



WHITE PAPER | HEALTHCARE AND LIFE SCIENCES | CLOUD

# Health Care Clinical Imaging Data

Point of View

# An overlooked revenue source in the healthcare enterprise: The image data archive

The search for cost savings and revenue opportunities is never-ending for a health system. Most have exploited the finite number of operational cost-cutting measures that could have meaningful impact on the bottom line. New spending freezes, staff reductions and resource management initiatives alone will not yield enough cost savings to help health systems flourish in value-based care. Less than 23% of health system executives think these actions can deliver substantial results.<sup>1</sup>

Health leaders are increasingly looking to data to better understand resources, revenues and risk, but one type of data has yet to be explored—imaging data. The stores of patient data under the stewardship of a health system are ripe with opportunity. Image data archives, in particular, represent one of the largest and mostly untapped sources of data to identify opportunities for both saving costs and generating revenues.

The use of discrete clinical data has seen considerable advances, with the exception of imaging data. But combining medical imaging and artificial intelligence (AI) will be an especially powerful difference maker, not only in the practice of radiology but also in how healthcare organizations and their caregivers consume, measure and take action. AI offers healthcare the potential to reduce clinical variance and errors, find and highlight alternative diagnoses, and unburden physicians from rote tasks.

How so? The digital pixels in imaging studies contain insights and information that can only truly be accessed using advanced analytics. These new insights will drive care plans and influence care decisions in ways that are unavailable today. The results can fill critical care gaps, drive quality and elevate consistency when integrated into an enterprise imaging and analytics strategy.

Adopting analytics will elevate imaging to further monetize its work product, as well as help the service line impact diagnoses and outcomes on an unprecedented level. The use of AI in healthcare has been aptly likened to the advent of the 21st century microscope.<sup>2</sup> Just as the first compound microscope revolutionized medicine with cellular exploration 400 years ago, AI dives into data to uncover patterns, in real time, that could help identify health risks.

Amid the change to value-based care, image data can be working harder to improve patients' health, clinicians' productivity and health enterprises' financial performance. It is a resource health systems already own and continue to amass. Why not get the most out of it?



Data



Distribution of  
ownership of data



Low failover and  
recovery costs



Low

# Proof points for monetizing image data through advanced analytics

A health organization's image data could work harder. Every new imaging study a doctor orders, as well the historical studies already in the archive, can provide a wealth of value above and beyond the initial reason it was performed. With tools that enable automation and allow images to be examined at the discrete pixel level, health care can leverage AI to identify chronic conditions, aid in diagnosis, create clinical efficiencies and better characterize patients or a patient for optimal billing.

## Improve early detection and chronic care management in at-risk populations

Every study performed is justified by a primary reason for diagnosis. Many of these studies can also be used to detect the earliest signs of chronic diseases, such as osteoporosis, diabetic retinopathy or coronary artery disease. Today, however, the clinical development of such conditions can often go undetected due to a number of possible causes, including a lack of knowledge, the time it takes to manually perform measurements or a judgment call. But when AI provides a second set of eyes, the study becomes an asset to population health and value-based care initiatives that seek to identify patients with early or low risk of these diseases. With appropriate clinical follow-up, the findings can be evaluated to prevent patients from moving into higher risk categories where treatment is more difficult and more expensive.

## Leverage incidental findings with fewer false positives

Incidental findings have traditionally been difficult to address and manage in the downstream care plan. Often trapped in a static radiology report, these findings could be easily missed in the ongoing treatment of patients. Although there are documented concerns about the number of false positives from incidental findings, the application of advanced analytics brings quality and consistency to these previously reader-dependent findings. Using analytics would more consistently drive actionable insights derived from the incidental findings of a CT or MRI scan to caregivers.

## Enable value-based coding for risk-sharing accelerators

Depending on a health system's reimbursement model, the identification of a validated comorbidity can be cause to change a patient's risk profile and the reimbursement structure for preventative and interventional services. In a fee-for-service setting, patients can be directed to appropriate follow-up procedures. In at-risk models that emphasize preventative care programs to avoid medical events, early identification of conditions can be a direct financial benefit to the health system as well as the patient.

## Qualify for accelerated reporting measures

Using AI tools to achieve quality measures gives health organizations an opportunity to qualify for accelerated payments under the Centers for Medicare and Medicaid Services (CMS) Merit-based Incentive Program System (MIPS). A continuous stream of additional guidance has been released on the key measure changes affecting clinical practices and departments, such as radiology, that plan to report incidental findings to qualify as a quality measure under MIPS. Coding staff and clinical leaders must be certain they are reporting quality measures using the latest CMS specifications guidance. Eligible clinicians billing Medicare Part B have until March 31, 2018, to submit new quality reporting structures within MIPS for the 2017 performance year.

