WP

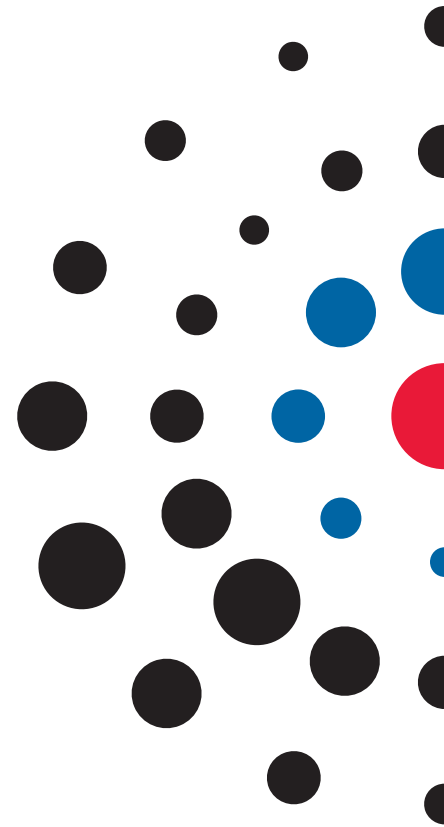# νRad Analytics Continuum Helps Clients See Inside Their Data^{SM}

How Radiology Groups and Hospitals Use Data-Driven Insight to Demonstrate Strategic Value

ν**Rad**®

Analytics are changing the field of radiology, replacing opinions with hard facts

Radiology data and analytics are no longer an option; they are a requirement and a starting point that radiology must embrace to define itself as a partner providing innovative insight into clinical and operational performance vs. a cost center to be managed.

In our new healthcare world, you won't get paid for quality and value if you can't prove them, and you can't prove them if you don't measure them.

Why now?

As outlined in the vRad White Paper, "Becoming Indispensable to Your Imaging Partners," value-based care is a major trend driving the U.S. healthcare system today; volume-based care is being replaced. That means imaging departments and private or hospital-based radiology groups will need to measure performance like never before. Demonstrating value means quantifying and benchmarking performance metrics including (but definitely not limited to) accuracy, quality, clinical outcomes, utilization, staff productivity and Relative Value Units (RVUs)—all of which require normalized data and analytics tools to convert radiology data into information . . . and information into actionable insight.

The stakes have increased with declining reimbursements

Since radiology reimbursement has declined 25 percent over the last five years*, working harder for less compensation has increasingly become the norm. However, this is neither sustainable nor is it a long-term solution. Radiology must improve its operational efficiency while maintaining high-quality patient care. It must also increase its strategic relevance in the healthcare ecosystem by becoming a better partner to stabilize and mitigate the effects of this reimbursement decline.

The vRad Analytics Continuum—An Overview of Client Reports for Fact-Based Insight

Leveraging vRad's patent-pending data normalization solution and the industry's largest clinical data warehouse of imaging studies, its complimentary reports provide radiology, hospital and health system clients the insight needed into their overall clinical and operational performance.

- Radiology Patient Care (RPC^{SM}) Indices

- Teleradiology Metrics Reports

- Global Practice Information Reports

- Hospital Insight Reports

- Custom Advisory Reports

Real Case Studies with Real Client Impact

This White Paper will explain – and demonstrate how vRad Analytics helped clients to:

- identify an untapped opportunity to expand women's imaging,

- leverage peer benchmarks to reduce MRI volume from the ED,

- improve service line performance by identifying facility-level best practices,

- support capital investment decisions by quantifying CT Scanner ROI, and

- increase ultrasound program productivity and patient satisfaction.

The Challenge and Importance of Getting It Right

No two hospitals are alike. Each has its own way of doing things, which may (or may not) be standardized even across a single institution.

Disparate systems

There are a myriad of health information systems (be it PACS, RIS, EHRs, Scheduling/Billing Systems) in a hospital—none specifically designed to provide insight demanded by this new changing healthcare environment.

"Having key clinical data from all points of care has been a challenge for decades and the speed of future clinical improvements will depend on our ability to aggregate data from disparate clinical systems."

