

Finally, Telemedicine That Works

Vidyo delivers a platform for telemedicine that actually brings clear patient benefits ahead of the significant cost savings

Written by Patrick Moorhead, Founder, President and Principal Analyst at Moor Insights & Strategy, and former board chair at St. David's Medical Center in Austin, Texas.

Executive Summary

The healthcare industry is under extreme pressure to transform itself. Telemedicine was always viewed as a promising technology to drive this transformation, but the cost and inflexibility of most solutions, combined with varied and inconsistent policy hurdles, prevented telemedicine from becoming a widespread reality. Now, however, a new direction in telemedicine and the governing body's policies around it actually make the technology viable, allowing it to finally transform an industry that is practically on life support at this point.

Vidyo delivers a highly scalable software-based conferencing and communications platform that makes technology transparent for healthcare environments by integrating with clinician workflow tools and patient portals. This unprecedented ease of access and use comes with Vidyo's patented adaptive technology that enables it to deliver consistent high quality video, audio, and content across any IP network and user device. It allows physicians, administrators, and patients to easily take advantage of point-to-point and multipoint video conferencing from virtually anywhere, radically changing the dynamics of healthcare delivery.

We believe this is the technology that enables forward-thinking healthcare providers to effectively differentiate and deliver better patient outcomes to broader patient bases, in spite of market-wide cost-cutting measures that otherwise place the patient last in most equations.

Healthcare is in a Transformation

The healthcare industry is ripe for transformation. Over the last 20 years, the demand for medical services has continued to increase while the pool of medical professionals, especially specialists, continues to shrink. As a result, patient access to the right physician for his or her condition increasingly requires costly travel by patient and/or physician, and patient treatment is frequently delayed due to long queues for qualified specialists. And those are the patients who have access to healthcare at all; still too much of the world, including rural areas in the US, lies outside the reach of providers today. According to the World Health Organization, almost 2 billion people (close to 1/3

of the global population) still do not have regular access to essential medicines.¹ Much of this is driven not just by economics but also physical proximity.

Telemedicine, the use of technology to deliver healthcare at a distance, would seem to be an obvious solution to the burgeoning supply-and-demand challenge that exists in the industry. Historically, however, both technological and political roadblocks have impeded the widespread adoption of telemedicine. Real-time video communication technology was dependent on special devices and guaranteed quality of service networks, constraining its utility to applications within a care provider's managed network. The cost of the devices and required infrastructure was significant, so relatively few access points existed. Those that were available were cumbersome, difficult to use, and not at all integrated with the rest of the tools used for clinician-patient interactions; this meant that different workflows existed for remote consultations compared to those that took place in person. To make matters worse, policies set by state medical licensure boards regarding the use of telemedicine as an acceptable replacement for in-person consultation varied on a state by state basis. The rules in many states made reimbursement for telemedicine consults a significant challenge or simply not an option. As a result, healthcare organizations and their physicians were turned-off by the technology and used it only when absolutely necessary.

Recent innovations and technological breakthroughs in real-time video communication from Vidyo, combined with landmark policy change by the Federation of State Medical Boards, have cleared the historical roadblocks to telemedicine. Through the use of telemedicine, physicians can reach more patients and drive better efficiency. In local situations, this drives better physician efficiency by reducing the amount of time moving between tasks. For remote patients, telemedicine brings access to healthcare in situations where it was previously either unattainable or, at best, inconvenient.

While the benefit of telemedicine can have a positive impact in one-on-one interactions, its use in group environments, for handling issues like addiction or cancer support, has been shown to be just as beneficial.

Telemedicine can reduce the cost and increase the velocity of the practice, allowing it to scale more effectively. But, most importantly, this increase brings with it an increased level of contact—which is the polar opposite of most other scaling opportunities in healthcare.

Having a strong telemedicine strategy has become an imperative for major healthcare systems. The top IDNs (integrated delivery networks) in the US are moving rapidly to implement telemedicine programs as a means of extending their reach and improving the quality of care for their expanding patient bases.

