Achieve Big Picture Intelligence Through Data Convergence

4 ways to leverage imaging data and clinical knowledge to drive transformative results

The Benefits of 'Big Picture' Intelligence

Healthcare organizations today share three common objectives: (1) providing higher quality and more efficient care, (2) reducing the cost of care delivery, and (3) optimizing reimbursement potential and return-on-investment (ROI) for clinical, technical, and operational initiatives.

The challenge, however, is that no one department or person has overarching responsibility for all three objectives. CFOs, CMOs, radiology department administration, and operations specialists all look through slightly different lenses when analyzing data

and measuring key performance indicators (KPIs), which results in a fragmented view of an organization's overall performance – no one is looking at the 'big picture'. This means that these three objectives will never be achieved without a more unified approach to data analytics across the entire enterprise. By structuring data within and beyond radiology, a new and significant breadth and depth of understanding can be achieved that has never before been possible.

Due to the growing requirements for real-time data in medical imaging, Bialogics and

emtelligent have partnered to deliver a complete clinical and business intelligence platform. This platform integrates Bialogics' DImax AI-Ready Business Intelligence Platform, a vendor agnostic and fully interoperable data analysis engine that captures data flowing from multiple information silos in all protocols to provide radiology departments with rich and actionable insights for maximizing operational efficiency and effectiveness, with emtelligent's emtelliPro™ Natural Language Processing (NLP) engine, a highly scalable and accurate solution that extracts structured data from the unstructured text of medical documents like radiology, pathology, and clinical reports to enable analysis of cross-functional, multi-disciplinary data from all corners of the healthcare organization.

This convergence of clinical and business data provides a new level of 'big picture' intelligence that enables the achievement of the three aforementioned objectives by:

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

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

3. Expanding and automating quality-based reporting to increase reimbursement revenue and ROI.

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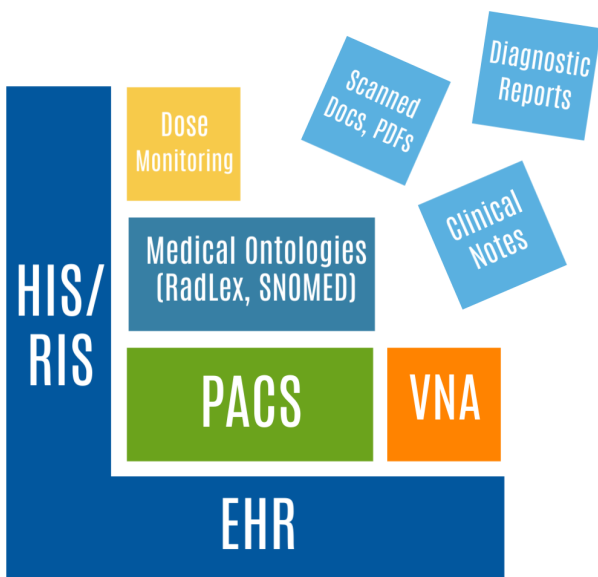

Bialogics and emtelliPro™'s powerful analytics and NLP engines identify medical terms according to standard ontologies and recognize abbreviations, colloquialisms, assertions, and relationships to uncover insights hidden within unstructured narrative text and combine them with structured imaging data points to produce a complete picture of patient care.

Automating & Monitoring Follow-Up Adherence

Between 8 – 15% 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% 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 but not limited to failure to appropriately communicate finding recommendations to patients and/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 (e.g. before the patient leaves the care facility).
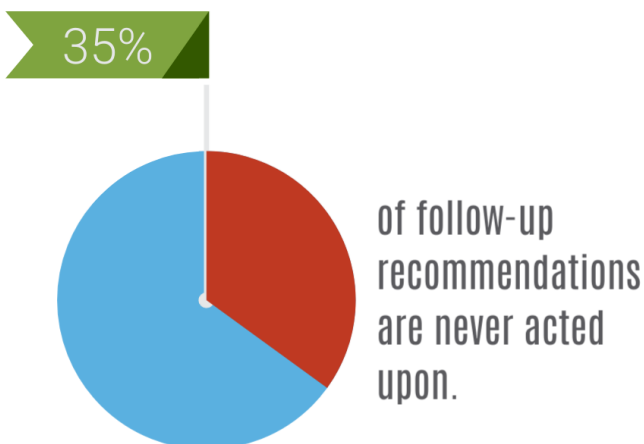
Missed follow-up recommendations carry two significant consequences for both care providers and patients. Most concerning, missed follow-ups introduce the opportunity for clinical and medicolegal risk should a malignant disease progress unnoticed. As well, this results in lost revenue opportunities when exams are not performed at all or are performed at an outside hospital or clinic.