Boyd Vindell Washington, MD, MHCM
President, Franciscan Medical Group, Chief Medical Information Officer, Franciscan Missionaries of Our Lady Health System in Testimony before the U.S. Senate Committee on Health, Education, Labor and Pensions

Data normalization is not the norm, yet

Normalizing data, as it pertains to healthcare, is a process that takes into consideration local anomalies and variances and correlates them to one accepted and understood "gold standard." Analyzing and comparing data from multiple hospitals and other healthcare facilities requires that the data be in the same "dialect" of radiology language in order to aggregate and define metrics.

For example, one hospital's "ultrasound gallbladder," is another hospital's "ultrasound right upper quadrant" or "ultrasound liver." Descriptions that facilitate the protocoling process are not standard across practices, even if they are all part of the same integrated delivery network with a common EMR.

Normalizing data is therefore a manual, tedious exercise due to variability in description and nomenclature. Data normalization is at the core of making radiology analytics a reality and

insight possible. It is the required vital first step to develop the granularity and flexibility needed for index creation and metrics comparisons. Yet, it is one of the largest challenges facing radiology today.

> *"Analytics for practice comparisons are largely subjective, and in many cases unavailable because of the challenge of comparing disparate data between healthcare facilities. Using a normalized data set … presents a potential opportunity for radiology to take control of the dialogue around quality as it moves from a fee-for-volume to a fee-for-value world."*
>
> Ingrid Lund, The Advisory Board Company

Normalized Data Process a Watershed Moment for vRad

In 2013, vRad began looking to draw meaningful comparisons and gain insight across its 2,100+ client facilities (radiology practices and hospitals) in order to improve vRad's clinical practice and accountability to its clients. Off-the-shelf solutions to help normalize data and measure imaging value were at best, subjective, and at worst, nonexistent.

vCoder: vRad's "Rosetta Stone" for radiology data

Since there was no meaningful solution available to help normalize data to benchmark and find trends in its ever-growing data warehouse, vRad developed the patent-pending vCoder, which became the industry's first data-normalization tool used on inputs for any hospital or radiology group.

Think of vCoder as the Rosetta Stone for radiology data because it helps "translate" many different designations for the same examination and normalizes them down to one standard term, based on CPT codes. Only consistent and normalized data across (and within) facilities allow for fact-based decisions to improve practice management and patient care.
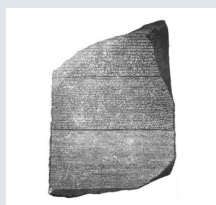
The Rosetta Stone contains the same message—a royal decree by King Ptolemy V—written in three different languages, some of which were known at the time of its discovery. It was vital to deciphering Egyptian hieroglyphs, as it contained the same text in three translations: hieroglyphic, demotic (another form of Egyptian writing) and classical Greek.

With vCoder, vRad was able to develop analytics tools necessary to manage its own clinical, financial and operational practices. It also allowed data from client facilities to "speak the same language" so that metrics could be established and objective comparisons made (i.e., benchmarking). For example, with a normalized national data set like vRad's, radiology groups and hospital imaging departments can now compare their own use of imaging—even to relevant peer groups. To meet radiology's need for value-based practice and performance

transparency, vRad developed a portfolio of analytics tools and reporting solutions that let clients "See Inside Their Data℠" by providing custom views into vRad's anonymized database of imaging studies.

A Continuum of Insight

vRad Analytics is relevant for both hospitals, who must better manage costs and improve operating efficiencies, and radiology groups, who must demonstrate value in a challenging healthcare environment. vRad Analytics provides clients insight to efficiently manage and benchmark their radiology service lines and practices.

Below is an overview of the complimentary reports vRad provides its radiology, hospital and health system clients that allow them to gain insight into their overall clinical and operational performance.

- Radiology Patient Care (RPC℠) Indices: *Benchmarks for all imaging professionals. The first findings-based national benchmarking metrics for the use of radiology imaging.* Launched in November 2013 and derived from normalized and anonymized data in vRad's radiology clinical database of imaging studies from 2,100+ facilities in 50 states, the RPC Indices are a "living library" of statistically significant metrics that provide hospitals, radiology groups and health systems with objective comparisons of their use of imaging to national averages and relevant peer groups. The RPC Indices focus on CTs in the ED, given their operational and clinical relevance. The indices are free and available for unrestricted access by hospitals, health systems, radiology groups and researchers. Interactive infographics can be found at analytics.vrad.com.

