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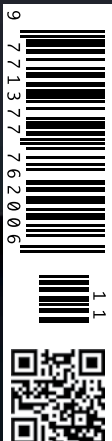
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Delivering High-Value Imaging: A Paradigm Shift from Efficiency to Effectiveness

Summary: How can radiologists move towards a model of practice that uses resources and skills effectively and supports high-value care? A leading radiologist and population health scientist explains.



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Medical imaging technology has made tremendous advancements, enabling the accurate diagnosis of various diseases and conditions. In many instances, imaging is critical for diagnosis, determining appropriate management, and triaging patients. Today, no ED physicians would diagnose pneumonia by solely listening to lung, or appendicitis by physical examinations, or pulmonary emboli by calculating risk factors. Imaging has become the GOLD standard for many conditions.

Accordingly, the utilisation of imaging has grown dramatically in the past few decades. At first, this was accompanied by higher levels of reimbursement, but, more recently, various payment reforms have reduced the payment for medical imaging in the United States. Reduced payment for the continuous body parts, known as bundled codes, is a good example. We experienced tremendous financial impact by combining the CT scans of abdomen and pelvis in 2009. Bundled payment for care improvement initiatives is a different type of “bundle” that enforces a single payment for inpatient care provided three days prior to admission to 30 days post discharge in one single payment, beyond traditional diagnosis-related group-based payments (DRG) from admission to discharge. Payment for imaging performed during the period is included in the bundled payment with surgery and anaesthesia. At the same time, the total imaging volume per case has increased dramatically, in part due to the advancement of technology. Radiologists must

detect and interpret a huge volume of information and create a cohesive single report in a short period of time. Radiologists are faced with handling larger volumes with declining unit reimbursement in order to maintain their level of compensation. This creates a “mouse-in-a-wheel” phenomenon where we run endlessly, leading to burnout.

The past focus has been efficiency or how to do things faster, ie improve exam room utilisation for the maximum capacity and report turnaround time to sign off reports faster. These are great business strategies under a fee-for-services payment model where the more we do, the more we get paid. Under this volume-based care model, very little attention has been paid to doing the right thing.

The time is right to focus on making our work more effective. Effectiveness can be understood as doing the right things; the right test (appropriateness), the correct diagnosis (diagnostic performance), a positive impact on treatment decisions (diagnostic impact), and ultimately making patients healthier (therapeutic impact). Focusing on effectiveness allows us to achieve better outcomes and demonstrates how imaging impacts the entire patient care continuum.

How Do We Make Radiology Practice More Effective?

While many things can help us shift from efficiency to effectiveness models, I would like to illustrate three options that we can make a huge impact:

1) Focus on Appropriateness

We must take the lead on ensuring the appropriate use of imaging tests. Under the volume-based care, there is incentive to do more imaging tests. We may be too busy to address the appropriateness of imaging orders, therefore it is easier to just “do it” instead of spending time discussing appropriate imaging test with ordering providers. It is important to note that this has created a culture of an “imaging order” akin to a takeaway order of food, which is both demeaning to radiologists and not the best care for patients. The editorial by Bruce Hillman in JACR entitled “Speaking of Language” (Hillman 2015), highlights the notion that words matter. The word, “order” does not get respect. A proper word might be “consultation” since we are physicians with imaging expertise.

“RADIOLOGISTS HANDLE LARGER VOLUMES WITH DECLINING UNIT REIMBURSEMENT TO MAINTAIN THEIR LEVEL OF COMPENSATION CREATING A MOUSE-IN-A-WHEEL PHENOMENON AND LEADING TO BURNOUT”

Admitting that the majority of imaging tests are 'ordered' appropriately, there remain 20-30% of imaging orders that are either wrong tests or inappropriate. Imaging CDS (clinical decision support) provides automatic consultation of relatively simple clinical scenario, such as 'low back pain lasting more than six weeks despite conservative management'. For complex situations, however, we must provide consultation services where radiologists speak with ordering physicians what imaging test best answers a clinical question. No matter how fast we sign a report, if the study was not indicated to begin with or was the wrong test to address the clinical question, we did not make an impact on patient care (other than adding more waste to healthcare delivery). This type of practice does not lead to effective imaging services. The imaging appropriateness is likely enforced more strictly

in other countries where the availability of MR, CT, or PET scans is limited or there is strong government oversight.