▼80%

of healthcare data is unstructured.

Adding further complications, 80% of healthcare data is unstructured and the rest is often locked in information silos with proprietary data schemas and varying degrees of interoperability. Therefore, manual cross-referencing of requisitions and radiology reports was typically required to ensure appropriate indications were followed and ensure that appropriate follow-up recommendations are being communicated, scheduled, and performed, which is a highly labour-intensive and costly manual process – until now.

DImax with emtelliPro provides a fully automated platform to identify and report

35%

of follow-up recommendations are never acted upon.

upon the follow-up recommendations that exist within the narrative text of traditional radiology reports, significantly reducing the administrative burden of manual report review, maximizing reimbursements, and improving compliance to minimize refused claims.

DATE	PATIENT ID	DOCUMENT TYPE	SENTENCE	REASON	PROCEDURE	TIMEFRAME
2018-07-30	12345	Radiology: CT	3. Peripheral focal area of airspace disease in the left upper lobe along with two nodules in the left upper lobe and left lung apex which could be a sequela of prior infection; however, a followup examination in four weeks by a chest CT scan examination is recommended.	disease, infection, nodules	scan	four weeks

The emtelliPro™ follow-up detector provides a user-friendly interface to search, track, and report upon follow-up recommendations, including relevant clinical context from the diagnostic report, across clinical departments and specialties.

Improving Operational Awareness & Insights

Patients are undergoing more medical imaging studies than ever before, and technological advancements are continuously increasing the volume and veracity of data that is produced with each care encounter. Business intelligence platforms that can effectively and efficiently capture, correlate, and analyze these data points play an integral role in improving the patient care experience as well as reducing overhead costs associated with care delivery by uncovering evidence-based insights into workflow processes and bottlenecks that can minimize wait times, increase patient throughput, optimize modality utilization, and reduce report turnaround times (TATs).

One of the biggest challenges in achieving this is gaining access to data from assorted imaging and information systems that have varying levels of interoperability across the enterprise. While many systems have achieved some level of technical

interoperability, few are able to assimilate relevant data points across the enterprise or support the ever-increasing volume of data to deliver timely insights and recommendations to the person and place where they can best be acted upon and presented in a way that can be easily accessed and interpreted.

These insights can be accessed through DImax's vendor agnostic, fully-interoperable, and highly scalable business intelligence platform, which captures over 100 relevant KPIs from heterogenous data sources across the enterprise (e.g. EHR, RIS, PACS, VNA, etc.) and delivers actionable insights through easily customized dashboards and automated reports to identify workflow gaps and inefficiencies and quantify improvement opportunities. As well, by adding enhanced clinical analytics to traditional operational views DImax is able to monitor specific indications (e.g. stroke) for adherence to prescribed protocols, indications, and TATs, providing a deeper level of operational understanding that can deliver significant and immediate ROI.

The live DImax dashboard provides dynamic visualization of key performance indicators and workflow statistics across imaging departments.

Maximizing Reimbursement Potential & ROI

Performance-based programs aimed at improving the quality and efficiency of care delivery such as the Merit Based Incentive Payment System (MIPS), Choosing Wisely, and the Protecting Access to Medicare Act (PAMA) have increasing influence on the financial reimbursements and bonuses available to care providers. Now more than ever an organization's financial performance can be directly correlated to its ability to extract comprehensive and meaningful insights from the data

generated within and beyond the radiology department. In order to protect reimbursements and maximize bonus potential healthcare organizations require clinical and business intelligence solutions that are able to traverse disparate facilities, departments, and systems to deliver a unified view of an organization's operations and performance.

MIPS

MIPS calculates financial adjustments to Medicare payments for providers based on scores earned across for categories: quality, promoting interoperability, cost reduction, and continuous improvement activities. Scores exceeding the set performance threshold earn additional payments, whereas scores falling short result in financial penalties.

MIPS Categories & Weights

- Quality — 45%
- Promoting Interoperability — 25%
- Cost — 15%
- Improvement Activities — 15%
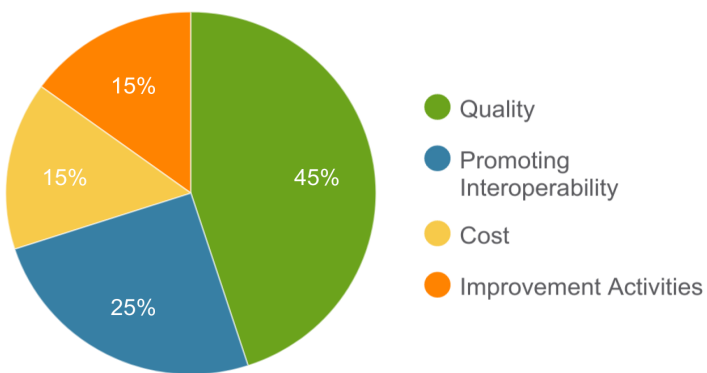
There are more than 250 pre-defined metrics in the quality category alone tracked under MIPS, and additional points are

