v=2HMPRXstSvQ. Accessed 19.11.20
4. Brady AP, Neri E (2020) Artificial intelligence in radiology – ethical considerations. Diagnostics (Basel) 10(4):231. https://doi.org/10.3390/diagnostics10040231
5. Geis R, Brady AP, Wu CC et al (2019) Ethics of artificial intelligence in radiology: summary of the Joint European and North American Multisociety Statement. Insights Imaging 10:101. https://doi.org/10.1186/s13244-019-0785-8
6. Brady AP (2018) Radiology reporting – from Hemingway to HAL? Insights Imaging 9:237–246. https://doi.org/10.1007/s13244-018-0596-
7. European Society of Radiology (ESR) (2020) The identity and role of the radiologist in 2020: a survey among ESR full radiologist members. Insights Imaging 11:130. https://doi.org/10.1186/s13244-020-00943-x
8. Brady AP, Becker CD (2019) Teleradiological outsourcing – compromises and hidden costs. Eur Radiol 29(4):1647–1648. https://doi.org/10.1007/s00330-019-6014-5
9. European Society of Radiology (ESR) (2018) ESR paper on Structured Reporting in Radiology. Insights Imaging 9:1–7. https://doi.org/10.1007/s13244-017-0588-8
10. Forrest S (2018) What happened to Crew Resource Management? Flight Safety Foundation, October 26, 2018. https://flightsafety.org/asw-article/what-happened-to-crew-resource-management/. Accessed 19.11.20