Economic Value (RVU Yield): Example of an interactive infographic available in the RPC Indices.
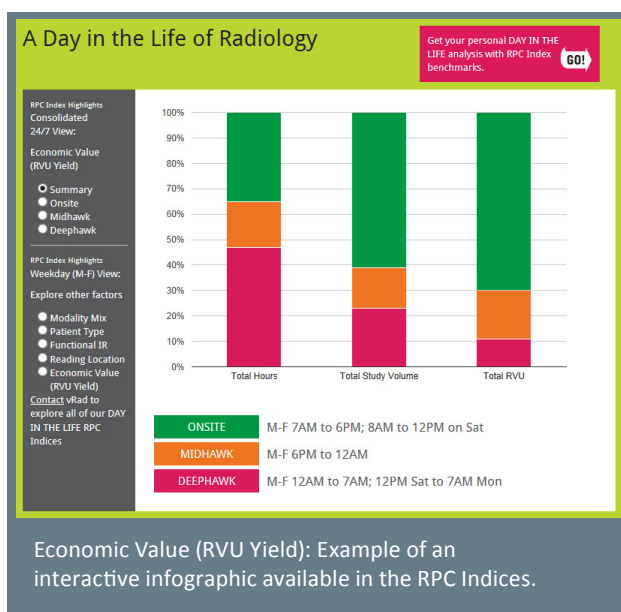
- *Teleradiology Metrics Report (TMR): For All vRad Teleradiology Clients*
  The TMR provides standardized performance metrics to help clients gain insight into important teleradiology services by including a year-to-date monthly rolling snapshot of the teleradiology studies vRad has read for each facility. The report is automatically delivered monthly via email and includes the following facility-level key metrics:
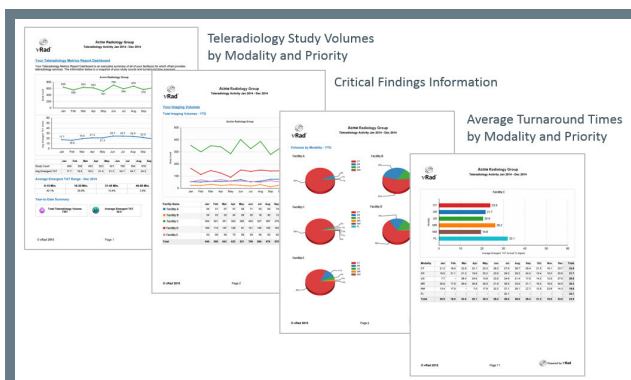
Example pages from vRad's monthly Teleradiology Metrics Report.

- Total imaging volumes

- Imaging volumes by modality and study priority type

- Average turnaround times (TAT)

- TAT details by modality and study priority type

- Critical findings information: reviewing monthly critical findings

- *Global Practice Information (GPI℠) Report: For All Radiology Group Clients*
  The GPI Report is the first all-in-one analytics tool with the ability to help clients become indispensable partners to the facilities they serve. The GPI Report provides a 24/7 look inside finals clients' radiology practices, facility- and modality-specific details, subspecialty segmentation, and other metrics for effective overall practice management. Along with including information not easily obtained from an existing RIS or EMR, the GPI Report helps radiology groups and healthcare facilities objectively review their own Imaging Service Line to improve scheduling, department throughput, utilization and cost management while contributing to an improved patient experience.

As a complimentary management tool for clients partnering with vRad on final interpretations, the GPI Report provides a custom view into vRad's radiology clinical database, as well as a practice's summary and facility-level information. The report is automatically delivered monthly via email and includes all of the data contained in the TMR, along with the following key metrics:

Radiologist Productivity: One example of many metrics tracked in the vRad GPI Report.

