

Clinical Transformation

White Paper

The Power of the Medical Cloud to Drive Smarter Healthcare

Utilizing the Cloud as a unifying platform for imaging and patient data to enable clinical transformation and improved cost/quality outcomes



Executive Summary

The move towards medical homes, **improved care coordination** and **patient-centered care** within developing Accountable Care Organizations (ACOs) requires **new processes and technologies** that leverage all of the data across information systems and care providers to make possible a **new level of collaboration and knowledge-sharing** both within and between evolving healthcare delivery systems. To be successful in presenting medical imaging and other critical information, IT solutions must rely on a **cloud-based clinical archive** that makes providers and their underlying systems providers **ubiquitous** and **foundational** to the central goal of cost-effectively **improving the health** of entire populations.

Healthcare delivery continues to evolve, and how medical information is used and managed must continue to change with it. Today, an increasing number of hospitals, physicians and other providers are considering the benefits of joining forces to create Accountable Care Organizations (ACO). One of the latest emerging trends in care delivery models, ACOs are designed to foster a new level of coordinated patient care for member populations across both affiliated and non-affiliated providers, helping improve clinical outcomes, member satisfaction and the value received from every healthcare dollar spent.

Over recent decades, caregivers have begun to leverage the power of information technology to improve the cost and quality of the services they deliver. Some are realizing that in many ways, they've only begun to scratch the surface of the possibilities — and the strategic imperative — of leveraging that growing body of information.

Nowhere is this more true than in an ACO, where a hospital is extending its traditional "reach" of care services to each patient and to populations of affiliated members. This requires a much closer collaboration across broader groups of people, systems and organizations than ever before, presenting significant challenges to the developing organization. New methods must be deployed to safely, securely, easily and cost-effectively bring all of their operations and their data together to function efficiently and improve outcomes for patients, providers and payers alike.

The Evolution of Medical Care...and Its Data

One of the foundational challenges in bringing together providers and care delivery in general is how medical care has evolved. Historically, care has been provided on an episodic basis...a patient gets sick and goes to their doctor. The doctor, leveraging the tools in his "little black bag" treating the patient's illness and sends them on their way until the next episode of illness or injury. A few lines of medical history are scrawled in a paper record and filed on the shelf until the next problem presents itself.

A number of factors have continued to impact how care is provided. First, we have seen unparalleled **advances in digital diagnostic and**

treatment modalities. Simple x-rays and lab tests have given rise to a wealth of other capabilities to help a patient get and stay well.

As more care is provided to millions more patients — and data is tracked regarding the outcomes of that care — a growing body of best practices has emerged. This valuable **evidence-based care** information is potentially available to each physician and other providers caring for a patient, down to access not just through their home or office computer but on their mobile devices. Caregivers can even do more than access information to support their decision-making; they can use the latest generation of smart mobile devices to take pictures of patient bruises in the office or in a home-health setting, as well as emerging innovations that the last century's doctor with his little black bag couldn't even dream of.

With a population that continues to expand and live longer, lead more active and productive lives, this means an **explosion of data-intensive medical imaging** and associated patient information, captured through these many sources. So the challenge becomes how to bring all of that patient data together, how to store it, and how to present and access it safely and securely, wherever it's needed to support high-quality, cost-effective care.

Finally, both patients and payers alike are demanding **better coordination of their care** between the expanding number of specialists and facilities that provide them with health services. Leveraging the value of evidence-based care and best practices, today we expect our caregivers to do more than help us get better...we expect that proactive measures are taken to help us remain at optimal levels of health and to **prevent medical events from**

occurring. Today, that is how we're beginning to measure true value from our healthcare delivery system, and how payers are increasingly looking to compensate providers based on how healthy they are keeping populations of members.

The graphic demonstrates the transformation of medicine and what it means for data growth, access and utilization.

From today's focus still on episodic care of illness and injury, we're moving to a greater emphasis on information correlation to drive preventive care. As we move right and upwards on the graph, we see a leveraging of information exchange to impact decision support and transform coordinated care delivery. This supports the desired preventive approach to health, rather than medicine...moving into social networks of similar patients, diet and other healthy methods to reduce weight and cholesterol, and other means that fundamentally shift how we get and stay well.

Tying It All Together

But, as always, the challenge lies in coordination. Forward-looking healthcare enterprises acknowledge that within their own organization, their existing information systems don't "talk" well to each other, even with the best efforts of their own staff and a multitude of IT vendors.

