Value-Based Imaging: Past Impacts and Future Directions

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Introduction
In medicine, healthcare professionals are often tasked with seeing patients for short periods, needing to do their best to disseminate out what may or may not be wrong with them. In emergent cases and scenarios, the normally allotted time and scope of knowing the patient diminishes rapidly. Clinicians regularly utilize imaging studies as a first step in their treatment plan, especially in cases of non-specific pain [1]. Over time, the field of medicine has devolved into a world in which imaging studies are ordered almost as a prerequisite for beginning any sort of differential. In the literature, value-based care and evidence-based imaging studies and cases are on the rise as clinicians from all fields are beginning to understand the poor, unnecessary, and at times, harmful nature of this mindset.

Recently, a case report was published by Akkihal et al., expressing exactly this. The case described a common patient with non-specific back pain who presented to the emergency department and underwent various tests and imaging performed on them unnecessarily [1]. As this is not an uncommon occurrence, it was seen in a 2020 study that after surveying both clinicians and patients, it became clear that both parties believed in the importance of imaging [2]. In this study, however, patients showed a clear lack of understanding of the harms that may present with extra and/or unnecessary imaging studies; in many instances, patients feel inclined to believe the assumed necessity that an ordering clinician may impose [2].

Understanding Value-Based Care in the Context of Imaging
Defining “value” for an individual patient's circumstances can vary drastically; some place a higher premium on peace of mind or hopes for additional information, whereas others value minimizing exposure risks or cost, oftentimes regardless of what the evidence base demonstrates regarding the diagnostic utility of a specific imaging procedure. The definition of “value-based care” from the healthcare perspective is inseparably melded to metrics such as effectiveness and efficiency, timeliness, safety, patient focus, and equitability [3]. In recent years, value-based healthcare has been reduced to a framework for improving individual patient health outcomes per unit of expenditure [3]. As cited by Brady, et al, the European Commission Expert Panel proposed a four-pillar model to move the discussion away from value-based pricing to a broader definition of value-based healthcare, which includes [3]:

- appropriate care to achieve patients’ personal goals (personal value)
- achievement of best possible outcomes with available resources (technical value)
- equitable resource distribution across all patient groups (allocative value)
- contribution of healthcare to social participation and connectedness (societal value)

While focusing on identification of practices that optimize the ratio between health gained and healthcare cost, adoption of the European Commission's four-pillar model can help to ensure that inflation does not make current healthcare systems unsustainable, while maintaining or continually improving patient outcomes [3].

The Current Gap in Care
When proposing improvements to value-based imaging practices, healthcare professionals should first understand, then communicate to patients that evidence and value are independent factors [4]. This independence of value and evidence has been explored extensively by Seidel, et al. The application of a proposed two-dimensional evidence and value matrix presents compelling evidence that justifies allocation of the additional funding needed to generate an adequate evidence base, which is necessary to positively influence decision-making at institutional and provider levels, and
Lack of an adequate evidence base, or the necessary funding to develop further clarifying evidence, is in many instances used to deny the use of specific diagnostic imaging modalities to patients that could potentially benefit from imaging [3]. The same rationale is often applied to reimbursement decisions for patients, providers, and institutions.

Where some lack access to imaging due to institutional decisions, provider decisions, insurance decisions, or other factors, some have access to high quality imaging, and the decisions to utilize these resources is not based on evidence and value-based imaging criteria. Some of the predictors for ordering low-value imaging studies found by Hong, et al include clinician specialty, imaging for the prior patient, ownership of imaging equipment, and very high rates of low-value imaging for other clinical scenarios [4].

Other studies conducted to analyze the impact of both patient and provider beliefs regarding imaging on their decision-making process found that these beliefs are often at odds with the evidence that indicates for certain conditions as diagnostic imaging often adds little value to clinical decision-making or patient outcomes [5]. According to Sharma, et al, these beliefs could be important drivers of overuse of imaging and key targets for intervention [5].

One survey conducted by the European Society of Radiology (ESR) evaluated the perspective of 400 patients from 22 countries [6]. Most expressed general satisfaction with the radiological services they received, but feedback regarding certain aspects of the radiological services helped indicate important areas for potential improvement, as well as possible further insight into “why” deviations from evidence and value-based radiology occur [6].

- Thirty-six percent of respondents reported that they were not satisfied with the information provided about the risks and benefits of procedures.
- Thirty-three percent reported not being satisfied with the availability of radiologists for consultation, potentially suggesting that some patients lack sufficient information to participate fully in treatment decisions. Patients were often unaware of what information they were entitled to receive.
- Over eighty percent of respondents were unfamiliar with the concepts of value-based radiology and/or value-based healthcare.

This information demonstrates that patients highly value information and communication with their providers and often desire communication from the radiologist involved in their imaging, specifically. Lack of communication was found to be a cause of dissatisfaction in many cases, which could suggest a means of improving patient outcomes as measured by value-based healthcare metrics [2].

**Conclusions**

At face-value, the concepts of value-based healthcare and evidence-based imaging makes logical sense to most clinicians, and yet, the subject still remains debated and further discussed to the point of absurdity. Patients desire the best care possible, and as the cost of healthcare continues to rise in many nations like that of the United States, “the best” does not necessarily equate to “more” when it comes to imaging studies. There is a plethora of studies that can be found which showcase the importance of value-based healthcare and evidence-based imaging as well as the unnecessary excess of imaging studies ordered by clinicians. Hong, et al goes to state that in order to address the role of imaging as a social phenomenon for individuals with pain, clinicians require strategies to legitimize these patients’ experiences without the overuse of diagnostic tests [5]. Communication, collaboration, and consultation with imaging experts should become a more-widely utilized tool by clinicians before making imaging decisions on behalf of their patients, as was indicated in the ESR study. It is the position of the authorial team to urge clinicians to consider all aspects of a patient’s situation before making imaging decisions, and to work more collaboratively with local radiologists to involve them in the imaging process. If clinicians can collectively move towards a more value-based care model, especially when involving imaging, the patient’s quality of care can drastically be improved.

**References**