

Value-Based Radiology: A New Focus to Optimise Impact



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VALUE-BASED RADIOLOGY: WHAT AND WHY?

Doctors have always liked to believe that what they do benefits their patients. It is, after all, intrinsic to our mission to "first, do no harm." Over the centuries, however, doctors have not always achieved this goal. Cupping and trepanning, for example, have not stood the test of time. Actually, attempting to measure the specific value to patients and to society of our interventions is a relatively recent development. Certainly, applying scientific principles to evaluating the safety and efficacy of medical interventions has been the standard for quite some time; however, going beyond diagnostic or therapeutic efficacy to consider the value created is quite a recent approach in medicine, and one that is still in development.

The concept of measuring value in healthcare, and moving towards a system whereby resources are dependent on value creation, owes much to the work of Michael Porter and his colleagues at the Harvard Business School, Boston, Massachusetts, USA, over the past 20 years, exemplified in his review paper on the

topic in 2010.¹ The fundamental idea involves moving away from resourcing being based on the volume of care delivered to one where it reflects the value delivered to patients and society.

Value as a concept in medicine can be difficult to define. Broadly speaking, to quote Warren Buffett: "Price is what you pay, value is what you get."² Much of the recent impetus behind the growing value-based healthcare movement is driven by the inexorable rise in the cost of healthcare in many countries, well in excess of the cost-of-living inflation. Between 1970 and 2020, healthcare expenditure in the USA rose from 6% of gross domestic product to 18%. In many other high-income countries, the increase in the same period has been 5 to 11%.³ This trend is not sustainable; therefore, doctors must find some way of increasing the value of the care delivered without incurring additional costs and of making expenditure go further by ensuring it contributes positively to patient outcomes and society.

This applies to radiology as much as, or more than, other specialties. The increase in radiology utilisation in recent decades has been rapid.⁴ Much of this is due to the constantly expanding

ability of radiology to identify and define illness, but not all of this increase contributes usefully to outcomes. A particular difficulty for radiologists in attempting to ensure the value of what is done is that much of a radiologist's work is influenced by factors beyond our control. Radiologists respond to referrers' requests and often lack the knowledge of patients' particular circumstances required to provide the freedom to decline requests or to suggest alternatives. Therefore, value-based radiology (VBR) must not only define and measure the value of a radiologist's work but must also influence referrals to optimise value.

So, let us consider what constitutes value in healthcare, including in radiology. It is about much more than reducing the costs of service delivery. In 2019, the European Commission defined value-based healthcare as being supported by four pillars:⁵

- Personal value: appropriate care to achieve patients' personal goals
- Technical value: achievement of best possible outcomes with available resources
- Allocative value: equitable distribution of resources across all patient groups
- Societal value: contribution of healthcare to social participation and connectedness

As doctors move from what helps an individual patient (personal value) to what benefits society as a whole (societal value), the value derived from healthcare is delivered to greater numbers of people. Thus, if doctors can identify healthcare interventions that can contribute societal as well as personal value (this may include restoring an individual to health so that they can continue to contribute to their family and society), doctors can enhance value delivery.

VALUE-BASED RADIOLOGY: HOW?

How could these principles be applied to radiology? The European Society of Radiology (ESR) has been very active in VBR, publishing a concept paper on the topic in 2017⁶ to introduce VBR to members and to initiate the consideration of how doctors can influence a pivot from

volume to value. Radiologists cannot expect that they can define what constitutes value to their patients; therefore, in 2019, the ESR surveyed patients across 22 countries to ask what aspects of radiology service delivery were of value to them.⁷ The most common answers contained the expected responses (i.e., that there be no errors in diagnoses, the appropriate study be performed, diagnoses be delivered quickly, etc.); however, prominent among the feedback were items that might not have come immediately to radiologists' minds, such as that radiologists should be available to discuss imaging findings directly with patients.