- Individual on-site radiologist productivity (reading volume and relative value units by modality)

- 24/7 individual and comprehensive facility metrics such as volumes by modality, day of week and time of day

- Hourly study throughput

- Patient class mix by shift

- Referral patterns

- Results outcomes: Percentage of positive findings by referring physician and radiologist

- Individual referring physician volumes by modality

• *Hospital Insight Report (HIR): Tailored for Hospitals and Health Systems*
  In addition to providing hospital and health system clients similar information contained in the GPI Report, the HIR provides a year-to-date monthly rolling snapshot of comprehensive analytics specifically focused on their radiology service lines. The HIR includes:

Imaging Volume and RVU Activity: Example of the system-wide data included in the vRad Hospital Insight Report.
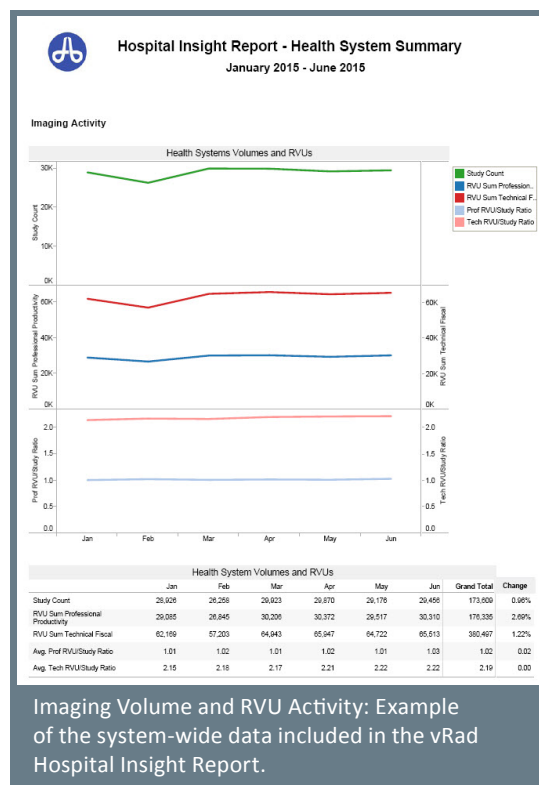
- A facility summary, which provides data on each individual hospital, including study counts, RVU/study ratios (averages of professional and technical), volumes by modality, top ER/outpatient/inpatient procedures, and detailed IR and mammography information, among others.

- A health-system-level HIR provides a comprehensive system summary along with facility-level information from each hospital, clinic or imaging center associated with the system. It also includes percentage change in volumes and RVUs over the prior month.

• *Custom Advisory Reporting: For Growth-Minded Partners*
  Along with the continuum of analytics reports outlined above, vRad will partner with clients to design custom reports and analyses to facilitate radiology service line development, operational planning, process improvement, utilization management and staffing strategies.

vRad's future report offerings will allow clients to access real-time data analytics via an online portal, allowing for new levels of instant access and insight.

Normalized Data Leads to Better Information, Insight, Action …
Demonstrated Value

The move to a data-centric focus in radiology is a natural evolution given its highly digital nature. For example, vRad alone will interpret nearly 6 million imaging studies in 2015 and move over 1.5 billion digital images across its operational platform.

As industries evolve, it is natural for them to migrate away from manual operations to more automated and sophisticated processes. As new technology and new industry initiatives arise, more data becomes accessible to inform and drive innovation. A key example is healthcare's transition to ICD-10. vRad will leverage its vCoder set of standard procedures as the foundation to normalize report meta-data across 2,100+ healthcare facilities and millions of imaging reports. Codifying this information and integrating it into vRad's data warehouse will enable clients to improve their analytics capabilities, including quality measurement and medical error reduction, patient outcome reporting, radiology service line measurement, claims processing and reimbursement improvements, to name a few.

"Replacing ICD-9-CM with ICD-10-CM and ICD-10-PCS will provide higher-quality information for measuring healthcare service quality, safety, and efficacy. Today's data needs are dramatically different than they were 30 years ago when ICD-9 was introduced. ICD-10-CM and -PCS offer greater detail and increased ability to accommodate new technologies and procedures. The codes have the potential to provide better data for evaluating and improving the quality of patient care. For example, data captured by the code sets could be used in more meaningful ways to better understand complications, design clinically robust algorithms, and track care outcomes."