¹ http://www.who.int/management/background_4a.pdf

Federation of State Medical Boards Approves Video-based Telemedicine Policy

While it has been widely recognized that telemedicine presents the single-biggest change to healthcare delivery that the market can implement, until recently policy has gotten in the way of progress. The Federation of State Medical Boards (FSMB) is the umbrella organization for the individual state medical licensure boards and creates policies to unify standards of care nationally. On April 28, 2014, the FSMB approved tele-health guidelines that, for the first time, acknowledged that telemedicine consultations between physician and patient were equivalent to in-person consultations as long as the interaction was done via videoconference.² The implication of the decision is that prescriptions may be written as the result of a telemedicine consultation only if it is conducted via videoconference; audio only is not sufficient. Additionally, this paves the way for required reimbursement for video-based telemedicine consultations on a broader basis. While the individual state medical boards still need to decide to adopt the policy, it represents a major step forward in creating an environment of telemedicine-friendly policy with implications for simplified reimbursement models and mainstreaming of telemedicine as a method of care delivery.

Vidyo: A Cure for Common Telemedicine Conditions

Physicians are creatures of habit and have no tolerance for new technology that alters their workflow or doesn't work when and where they need it to. That is why some of the largest Integrated Delivery Networks and Accountable Care Organizations have turned to Vidyo as the platform of choice for their telemedicine applications.

Vidyo is unique from most conferencing and collaboration solutions available in the market today in three critical dimensions that make it an ideal solution for telemedicine.

- **Integrated with the workflow of healthcare.** As a software communications and conferencing platform that was designed from the ground up to be integrated with other applications, Vidyo embeds into the workflow of healthcare. This integration dramatically improves usability and efficiency for clinician and patient.
- **Consistent high quality.** Vidyo's patented technology dynamically optimizes performance for every participant in a conference for reliably high quality interactions—even over variable networks and user devices. As a result, consultations can take place anywhere the internet reaches using devices patients and physicians already have and use every day. Conferences achieve the level of quality necessary to build trust between clinician and patient, and they allow the clinician to see important details as he would in a face-to-face consultation.
- **Priced to scale.** Along with the introduction of a disruptive new technology for video communications and collaboration, Vidyo also disrupted the economics by delivering video, voice, and web conferencing capability at or below the cost of

² <http://www.modernhealthcare.com/article/20140428/NEWS/304289931>

audio-only conferencing. This pricing model makes it easy for healthcare organizations to deploy the platform for enterprise wide communications and collaboration needs. Organizations can further accelerate their return on investment by adding care delivery, patient contact center, and other applications off of the same platform.

Rich Telemedicine Ecosystem Preserves the Workflow of Healthcare

One of the major challenges of traditional videoconferencing solutions is that they exist as hardware-based silos of communication that stand outside of the workflow tools that clinicians rely upon. As a result, clinicians have to break normal workflow to engage in a telemedicine consultation.

From inception, Vidyo was designed as a software platform to be embedded into other software applications and to support the full complement of hardware tools that interface with computers and mobile devices. As a result, Vidyo has become an integrated component of many key clinician workflow tools, such that **telemedicine consults via Vidyo use a consistent workflow with in-person consults**—making it easy for clinicians to adopt. The following are a few examples of ecosystem integrations.

PHILIPS [Philips](#) delivers a variety of clinical programs for healthcare providers including eICU monitoring and management. Using the VidyoWorks APIs, Philips embedded Vidyo into its eCare Manager solution, so that centralized remote intensivists could gain eyes on the patient quickly with a single click right from the patient monitoring dashboard. This enables Integrated Delivery Networks and Accountable Care Organizations to leverage their specialists across more of their facilities, providing the right expertise wherever and whenever needed most.

Epic [Epic](#) builds electronic health records (EHR) software for mid-size to large health systems and has recently added support for Vidyo integration to their system.