awarded to organizations that go the extra mile to identify and track additional meaningful quality-based criteria. Reporting upon this volume of metrics is no small task and is further complicated as Centers for Medicare and Medicaid Services (CMS) defined metrics and requirements continue to grow and evolve over time. With DImax

MIPS has defined >250 quality metrics, and more points can be earned for identifying and tracking additional criteria.

with emtelliPro, tracking CMS-defined MIPS measures, and identifying and baselining new measures is easy. By aggregating data points from across the EHR, PACS, and financial systems and leveraging deep analysis technologies to extract hidden insights DImax is able to present real-time progress statistics and automate the reporting process to maximize MIPS scores and associated performance payments.

Choosing Wisely & PAMA

Choosing Wisely is a global movement that began in the US through the American Board of Internal Medicine (ABIM) and now spans 20 countries worldwide. It is focused on developing a list of multi-disciplinary best practices and recommendations for evidence-based clinical decision making to ultimately reduce the number of unnecessary or

duplicate tests, treatments, and procedures and promote increased communication and collaboration between care providers and their patients. This initiative goes hand-in-hand with upcoming PAMA legislation that, beginning in January of 2021, will require referring providers to consult appropriate use criteria (AUC) when ordering advanced diagnostic procedures, or risk financial losses due to denied reimbursements.

Optimizing your organization to align with, or even contribute to the definition of industry best-practices calls for a deep understanding of your current referral patterns, ordering practices, and clinical protocols. Achieving this requires a thorough analysis of both structured and unstructured data from across clinical service lines, which again if done manually would be an insurmountable task. DImax traverses clinical departments and information repositories to derive cross-
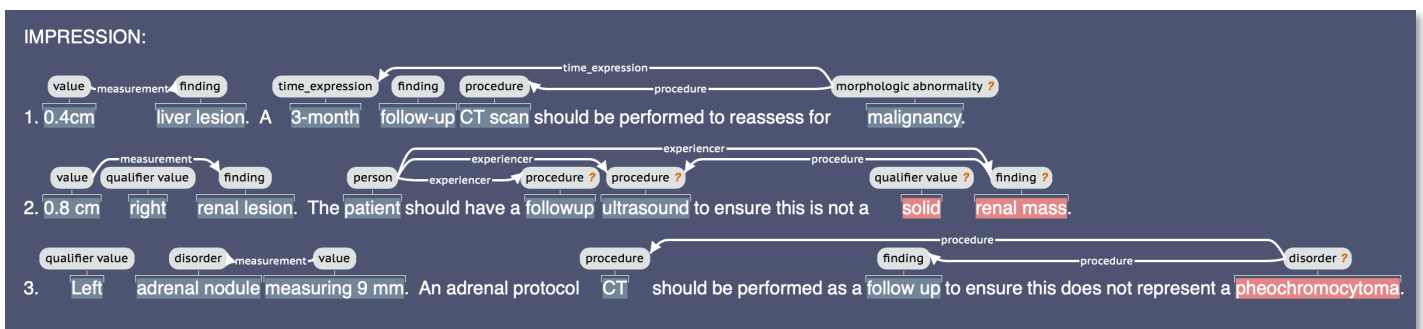
TODAY THERE ARE MORE THAN

600

RECOMMENDATIONS DEFINED ACROSS

>36 CLINICAL SPECIALTIES

functional, multi-disciplinary insights that can immediately escalate areas where significant waste or risk exist and monitor trends over time to identify and quantify opportunities for optimization, allowing healthcare organizations to realize immediate ROI by reducing costs, and better positions them to protect future reimbursements by correcting ordering inefficiencies before penalties are imposed.

IMPRESSION:

1. 0.4cm liver lesion. A 3-month follow-up CT scan should be performed to reassess for malignancy.

2. 0.8 cm right renal lesion. The patient should have a followup ultrasound to ensure this is not a solid renal mass.

3. Left adrenal nodule measuring 9 mm. An adrenal protocol CT should be performed as a follow up to ensure this does not represent a pheochromocytoma.

emtelliPro's powerful NLP engine supports quality-based reporting by identifying and categorizing clinical procedures, findings, diagnoses, and follow-up data from within unstructured report content.