Sue Bowman, director of coding policy and compliance, AHIMA

The next section illustrates examples of vRad's Analytics Continuum positively impacting clients' clinical outcomes and operational decision making—and elevating their dialogue with hospital partners by using fact-based insight.

vRad Client Successes: Case Studies

Case Study #1: *RPC Indices - Finding the Right Resource*

One vRad hospital client wanted assistance regarding a request from a physician group to add another full-time CAQ Interventional Radiologist. This hospital system had a large Medicaid population and was reliant on the state for funding; however, it also had a prospering oncology center. As a result, any and all requests from oncologists were taken seriously. The hospital administration believed they needed increased access to higher-end interventional radiology work based on the narrative being delivered by the referring clinicians.

vRad and the on-site radiology group reviewed and compared the hospital's normalized radiology data against the RPC Indices. It was the first time the hospital could see "inside their data" and across their facilities, including functional IR volumes, patient-to-procedure ratios, stack ranking of referring physician orders and how often it yielded positive findings, and other quality performance metrics. These analyses had been unavailable because the hospital lacked a method to convert billing data into actionable insight, let alone normalize data and benchmark performance against peer groups.

The desire for an additional IR was unsubstantiated when they reviewed the analytics. However, while data showed that there was not enough volume and RVU value to support another proceduralist, the analytics did reveal that the hospital should invest further in women's imaging. The analysis uncovered that women's imaging was only at the fifth percentile of the national average for the hospital's peer group. This was an unexpected outcome given their patient and market demographics, which showed that they had the female population base to support a higher level of mammogram activity.

Armed with this information, the hospital was able to effectively leverage the relationship with the referring physicians to seek out a specific type of colleague: one who could support the growth area of women's imaging, while providing additional light IR capabilities as required. The physicians had actionable insight from their data that encouraged an unemotional, fact-based discussion. This type of value-added service will be what separates radiology groups from being seen as vendors vs. strategic clinical partners.

Case Study #2: *"When MRI Volume Isn't Good Volume"*

A hospital client saw a significant number of MRIs being ordered out of the ED, even though MRI is generally not an emergency study type. Trying to approach a physician about ordering patterns is often an uncomfortable conversation, especially if it is a non-physician administrator approaching them about a clinical matter.

By using analytics tools, the team was able to isolate two ED physicians whose MRI-study ordering patterns were well above benchmarks established by other physicians at the hospital—as well as by the hospital's relevant peer group. The analysis permitted the hospital to go back to the ED physicians with hard facts. The radiologists were confident there was

no viable clinical reason for conducting these studies and could discuss such a charged topic without apprehension. There was no volatility with respect to openly discussing physician ordering patterns because the emotion had been removed by using evidence-based analytics. What was a potentially complex issue was defused.

Furthermore, referring physicians were appreciative of the team's retrospective approach. Rather than changing ordering criteria and clinical care "in the moment" for all referring physicians, the group used insight-driven radiology analytics retrospectively to identify and address the few outliers in a manner that did not require every referring physician to change behavior. Moving forward, the hospital is using analytics to assess whether corrective action has had the intended effect on ordering patterns, outcomes and future performance against peer groups.

Case Study #3: *Teleradiology Metrics Report - Helps Practice with Hospital Partners*

With three locations in and around Bloomington, Ill., Bloomington Radiology provides services to three hospitals and two imaging centers, and maintains a significant level of outside business through its private office. Practice Administrator William S. Wilson noted that their monthly Teleradiology Metrics Reports (TMR) have been a robust source of detailed information on their clinical operations. Furthermore, it is easier to digest, understand and share with his radiologists and hospitals partners, when appropriate.

"The data and graphs provide a much clearer picture of what is happening in our practice," he said. "Previously, with the spreadsheets we had prior to the TMR, we lacked insight given that data was only monthly imaging volumes by location. Now we have total imaging volumes by location, as well as by modality and priority, average TATs by modality and priority, and critical findings information. This specific data is helpful in many ways. It helps us with staffing and resource planning. It also helps us educate our facilities about issues that may arise in terms of utilization. They see us with this data and know that we are being proactive and strategic in our thinking and approach to problem-solving."

He noted one issue where the practice was able to show data from one hospital that had a higher level of "stat" exams (nearly 50 percent of their volume), which was an outlier when compared with other hospitals in their monthly reports. "By bringing them this data and having a discussion, we were able to raise an issue about what the data and evidence showed, instead of someone making a sweeping judgment. I find this to be a better approach when looking to affect change and improve processes. It also shows our hospitals that we are being proactive and monitoring issues and that we want to partner and work with them to solve problems. They appreciate this kind of approach."

