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Converging imaging data
with medical knowledge

BY JEFF VACHON

Patients are undergoing more medical imaging studies than ever before, which has resulted in a significant increase in the cost of healthcare delivery. This trend will likely continue as technological advances shorten scan times, reduce modality prices and cut radiation doses.

Added pressures will likely emerge from new, evidence-based guidelines that prescribe imaging for specific indications and follow-up examinations at set intervals.

To manage the growing demand, imaging departments will need to drive efficiencies and improvements in patient workflow and procedures.

Accomplishing this requires access to multi-disciplinary patient data from across all corners of the healthcare organization.

Unfortunately, 80 percent of this data is unstructured and the rest is often locked in information silos with proprietary data schemas and varying degrees of interoperability.

As a result, manual cross-referencing of requisitions and radiology reports is typically required to ensure appropriate indications are followed and that appropriate follow-up recommendations are communicated, scheduled, and performed. Manually extracting the data is, however, a highly labour-intensive and costly process.

If you could converge your imaging data with the information extracted from narrative text, reports, and clinical notes, you would be able to automate many of these processes. You could also provide clinicians and managers with a new level of clinical intelligence.

Medical imaging data combined with clinical knowledge goes beyond traditional operational and performance analysis to enable deeper insights and understanding of clinical procedures and outcomes.

In this model, medical data is a combination of clinical patient data, cohort studies and medical images, while medical domain knowledge encompasses clinical guidelines, side-effects of medications, causal relations, and so on.

By correlating and structuring data within and beyond radiology a new and significant breadth and depth of understanding can be achieved that has never been possible before.

The convergence of clinical and business data provides a new level of 'big picture' intelligence that enables the achievement of significant improvements in workflow efficiency, clinical outcomes and financial performance by:

• Proactively monitoring and reporting upon clinical follow-up recommendations and incidental findings to elevate care quality and protect against lost revenue.

• Providing improved awareness and insight into imaging operations to drive continuous clinical and workflow improvement across the organization.

• Expand awareness into patient imaging populations, practice management and practice guidelines such as Choose Wisely recommendations.

• Curating clinical and technical data for later use in artificial intelligence (AI) and machine learning (ML) applications.

Mining radiologist's findings: It has been reported that between 8 percent and 15 percent of radiology reports contain clinically important follow-up recommendations. Unfortunately, the rate of adherence to these prescribed recommendations remains low, with some research reporting that more than 35 percent never occur. This is particularly true for recommendations related to incidental findings, and even more so for those patients who do not have a primary care provider.

There are a number of avoidable pitfalls that result in missed follow-ups, including the failure to appropriately communicate findings and recommendations to patients or their primary care providers, failure to track less urgent follow-up recommendations during acute episodes of care, or failure to secure a scheduled appointment with the patient at the time the recommendation was made – and before the patient leaves the care facility.

Missed follow-up recommendations carry two significant consequences for both care-providers and patients. Most missed follow-ups introduce the opportunity for clinical and medico-legal risk should a malignant disease progress unnoticed. As well, this results in lost revenue opportunities when exams are not performed at all or are performed at an outside hospital or clinic. Gaining a 'big picture' view across all corners of the healthcare enterprise is an essential requirement for hospitals and healthcare organizations to achieve truly transformative clinical and business results, which can only be achieved when imaging and business data converge with deep clinical knowledge.

Jeff Vachon

Only then can you deliver cross-functional, multi-disciplinary insights that inform quality of care and efficiency improvements, drive cost reductions, and maximize reimbursement potential and ROI for clinical, technical, and operational initiatives.

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