[AMD Global Telemedicine](#) provides clinical Telemedicine Encounter Management Solutions which include patient encounter management software, specialized devices like stethoscopes, exam cameras, otoscopes, *etc.*, and consultation services. AMD Global Telemedicine used the VidyoWorks APIs to embed Vidyo inside their AGNES Interactive management suite, so that a clinician can see and hear real-time patient data while having a high quality two way video interaction—all within the same web browser. The real-time Vidyo component makes the encounter more personal and helps build trust in the patient/clinician relationship.

Delivering Just What the Doctor Ordered

Sometimes a visionary care organization needs things that are simply not on the menu in order to execute on its strategy for patient care. These organizations need the

flexibility and tools to innovate and facilitate the delivery of new models of care: whether video-enabling patient web portals, creating custom clients for specific patient populations, or integrating with other existing workflow tools. The same VidyoWorks APIs that Vidyo ecosystem partners use to integrate video communication and collaboration into their off-the-shelf solutions can be used by IDNs and ACOs to create custom solutions. The following are a few examples of such visionary organizations.

AMERICAN WELL™ [American Well](#) is redefining healthcare delivery through a completely online approach that uses telemedicine as its connection between physician and patient. American Well’s mission is to improve access to quality care and make it more affordable and transparent for consumers. Through mobile and web technology that incorporates the VidyoWorks platform, American Well was able to knock down barriers like distance, mobility, and time, thus putting patients more easily in touch with their doctors across a wide variety of circumstances. Accelerating access helps accelerate treatment, leading to better outcomes in less time.



The [Alaska Native Tribal Health Consortium](#) (ANTHC) is supporting statewide health care throughout the largest state in the US. In addition to the sheer distance that makes regular connection between physicians and patients difficult, Alaskans also need to contend with the weather and rugged terrain. But the effects of both distance and weather conditions can be mitigated through the use of telemedicine. Through the AFHCAN program, ANTHC has developed innovative solutions that make it easy for one physician to refer a patient to another physician, or have a consultation with another physician regarding a given patient. The AFHCAN suite of solutions integrates with EHRs and provides rich multimedia capability that adds value to referral and consultation processes, thus expediting treatment while minimizing cost. The AFHCAN solutions integrate Vidyo technology to provide real-time access to remote physicians, which dramatically improves access to physicians—whether the patient lives in Anchorage, Nome, Sitka, or any of the many rural communities in between.

Quality is King in Telemedicine

Telemedicine is built on teleconferencing, and the heart of traditional video-enabled teleconferencing systems is the multipoint control unit (MCU). This is the centralized device that allows more than two endpoints to join in a videoconference. Traditionally, MCUs have been hardware-based solutions due to the high processing demands of transcoding—the encoding and decoding process an MCU goes through to mix video streams into a single composite image for conference participants. Transcoding presents two challenges in delivering telemedicine: performance and scalability.

From a performance perspective, encoding and decoding video streams is a processing-intensive operation that takes time. For applications that are non-real-time, like pre-recorded videos that are played back asynchronously at a later time, transcoding provides a means of changing the video format for use by different

decoders that use different standards. However, for real-time applications like synchronous video communication, the delay introduced by transcoding can lead to very unnatural interactions with conference participants talking over each other due to the delay in receiving the remote side's transmission. Additionally, some of the video information is lost every time you compress or encode it, so transcoding a video stream that was originally encoded by an endpoint leads to loss in the video fidelity and degrades the image quality. The key to using video communication for medical applications is to make it **as close to an in-person experience as possible so the technology becomes transparent**, and the clinician and patient are able to focus upon the patient's health.

Traditional MCUs also rely upon high quality of service networks to enable videoconferences that are free of broken pictures and artifacts. Many will throttle down resolution for an endpoint when network congestion is detected, but they never recover when the congestion clears. This lack of dynamic adaptation to changing network conditions limits video-enabled telemedicine use to cases where both sides of the network are controlled by the healthcare provider's IT organization. Such cases eliminate the possibility of applications like at-home healthcare, access to external specialists, and all mobile health applications.