Further, the Internet and social media have fundamentally transformed how we expect to access and interact with information. In the case of healthcare, it has put a wealth of medical knowledge directly into the hands of not only the growing number of caregivers, but also to patients...patients who want to — and increasingly are being challenged to — play an expanded role in their continued health and wellness.

Today, comprehensive patient information must be available and accessible securely from anywhere, anytime and by anyone with appropriate permissions and engaged in patient care, permission-based, involved in caring for the patient...at the point of care, to support long-term maintenance and wellness, and anywhere else the care team and a patient are making decisions impacting the patient's health.

Patient-Centric at Last

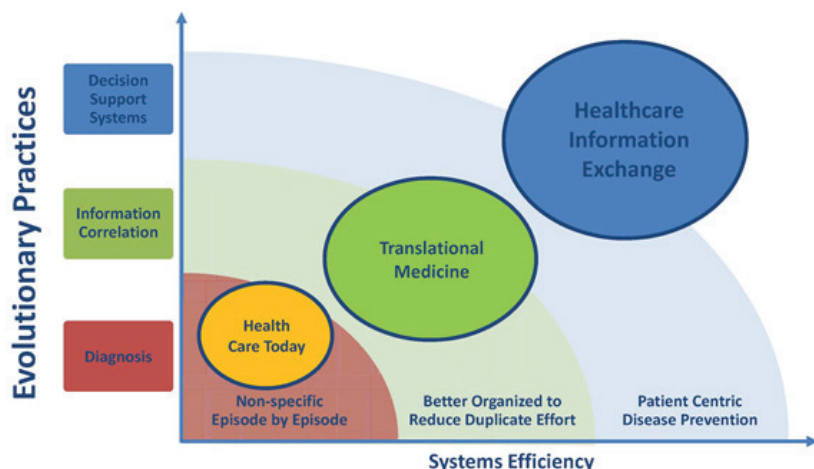
In this complex environment, the healthcare landscape is changing from a caregiver- and hospital-centric model to one that is more distributed and patient-centric, with the patient providing personal data and contributing to the body of health information available for analysis to foster best-practice care over time.

Also, as patients are being expected to be more active participants in their own care — both clinically and financially — they are increasingly acting like what they've really been all along: consumers of medicine. And consumers have a choice of where they acquire healthcare... in this case, which provider organizations they choose to align with.

So as they and their care become even more mobile, tying together patient-focused data across providers — and between providers and their patients — becomes even more critical for positive outcomes. It is also critical to the financial viability and continued success of the developing ACO that is paid to deliver healthy outcomes cost-effectively.

So is data analytics. In the coming era of ACOs, increasing competition and shared risk, it's more mission-critical than ever before to have the ability to gather and report data across patients, providers and information systems to discern cost, utilization and outcome trends and implement evidence-based care and best practices. This requires a data-management architecture that allows easy, flexible and consistent methods of data mining independent of clinical as well as administrative applications and in doing so to create a solid foundation for continued improvement in cost, quality, security and positive outcomes. But how can that be effectively managed, across ever-changing and disparate applications and information technology platforms that often cost millions to install, maintain, and are frequently obsolete by the time they're in use?

Transformation of medicine



A Unified Clinical Archive: Enabling Smarter Healthcare through the Medical Cloud

Providers are learning that there's a better way — a way to tie it all together and free themselves up from the risk of technology obsolescence, interoperability issues and expensive system maintenance and migrations. This represents a shift from worrying so much about the applications and platforms themselves to a simpler and more powerful focus on what they deliver — their data. This requires a tool to make a complex situation simple, adaptable and agile as needs evolve. The tool must be:

- **A solid foundation**, with archives and storage/backups to support the 24/7/365 information access that healthcare requires.
- **Secure**, with audit trails and other methods to ensure that only appropriate persons can access patient data.
- **Agile** enough to allow for easy data migrations as vendors and systems change, and for disparate data views from clinician to clinician and across departments and facilities to meet their unique needs.

- And, of course, it must **integrate** information from a variety of picture archiving and communication systems (PACS), hospital and radiology information systems (HIS/RIS), and digital imaging modalities across departments and organizations in a cohesive, patient-centric view.