Radiologists may believe that we deliver value by reporting imaging studies accurately and promptly, and we do, but patients are often unaware of that valuable contribution if they have no direct interaction with radiologists. Patients perceive the capacity to discuss a radiologist's findings as being an additional component contributing value beyond the radiologist's identification of those findings. Direct discussions about radiology findings between radiologists and patients will neither be required nor feasible in most circumstances; time, opportunities, and resources will often be lacking. Therefore, radiologists should not seek to impose ourselves into the middle of clinical relationships that already exist between referrers and patients. Conversely, there will be circumstances where taking the opportunity to engage directly with patients, ideally in conjunction with the referrer, will facilitate better understanding of the meaning of imaging findings, and, as a secondary gain to the specialty, enhance patient awareness of the contributions of radiologists. Patient representatives are increasingly seeking this possibility;⁷ radiologists must try to meet that desire.

In 2019–2020, the ESR initiated and led a multisociety project with major radiology societies from North America, Australia, and New Zealand (American College of Radiology [ACR], Radiological Society of North America [RSNA], Canadian Association of Radiologists [CAR], Royal Australian and New Zealand College of Radiologists [RANZCR], and International Society for Strategic Studies in Radiology [IS3R]) to elaborate a joint multisociety statement on VBR.⁸ This considered the many ways in which

radiology creates and delivers value to patients, and proposed practical actions that radiologists can take as a specialty to enhance value delivery. Delivering value in radiology is greatly dependent on co-operation with the referring doctors. With that in mind, the societies also jointly wrote a viewpoint article in a major medical (non-radiology) journal,⁹ in an effort to initiate discussion with referrers and begin the process of joint work to enhance value.

In 2021, the ESR considered those activities in which we were already engaged in and that contribute value, and also what measures we could take in the near future to expand radiology's value contribution.¹⁰ Most recently, the IS3R convened retreats involving radiology, industry, and patient representatives to define strategies to influence behaviours of patients, referrers, and radiologists in order to increase value and facilitate measurement of value created. This work is ongoing.

VALUE-BASED RADIOLOGY: WHERE?

The value delivered by radiology to individual patients and to society encompasses both those aspects of a radiologist's work that are considered the traditional role, such as disease detection and diagnosis, and also broader and less immediately obvious contributions. Radiologists have a role in disease prevention by providing population screening for some conditions and by ensuring radiation protection standards are met. Radiologists must also include the reassurance provided to many patients and referrers by imaging that does not identify serious disease; while there are many reasons not to use imaging to exclude disease in patients without specific clinical indications, providing reassurance can be therapeutic and can enhance lives.^{8,9}

Another important value contribution by radiology relates to monitoring the effectiveness of treatment and prognostication. By using imaging to differentiate responders from non-responders to specific treatments for many diseases, therapeutic pathways can be adapted to individual patients and outcomes can be positively influenced. Imaging can contribute to early identification of those patients who fail to

respond, allowing enhancement of life quality by ceasing treatments associated with morbidity and refocusing on good palliation.^{8,9}

Communication represents an underappreciated component of value delivery in radiology. In many respects, much of the work of a diagnostic radiologist involves the sifting of imaging data to derive useful information, and then communicating that information to others in a manner that influences management. Given the constant pressure of work created by ever-increasing imaging volumes, it is all too easy to lose sight of this need for effective communication and to believe that a radiologist's job is done when we have reported findings of a study. Paying attention to the content, style, standards, and clinical relevance of the reports that are generated¹⁰⁻¹² to ensure the full importance of those reports is clearly understood by the referrer and using technological tools effectively to communicate unexpected, urgent, or critical findings can add value beyond report generation itself. Using multidisciplinary team participation to ensure that radiologic findings and options are fully considered in decision-making is one of the most important value creators available to radiologists. Taking all the opportunities to communicate directly with patients (which the ESR knows, from our survey, to be desired by patients)^{7,10} can enhance value in helping patients to understand the role and capabilities of radiology in their care, and the relevance of their findings. Implementing this will not be easy, but radiologists must advocate for the resources and opportunities to allow such communication to take place if radiologists wish patients to understand our role and contributions.