Solutions that eliminate the need for transcoding, like Vidyo, enable multi-party conferencing by relaying scaled individual video streams to conference participants. This approach makes it possible to deliver the quality of experience necessary for the technology to become transparent for clinicians and patients alike. In addition to removing the delay and quality degradation associated with transcoding, Vidyo uniquely provides the ability to dynamically adapt to changing network conditions in real-time. Vidyo effectively conceals from the end user the flaws of general purpose networks (like the internet) and delivers continuously optimized experiences. Such a solution affords the healthcare provider the flexibility to use video communication for virtually any telemedicine application using readily available, general purpose broadband networks including wireless.

Despite all of the flexibility, ease of use, and high quality over variable networks, according to Vidyo, Vidyo remains HIPAA Compliant with all of the media, signaling, and user login being encrypted to ensure patient privacy and compliance.

Achieving Scale to Bring Care to the Masses

To scale a video-enabled telemedicine solution, both cost and technical feasibility must be considered. The cost portion of the equation presents itself very quickly when comparing transcoding MCU solutions to video relay based solutions. Transcoded videoconferencing requires nearly an order of magnitude more processing power than video relayed videoconferencing at the core network. Processing power translates directly into cost per port. Not only are hardware platforms for transcoding MCUs expensive, but the network behind these non-adaptive devices may need to be upgraded. Networking giant Cisco has long eyed desktop videoconferencing as the next

frontier, mainly because they see that they sell 3 to 5 times as much networking equipment for every dollar of endpoint equipment.³

A video relay software-based infrastructure, like Vidyo, helps hold back the capital expenditures—allowing a healthcare provider to expense out a greater portion of the solution immediately and be less tied into capital depreciation—driving a greater near-term ROI from deployment.

Vidyo is software-based, so it takes advantage of any endpoint device, including smart phones, tablets, computers, and telepresence room systems regardless of the connection (Ethernet, Wi-Fi, LTE, 3G, etc.). Vidyo's intelligent infrastructure knows the capabilities of the endpoints and can adjust the video information delivered to each participant based on the endpoint capability as well as the bandwidth and conditions of the network. Thanks to the efficiencies of its software-based infrastructure, Vidyo is able to deliver voice, video, and web conferencing at or below the cost of what healthcare organizations pay for audio-only conferencing today.

For a more in-depth discussion of how Vidyo disaggregates VidyoRouters to help scale videoconferencing, [download our paper](#) *Vidyo Disaggregates Multipoint Control Unit (MCU) to Scale Videoconferencing* published March 2014.

One Platform: Shortening Time to ROI

Healthcare organizations exist to deliver care to their patients. And telemedicine is the first application for real-time video communication that comes to mind when we think about these institutions. But these organizations are complex and have needs for real-time video communication that extend beyond telemedicine.

First and foremost, healthcare organizations are enterprises that have need for enterprise communication and collaboration. VidyoConferencing is Vidyo's suite of enterprise communication and collaboration products that are supported by the same platform that a healthcare organization may have deployed for care delivery applications.

Similarly, hospitals are marketers in the sense that they need to attract and retain patients. When someone gets bad news from their doctor and they need to choose a facility for treatment or a procedure, they are frequently scared and confused. A high-touch video encounter with a helpful hospital representative within the hospital website could be the differentiator that makes the patient choose one facility over another. Vidyo supports video-enabled contact centers on the same platform as the enterprise communication and collaboration and telemedicine applications.

³ <http://tech.fortune.cnn.com/2011/04/07/cisco-video-conferencing-now-in-75-of-the-fortune-500/>

As the multi-faceted healthcare organization launches new applications on the same Vidyo platform (that was already priced well below traditional video conferencing) the time to return on investment further reduces.

All too often, investments in traditional teleconferencing solutions head out the door via forklift as new technologies are available or new resources are needed. With Vidyo, organizations' investments are protected, because the software-based solution allows easy upgrades to new functionality, and backwards-compatibility helps ensure continued use of deployed legacy video conferencing investments.

The Customer Impact

Through the use of Vidyo, healthcare providers are finding great savings, but—more importantly—they are broadening their patient bases. Vidyo technology and tools allow providers to tap into parts of the market that were previously out-of-reach or to open up new services to their existing base that help differentiate them from their competition.