Curating Clinical & Technical Data to Inform AI & ML Applications

Artificial intelligence (AI) and machine learning (ML) are increasingly contributing to the healthcare landscape by enabling highly accurate analysis and interpretation of massive volumes of heterogeneous data in real-time, a feat that would not otherwise be possible – even if performed by an army of human data analysts.

Such insights have huge potential to significantly impact the quality, efficiency, and cost of care delivery by providing evidence-based recommendations for ordering and treatment protocols, predict demand and utilization patterns to inform staffing and investment decisions,

proactively identify and monitor patients who are at a higher risk for certain diseases or conditions, and profile populations to identify clinical and social trends to help local hospitals and healthcare organizations perform capacity planning and access grants and funding based on the needs of their patient communities.

AI and ML require vast amounts of data from which to glean insights and form decisions, and good decisions need data that is correct, reusable, and meets the unique business, clinical, and data modeling and analysis requirements of each healthcare organization and AI/ML

technology – none of which are possible if data is incomplete, inconsistent, or siloed.

Unfortunately, most data-gathering systems in the healthcare universe today suffer from a variety of limitations such as insufficient integration points, rigid data models, and an inability to interpret unstructured content – which represents 80% of healthcare data. Because of these limitations a significant amount of clinical context is often lost, and centralization and standardization of the data that's left is often required. This ultimately results in expensive, time consuming, and risky migration projects that are often too cost-prohibitive for most organizations to undertake.

Together DImax with emtelliPro can process structured and unstructured data from EHRs, medical imaging systems, and business systems in real-time to create a

> *"As a radiologist, I understand the immense value that Bialogics' analytics platform brings to medical imaging departments, and with the clinical insights that can now be obtained with emtelliPro we can work together to bring even greater improvements to patient care."*
>
> *– Dr. Tim O'Connell, Emergency/ Trauma Radiologist, CEO emtelligent*

tremendous structured database of clean, complete, and accurate data that can be leveraged to train or run AI and ML applications, or be re-structured and re-purposed to deliver varied insights to stakeholders across the enterprise – within and beyond radiology.

Getting a Clear View of Your Big 'Picture'

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 to 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.

Together Bialogics and emtelligent deliver a comprehensive clinical and business

intelligence platform that can unlock the data hidden within disparate systems, data silos, and unstructured content to deliver a fully unified and complete picture of clinical and business operations – within and beyond radiology. Whether you're a private clinic, a large hospital system, or an Accountable Care Organization (ACO), it is imperative that you start your data collection efforts today to improve patient care through improved tracking and management of follow-up recommendations, reduce TAT and cost by

driving continuous operational improvement initiatives, maximize reimbursement potential and ROI by expanding and automating quality-based reporting, and prepare your organization for future AI/ML applications and use cases.

Why wait? DImax and emtelliPro can be quickly and easily integrated into your existing infrastructure so you can start realizing an immediate return on your investment by unlocking the value of your organization's most strategic asset – your data!

Big Picture Intelligence

Optimize Operations & Reduce Cost

Elevate your awareness of imaging operations to drive continuous clinical and workflow improvement across the organization.

Increase Reimbursement Potential & ROI

Expand and automate quality-based reporting (MIPS, Choose Wisely, PAMA) to increase reimbursement revenue and ROI.

Improve the Quality, Efficiency, and Cost of Patient Care

Proactively identify, monitor, and report upon follow-up recommendations and incidental findings to improve clinical outcomes.

Curate data for AI and ML to gain 'big picture' insights that stratify risk and identify trends for patients and populations.

About Bialogics

Bialogics' AI-Ready Business Intelligence (BI) Platform has been developed in collaboration with healthcare clients and business partners to provide fully interoperable and innovative data transformation and analysis solutions that support the emerging data management needs of Artificial Intelligence (AI) and Machine Learning (ML) technologies. A platform for Medical Imaging Administrators and Physicians, Bialogics incorporates a comprehensive toolset to measure and improve access to diagnostic imaging data, providing in-depth analysis of procedural appropriateness, performance management, and operational cost and efficiencies. Its vendor agnostic, flexible, and highly-scalable platform serves as a foundation for the integration of third-party applications that require accurate and reusable data to power multiple evidence-driven imaging and business use cases across the enterprise.

Bialogics is a licensed partner of emtelligent Inc. and PresiNET Systems.

Contact Us

For more information on DImax, our AI Ready Business Intelligence Platform, emtelliPro™, our Natural Language Processing Clinical Intelligence engine, and IDEA Integrated Data Engine for Analytics, visit our website at www.bialogics.com or to arrange a demonstration connect with us through email at info@bialogics.com.