Wilson believes that the TMR is an effective tool that allows Bloomington Radiology to be seen as a more engaged strategic partner. "This data helps solidify our position on issues and also provides confidence and assurances when we need to have discussions. It provides the needed support for a meaningful discussion that is productive, builds consensus, and can improve how we practice radiology and provide better patient care."

The leadership team at East Texas Medical Center Tyler (ETMC-Tyler), a 464-bed community hospital in Tyler, Texas, needed to answer many questions about whether to invest in a third CT scanner:

- Does CT volume support the capital purchase of a third CT scanner?

- How does the hospital's best practices stack up against other Level I Trauma Centers?

- If an investment is made in a third CT scanner, how soon would the hospital be able to recoup its investment?

Dianne Adelfio, vice president of operations at ETMC-Tyler, realized she needed better data to begin to answer these questions. "We couldn't glean a clear picture of trends among ordering physicians and times that CTs were being ordered, along with peak days and hours of operations," she said. What helped Adelfio and the rest of her team make their decision were analytics tools from vRad because they included the data needed to confidently commit to purchasing the third CT scanner in May 2014 after a four-month discovery process.

With that project successfully completed, Adelfio's team continued to ask new questions in order to drive greater efficiencies and better patient care at the hospital. One area of focus was its ultrasound program. As is the case at most community hospitals, ETMC-Tyler's ultrasound program traditionally ran Monday through Friday, with on-call support during the weekends.

The discovery process included getting "very microscopic" with everything from peak hours to days of operations. To answer their questions, her team needed to determine the hospital's highest volume days and isolate where the greatest staff needs were. The need to mitigate any type of delays in service to patients and their referring physicians was equally important.

With the intelligence gained from vRad's analytics solutions, ETMC-Tyler changed its staffing plan for its ultrasound program. Today, patients can make appointments Monday through Saturday. There are eight additional slots for patient appointments. In addition to providing better and more convenient service to patients, Adelfio points to reduced overtime costs: $30,000 in just the first three months.

ETMC-Tyler's use of vRad Analytics offers access to information to make informed decisions about optimizing staffing, imaging utilization and clinical quality.

Conclusion

Radiology must take more of a leadership role in discussing innovation and providing solutions. It must open up new communication channels and get in front of hospital administration and referring physicians with insight that can be used to make better decisions for the health of patients and the practice of radiology.

Radiology must be shining the light on the use of imaging—and become a credible and welcome partner on operational and clinical decisions to improve efficiency and value to patients and hospital administrators.

And making decisions with imaging analytics—evidence and data—rather than opinions and conjecture will demonstrate how radiology can add strategic value—vs. simply adding costs to a hospital or health system. Seeing inside your data and understanding how your practice operates are only part of the equation. The other is taking the initiative and sharing this insight and work with other partners to affect positive change.

About vRad

vRad (Virtual Radiologic) is a leading outsourced radiology physician services and telemedicine company with over 350 U.S. board-certified and eligible physicians, 75% of whom are subspecialty trained. It is an affiliate of MEDNAX, Inc. (NYSE: MD), a national medical group specializing in neonatal, anesthesia, maternal-fetal, pediatric cardiology and other pediatric physician services.

vRad interprets nearly 6 million patient studies annually—and processes over 1.5 billion images on the world's biggest and most advanced teleradiology PACS—for its 2,100+ client hospital, health system and radiology group facilities. A winner of Frost & Sullivan's Visionary Innovation Award for Medical Imaging Analytics (North America) and a leader in imaging analytics, vRad provides access to the only radiology patient care benchmarking platform (vRad RPC^{SM} Index) with 33.7 million+ normalized imaging studies. vRad's clinical expertise and evidence-based insight help clients make better decisions for the health of their patients and their imaging services. For more information about the company, including vRad's 2014 Frost & Sullivan Best Practices Award, please visit www.vrad.com. For real-time updates, follow us on Twitter (@vRad) or "like" us on Facebook.

"Using analytics to better measure, benchmark and prove overall healthcare value is a complex undertaking. You must know what to measure, how to measure it and what benchmark goals to choose. For example, when tackling issues like imaging appropriateness, you can't compare your data to a critical access hospital with 25 beds in Vermont if you are a Level 1 trauma center in Los Angeles. Radiology analytics demand context if you are going to make better decisions for better alignment with hospital partners around quality, service levels and performance."

Philip Hampton, Vice President, Lovelace Health System, New Mexico