 Innovative IDNs are leveraging Vidyo to enhance patient outcomes for their own member hospitals and also for surrounding regional hospitals that lack the expertise or capabilities to develop their own telemedicine programs. [Mercy](#) is an Integrated Delivery Network for healthcare services that spans multiple states and institutions. Using Vidyo, Mercy built a telemedicine network to address multiple applications including centralized eICU monitoring. Mercy leverages Philips' eCare Manager integration with Vidyo to enable 24x7 centralized monitoring of ICU patients. With critical care professionals constantly watching and reviewing patient statistics, combined with the capability to gain eyes instantly on any patient being monitored, Mercy has been able to shorten patient stays in the ICU and improve mortality rates. Bi-directional video interaction delivers expertise and immediate assistance to in-room care providers and patients. The outreach services Mercy provides to smaller regional hospitals represents new revenue opportunities for Mercy and better patient outcomes for the regional hospitals.

 The [Ontario Telemedicine Network](#) (OTN) was founded in 2006 as an independent, not-for-profit organization funded by the Government of Ontario. It is currently among the world's largest telemedicine networks. Originally, OTN successfully created an infrastructure that allowed all health providers and organizations across Ontario to participate in telemedicine, connecting more than a thousand clinical sites with traditional H.323 videoconferencing over managed networks. However, to ensure that certain segments of Ontario's geographically-dispersed population were obtaining services when they needed them, OTN required a solution to extend its reach to facilitate clinical telemedicine care directly into patients' homes. It had to work over the public internet and in low bandwidth conditions, and it also had to integrate with the numerous existing H.323 videoconferencing units as well as their proprietary patient scheduling application. The Vidyo platform was identified as the solution because of its ability to dynamically adapt to both network bandwidth and device, strong interoperability capabilities, and rich APIs

to integrate seamlessly with OTN's scheduling platform. With Vidyo, OTN providers can now interact with and care for patients from the convenience of a desktop computer or mobile device. They can expand their care and education conveniently and cost-effectively as well.



Healthcare is one of the industries where communication is time-critical. Providers like [Massachusetts General Hospital](#) (MGH) know that in the case of a stroke, "time is brain" and immediate action is critical. The Partners Healthcare Telestroke Program at MGH supports 32 hospitals throughout Massachusetts, New Hampshire, and Maine by allowing telemedicine communication and collaboration through the use of Vidyo's robust platform. Vidyo's telehealth solution enables specialists from MGH to examine patients at remote hospitals miles away and diagnose and recommend treatments.

Call to Action

Technology changes in the market today alongside the pressure to drive better profitability and medical outcomes are driving the need for new solutions. Those solutions will need to leverage telemedicine.

Previously, telemedicine suffered from the same challenges as traditional videoconferencing: high cost, difficult implementation, limited reach, and poor performance. The capabilities of Vidyo have changed the dynamics of the industry by moving away from the inefficiencies and limitations of transcoding, non-scalable solutions of the past and towards a model that thrives on the pervasiveness of the internet and wide range of low-cost, easy-to-deploy client devices that deliver visually stunning high definition video conferencing experiences.

It is clear that in this ever-changing world of healthcare, both healthcare providers and technology solution providers to the healthcare industry need to differentiate their offerings.

We believe that the economics of telemedicine are too significant to ignore, and to date no other company can provide the compelling value proposition that Vidyo can: not only reducing cost, but also increasing patient satisfaction while strengthening the bond between physician and patient. Both healthcare providers and technology solution providers need to be contacting Vidyo to gain a deeper understanding of how their solutions can help build a better telemedicine experience.

Important Information About This Paper

Author

[Patrick Moorhead](#), President & Principal Analyst at [Moor Insights & Strategy](#)

Contributor

[John Fruehe](#), Senior Analyst at [Moor Insights & Strategy](#)

Editor

[Scott McCutcheon](#), Director of Research at [Moor Insights & Strategy](#)

Inquiries

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