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## The AI-enabled radiology and imaging department

Automates incidental findings that require extensive computation and measurements

Removes repetitive, mundane tasks from radiologists so they can focus on image interpretation

Improves the accuracy and consistency of reports, which benefits downstream providers

Prioritizes critical, time-sensitive cases on the radiologist's worklist

Proactively highlights abnormalities to reduce the possibility of them being overlooked

## Empower clinicians to practice at the top of their license

The human brain can't do it all. When integrated into provider workflows, analytics act as a second set of eyes, assist physicians by compiling relevant historical data, or even provide information on differential diagnoses. Analytics frees up clinicians to work on higher cognitive patient care tasks, ultimately enhancing their work and reducing variance across care teams, both of which directly impact the safety and quality of outcomes.

## Attract more imaging referrals

During this "do more with less" era, imaging departments may be combatting the risk of patients being forced by their payers to choose the imaging services provided by the lowest bidder. Advanced analytics is not only a necessity but also an opportunity, because it enables radiology practices to both manage higher volumes of throughput and differentiate its services by adding value to the interpretation. In the near future it is not difficult to imagine that every medical imaging study will first pass through advanced analytics before being reviewed by a diagnostician. This will help drive efficiency and attention by prioritizing the image interpretations of radiologists to the urgent and critical cases first.



# Focus on data to ensure the enterprise imaging infrastructure is ready for AI

## Common inhibitors to leveraging images for data-driven initiatives

The push and pull from vendors has put a spotlight on AI. However, for a variety of reasons, most organizations haven't prioritized — or aren't yet ready to adopt — AI in medical imaging. Investments often begin with enterprise imaging, which addresses image acquisition across care areas, image transport and image storage. The technology stack typically includes multiple clinical silos with a common repository on the back end acting as a vendor-neutral archive. Early adopters of enterprise imaging are looking for additional components that use a "universal viewer" for clinical electronic medical record integration, while more advanced imaging users want an enterprise worklist. As a health system's enterprise strategy advances, imaging analytics that examines pixel data will prove to be the true jewel among return on investment (ROI) objectives and opportunities.

The road to enterprise imaging and analytics may be paved with gold, but the first few miles definitely are not. Vendors are primarily responsible for the volume of digital data. They have created this data to suit their own workflow and application needs, and do not want other applications to leverage it. As a result, before committing to any action, a health organization must assess the state of its data to realize previously untapped benefits.

## A vendor-neutral analytics layer liberates insights from the image archive

The past decade of technology investments has established a solid foundation within imaging, a discipline that is now poised for revolution. Organizations should consider including analytics in their imaging infrastructure to realize the revenue sources described above. The approach to analytics adoption should focus not on the impact to individual clinicians or departments, but instead emphasize the enterprise as a whole and patient care across it.

With the adoption of analytics as a core component in an overall enterprise imaging strategy, the valuable data source that can begin with radiology becomes the key to unlocking outcome insights that were previously locked in an archive. Historically, investment strategies have centered around vendor neutrality. It is important — if not critical — to take this same approach when adopting analytics. There are, and will be, considerably more vendors offering insightful and clever ways to integrate and analyze clinical data sources, including imaging. Thus, health organizations must look at how analytics adoption can leverage a neutral analytics platform as opposed to having multiple platforms that must be subsequently integrated with multiple user interfaces.

## Applying advanced analytics to imaging impacts the entire health system

Mark Michalski, M.D., executive director of the Center for Clinical Data Science at Massachusetts General Hospital and Brigham & Women's Hospital, says radiology is not the only department thinking about how to leverage AI. "Practically everyone is talking about this. We are having similar discussions with pathology, radiation oncology, cardiology and neurology. In fact, every '-ology' is having this same discussion. It just so happens that radiology is once again at the forefront of a technology revolution."<sup>3</sup>



The insights generated from a health organization's image data must become part of the primary workflow of its caregivers, who can then use this information to make patient care decisions. This integration must go beyond simply using dashboards and creating reports. To truly impact health outcomes, data about incidental or suspected findings as well as differential diagnoses must be integrated into the applications used at the point of care so physicians can use this information to initiate an appropriate intervention. The end goal is to enable clinical decision support and workflow enhancements to help physicians provide higher quality care.

With enterprise imaging analytics, multidisciplinary groups can work together to prioritize the disease states most in need of early intervention and testing, as well as create and validate care pathways that leverage insights from image data. Used in this way, imaging analytics creates an opportunity to make a meaningful pivot toward practicing preventative, as opposed to reactive, medicine that has an impact on total cost of care, morbidity and mortality.

## Functional capabilities of enterprise analytics

Annotate image data sets so algorithms can be applied to them

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Create tools that provide physicians with probability-driven differential diagnoses

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Mine image data and reports for insights to use in population health initiatives

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Analyze historical cases to reduce error rates

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Advance AI through anonymized data sets to validate emerging AI tools

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