Enter the medical cloud

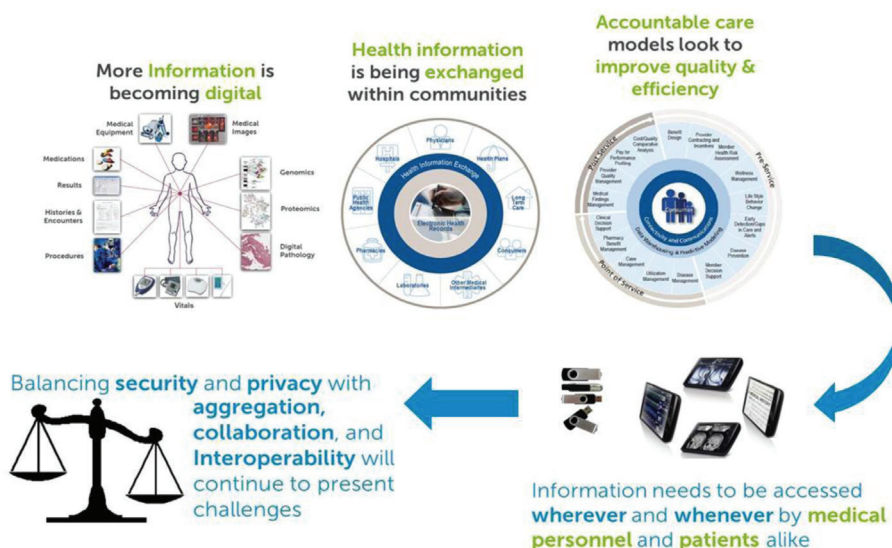
Thanks to the power of the Internet and its open platform, data is migrating beyond the boundaries of our own applications and computer systems. One recent example of a strategic approach to leveraging the power of the Internet to meet this challenge is cloud-based archiving systems such as Dell's **Unified Clinical Archive (UCA)**, an enterprise archiving solution that combines the flexibility of On-Premise and Cloud based archiving. The UCA separates the data management of archived patient data from the various imaging systems themselves and moves it to a secure, web-based storage platform. Harnessing the power and flexibility of the cloud, Dell's UCA gives organizations control of their data independent of their current PACS, RIS or HIS provider, while drastically

simplifying infrastructure management overhead. This makes comprehensive, patient-centered information readily available, while putting an end to costly data migrations and management hassles when systems change, affiliated providers join the ACO and as data volumes continue to expand.

The Dell's UCA solution supports care coordination and reduces the complexity of medical data archiving by providing:

- **One common storage platform** — Maintain one centralized archive of imaging studies and associated reports that can be shared across multiple clinicians, departments and facilities. UCA provides customers with the flexibility of choosing multiple deployment modes to implement a centralized archiving solution.
- **Management of multiple file formats** — Manage Digital Imaging and Communications in Medicine (DICOM), HL7 reports and non-DICOM image files so that, no matter the file format, patient data stays in one place and is easily accessible to the clinician during diagnosis and treatment.
- **Storage on-demand and peer-scaling architecture** — Organizations can scale their information capabilities at their own pace, non-disruptively. Easily add, replace or retire nodes across multiple hardware generations without the manual setup, management complexity and costs of traditional file and block storage. With the UCA Cloud option, customers get limitless storage with zero management overhead.
- **Ease of manageability** — With one-time setup, securely manage the load balancing, retention, replication,

Changing Healthcare information landscape



distribution and deletion of data automatically, based on the organization's policies.

Enabling Smarter Healthcare

Like it or not, healthcare delivery is changing. And thanks to the open platform of the secure medical information and innovative solutions such as Dell's Unified Clinical Archive, delivered as an on-demand cloud storage platform service, as care moves outside of the four walls of the hospital and a physician's office, a comprehensive, patient-centric electronic health record combining all clinical operations can now be easily created and cost-effectively maintained.

Through such a standards-based, unified record, clinicians across developing ACOs and other healthcare delivery models can be armed with the coordinated information they need to make timely, effective decisions as their needs evolve. The flexibility of on-demand cloud delivery services helps organizations tie together care delivery and the cost of providing the information that supports that care. It enables them to harness

the power of information and the Internet to enable truly smarter healthcare — services that bring the right care, to the right patient, in the right setting, at the right time, to minimize cost — and maximize clinical effectiveness to satisfy the growing expectations of medical consumers.

Through a unified view of comprehensive patient-centric data, coupled with the latest evidence-based medicine, as individuals and as a society we can make smarter decisions about how we receive and deliver healthcare. We can at last achieve true clinical transformation and the improved quality, security, satisfaction and cost-efficiencies that come with it. As we usher in this latest era of healthcare, today we have the tools to effectively combine people, processes, information and technology in collaboration to achieve sustainable improvements in quality patient care.

Learn more about Dell's Unified Clinical Archive strategy by visiting:

www.dell.com/unifiedclinicalarchive

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Unified Clinical Archive Infrastructure