2) Standardised Imaging Reporting Results

Outside of interventional radiology, imaging reports are the only product we produce in diagnostic radiology. Despite the tremendous technological advancements in the field of medical imaging, narrative forms of radiology reports have not changed for over 120 years. We use a variety of adjectives or adverbs that are not well defined as to the probability of disease, such as 'likely', 'probably', 'may represent', 'possibly', or 'cannot be excluded', etc.

Physicians who receive radiology reports have to guess what these terms might imply. Under the efficiency model, what matters is how fast we sign reports, not how accurate or actionable our reports are (effectiveness). How do we make our reports more actionable?

The best example for making our reports more actionable is the breast imaging reports and database (BI-RADS) used for screening breast cancer. The probability of presence of cancer is categorised by five different numbers. Radiologists have to commit to one out of five numbers for every single report for breast imaging. The BI-RADS system has made imaging an essential and unequivocal part of the breast cancer diagnosis and management. The categorisation of diagnosis (or probability of disease) has also generated the solid foundation of a research database. Furthermore, the RADS system is intimately linked to proper follow-up actions, allowing the standardisation of care process. There are many other RADS systems, such as LI-RADS (liver imaging), PI-RADS (prostate imaging), TI-RADS (thyroid imaging), and NI-RADS (neck imaging), etc. These RADS systems are applicable to specific situations where a diagnosis is binary such as cancer or not cancer, or recurrence or not recurrence. When a clinical question is not binary, RADS system, however, would not be applicable.

It is understandable that some radiologists feel that these RADS systems represent an unwelcome pressure to commit to a number despite what might be more nuanced findings. Generally, people are reluctant to change their practice unless there is additional payment or an external mandate. RADS systems do not require specific structured reporting. They can still include narrative reporting but, in the end, the radiologist must commit to one number to reflect the probability of disease based on imaging.

Imagine a clinical history is 'left frontal lobe tumour' and an MRI report describes findings but, ultimately, the impression simply states 'left frontal lobe tumour' without addressing differential diagnosis or probability of high-grade tumours. This means the post-test probability did not change from the pre-test probability. In this scenario, the diagnostic impact is zero.

3) Effective Communication

Lack of effective communication is one of the major causes of medical errors and patient harm. This is beyond radiology and pathology, but happens at the point of transition of care. When a care team changes or a patient is discharged, critical information may never be conveyed to the care providers. Radiologists know how hard it is to get in touch with providers in order to verbally communicate critical imaging findings.

Another example is incidental findings in medical imaging. A variety of guidelines exist regarding a recommendation for follow-up examinations. These guidelines, such as Fleischner society guidelines, are incredibly powerful as they standardise care processes based on imaging findings. If adopted effectively, they provide the model for best practice.

One question is, are guidelines like these enough? What if a patient who has smoking history gets a chest CT to rule out PE (pulmonary emboli) at ED, and the chest CT was negative for PE but showed an 8 mm lung nodule? The radiologist would recommend a follow-up chest CT based on the Fleischner society guidelines. We might give ourselves a pat on the back that we did the right thing. However, how do we, as a health system, know that the patient received an appropriate follow-up examination? Should an ED physician be the one to place another chest CT at six months? Should this be a primary care provider's responsibility? What if the patient does not have a primary care provider? Should we directly inform the patient about the nodule? The series of questions points to the challenges facing every healthcare delivery system and suggests how we might organise ourselves for better patient care.

Data indicates that 20 to 30% of recommendations on incidental findings are not followed or are ignored. For incidental thyroid nodules, the rate can be as high as 70%. You could argue that incidentally discovered thyroid cancer is indolent, though a small fraction of patients could end up with aggressive thyroid cancer that requires extensive treatment. How do we know which one to ignore and

which one to work on? One can argue that is an opportunity for an IT solution, such as a reminder in the EMR to warn that the test is due.

Health policy makers may be concerned that the work up for incidental findings could increase imaging utilisation. However, the detecting lung cancer that is resectable leads to better outcomes and lower costs, than diagnosing it when patients become symptomatic. We need to think cohesively about how we use our resources effectively to provide better care.

In summary, radiologists should consider themselves as imaging information specialists, who observe medical findings that no one else in the care team can. It is our responsibility to work with other healthcare providers, system leaders, and patients to discuss not only how to make a diagnosis but also how we deliver high value imaging services effectively. ■

KEY POINTS



- The utilisation of imaging has increased over the past few decades.
- A fee-for-services payment model has led to burnout and little focus on doing the right thing.
- Appropriate scans, standardisation of reports and better communication at the point of care transition can lead to more effective radiology practice.
- Radiologists should adopt the role of imaging information specialists for better care delivery.



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