What practical actions can radiologists take to add value? We should promote integration of clinical decision support tools such as the ESR iGuide¹³ into requesting pathways for radiology studies. Such support tools should include the option of not requesting imaging, where imaging is unlikely to contribute usefully or answer the question being asked. Building in such expert-moderated guidance can reduce inappropriate imaging and increase timely use of the right test at the right time. As part of this initiative, radiologists should engage as much as possible directly with referring doctors, discussing individual patients and circumstances, and

thereby guiding them to justified, effective use of available radiologic modalities and expertise. Radiologists must pay attention to the justification of exposure to ionising radiation; pressure of work can often make it easier to just do what has been asked for, but by always ensuring appropriateness of imaging, radiologists contribute value to each patient and the population as a whole. Increasing availability of low-dose CT techniques can inculcate a belief among referrers that radiation doses are no longer a significant concern. However, radiologists must maintain caution about all radiation exposure and educate referrers that any inappropriate exposure should be avoided, however low the dose.

Radiologists must provide data to demonstrate the positive impact of our work on individuals and society. This will involve adapting much of the research we do from the lower-impact tiers of demonstrating technical or diagnostic efficacy of a particular technique or study to higher-impact measures, showing its impact on patient and societal outcomes.^{8,14} This will not be easy; identifying the specific impact of radiology within a multispecialty programme of care for a patient is challenging.⁸ Nonetheless, radiologists can and must design research studies to achieve this if we want to have their contribution recognised.

Restricted investment in radiology can produce bottlenecks, reducing overall system efficiency;⁸ for example, requesting cross-sectional imaging for a patient attending an emergency department increases their average length of stay.¹⁵ If hospital-based imaging facilities are insufficiently resourced to deal with demands rapidly, the efficiency of expensive hospital-based care is compromised. Furthermore, a failure to resource imaging services to provide appropriate access to primary care or outpatient referrers results in increased reliance on more expensive hospital-based care.⁸ Radiologists must act as advocates to managers and funders of healthcare to ensure adequate resourcing of our services to meet justified demand. Reductive views of the role of radiologists as being solely producers of reports on imaging studies are common. Radiologists must be vocal in explaining to those who make resourcing decisions that their role, and the

value we contribute, encompasses much broader inputs into healthcare, and that the maximum value of radiology can only be realised by providing sufficient resources to fulfil their role in as complete a manner as possible.¹⁶

Within radiology departments, radiologists must ensure that resources are utilised for maximum benefit. If patients need access to 24 hours a day, 7 days a week emergency care, radiologists must configure our services to provide that (and must be resourced to do so). Radiologists must avoid temptations to isolate resources for the benefit of particular subspecialties or groups of patients if those same resources can be used more efficiently for every patient; siloed budgets and subdepartments may not be the best use of expensive equipment and staff.⁸ Radiologists must always be open to considering what we could change to increase value. Key to this is maintaining a constant culture of quality improvement, auditing diverse aspects of services, and adapting them where this would help us increase standards.¹⁷ Radiologists must take every opportunity to play an important role in multidisciplinary team decision-making as an intrinsic part of our work rather than an unwelcome intrusion on reporting activity.¹⁶

VALUE-BASED RADIOLOGY: WHO?

Ultimately, creation and enhancement of value in radiology is a joint responsibility of all concerned. Radiologists can do much to enhance value (some suggestions are given above) and must stay aware of evolving concepts of value and the metrics used to assess it. Referrers must engage with radiologists to ensure that their requests for radiology services are supported by evidence, justified, and optimised to the particular circumstances of a given case. Patients must be educated and supported to understand that more elaborate, more expensive, or simply more imaging may not always be the best application of resources to their particular clinical need at any given moment in time. All involved parties must appreciate that resources are finite, utilisation must be matched to availability, and critical evaluation of value must be part of every application of radiology to patient care.^{8,9}

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