The Evolution of Telemedicine Technology

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22nd International Conference on Telemedicine and eHealth, Casablanca, Morocco December 6-8, 2017
No Longer an Island of Separate Practice
Overview

- Areas of Most Change
- 5 Technology Questions to Ask for Seamless Deployment
- Then and Now Telemedicine Comparisons
- Ways to Weave Telemedicine into General Practice
- Examples of Successful Telemedicine Applications
Areas of Most Change
Areas of Most Change for Telemedicine Technology

- Network and Telecommunications Utilization
- Video Conferencing Limitations for Clinical Care
- Interoperability of Medical Devices
- Cost and Affordability of Equipment
- End-User Application Requirements
- Integration with General Healthcare Practices
Key Technology Considerations

1. How much network utilization is required?
2. How will video conferencing technology be utilized?
3. Are the medical devices and equipment interoperable?
4. Does the technology allow for mobility on both ends?
5. Does the technology have the ability to support multiple medical specialties and applications?
Old and New Technology Comparisons
Availability of Bandwidth Increases Opportunities

- POTS (plain old telephone system)
- ISDN/T-1

- Broadband, 3G, 4G
- Satellite
Decreased Costs of Bandwidth Reduces Barriers

Average Bandwidth and Cost/Mbps in Rural US
Video Conferencing Utilization

CLI Radiance 8775
Approximate Cost = $50,000

Web-Based Video Conferencing
Approximate Cost = $20
In-Band Telemedicine Vs Browser-Based Telemedicine

Codec Required
Approximate Cost= $10,000

Browser & Internet Access Required
Approximate Cost= $5,000
In-band Telemedicine

- All data goes away with call. No capability to capture.
- Codecs required.
- No interoperability between codec brands for stethoscope.
- Stethoscope required at each consulting site.
- No realistic mobility. Doc is tethered to specific location of their hospital video system.
- Cost associated with each consulting site.

DATA CAPTURE: NOT AVAILABLE
EMR INTEGRATION: NOT AVAILABLE
Browser-based Telemedicine

- Keep data after call ends. Capture the images you want.
- Codec optional - NOT required. HD Webcam/ SW VTC
- Codec independent.
- No stethoscope required at consulting site.
- Consult from anywhere with only a browser and headphones.
- Unlimited number of consulting physicians. No additional cost.

DATA CAPTURE: STANDARD
EMR INTEGRATION: AVAILABLE
Devices - Size, Cost and Interoperability

Analog stethoscope, Graphic equalizer, Audio encode/decoder
Approximate cost = $8,000/side

Digital stethoscope with Headset
Approximate Cost = $425 USD
Equipment/Carts – Size, Cost and Interoperability

FRED (Friendly Rollabout Engineered for Doctors)

Dr. SMITH (Simple Mobile Integrated Telemedicine Hardware)
Ways to Weave Telemedicine Technologies into General Practice
Ways to Weave Telemedicine in General Practice

1. Determine how much bandwidth is required to use technology at its optimal performance
2. Select the appropriate Video Conferencing Technology
3. Source medical devices that are interoperable and “plug-and-play” connections
4. Keep physician mobility in mind, making their use of the technology as seamless and “free” as possible.
5. Look for technology that has the ability to support multiple medical specialties and applications as you expand your program.
1. Network Utilization:

- Determine how much bandwidth is required to use technology at its optimal performance.
2. Video Conference Utilization:

- Cost effective desktop and cloud based videoconferencing solutions are becoming much more popular
- Videoconferencing is becoming part of the bigger Telehealth solution
- Integration of videoconferencing into other Health Information Technology systems is key
- Healthcare organizations are looking to use videoconferencing as a platform for population health where they can provide diagnostic Telemedicine, direct to consumer, care coordination and wellness and prevention applications
3. Medical Devices:

- Source medical devices that are interoperable and “plug-and-play” connections.
4. Mobility and Ease-of-Use

- Keep physician mobility in mind, making their use of the technology as seamless and “free” as possible.
5. Support Additional Medical Specialties

- Does the technology have the ability to support multiple medical specialties and applications?
Examples of Successful Telemedicine Applications
Rural Health

- Provides patients who live in rural areas access to comprehensive, high-quality health care in their home communities.
- Helps rural clinics increase the medical specialties they can provide.
- Reduces out-of-pocket travel expenses for patients.
- Connects community physicians and nurses with a network of medical expertise they can access immediately in real-time.

Sidney Health Center
Connects Patients in Rural Communities to Specialty Medical Services

Elliot Lake Family Health Team in Ontario Saves Patients from Driving 4 Hours to See Medical Specialists
Rural Health - Kenya

- With broadband enabled telemedicine, a specialist can advise a general surgeon from anywhere in the world.
Correctional Facilities

- Allows prison facilities to deliver high quality care without the cost and dangers of inmate transportation or the need for a clinical specialist to enter the facility.
- Telemedicine has proven effective for clinical as well as mental health.
- Correctional Facilities have noticed substantial cost savings and found that telemedicine is safe and effective and inmate acceptance is very high.
Industrial Health

- Industrial sites such as mines, drilling platforms or industrial campuses depend on the health of their employees to operate. They must respond to an unpredictable set of health needs to support sometimes hundreds of employees.
- Telemedicine avoids high cost evacuations and assures that the worker receives appropriate treatment and is available to support operations as soon as possible.
Developing Countries

- Telemedicine allows rapid deployment of healthcare to a developing population through relatively low cost clinics.
- Rather than build and staff large numbers of sophisticated facilities, telemedicine allows basic clinics to share the expertise of clinicians and clinical specialist who may be located centrally or decentralized.
School-Based Health Centers

- Telemedicine provides support to the school nurse by allowing nurses access to expert medical opinion on when it is needed.
- A school nurse is an isolated provider yet they have to respond to a variety of needs.
- In some rural communities, the school nurse may be the only healthcare provider. If a school nurse cannot confidently diagnose and treat an issue, the student must be referred many miles away.
Military

- Use telemedicine to diagnosis and treat soldiers in the field.
- Connect specialists who can't be deployed with patients on the battlefield.
Retirement Communities or Assisted Living Communities

- A stationary telemedicine site can be set up in the community or facility. Without leaving the facility, a patient can have a telemedicine visit with a physician, primary care doctor or specialist.
- Telemedicine extends healthcare into homes of retirees to improve chronic disease management and decrease hospitalization.

A traveling nurse or clinician can use a mobile telemedicine solution to initiate a telemedicine visit.
Current Adoption #s of Telemedicine
Telemedicine is a significant and rapidly growing component of healthcare in the United States.

- 200 telemedicine networks in U.S.
- 3500 sites
- Nearly 1 million Americans are currently using remote cardiac monitors.
- U.S. Veterans Health Administration delivered over 300,000 remote consultations using telemedicine.
- Over half of all U.S. hospitals now use some form of telemedicine.
- Millions of patients worldwide use telemedicine to monitor their vital signs to remain healthy and avoid trips to the hospitals and emergency rooms.
Ontario Telemedicine Network, Canada is one of the largest telemedicine systems in the world:

- More than 308,000 patients served, a 51% increase over last year.
- Delivery of virtual care at 1605 sites, on more than 3,000 systems.
- Avoidance of more than 237 million kilometers of provincial travel.
- Elimination of more than 65 million kilograms of pollutants and saving more than 26 million liters of fuel.
What’s Next
Telemedicine Utilizing Virtual Reality

Microsoft Virtual Holoportation
Jenysis Rapid Response Health Containers

Healthcare facilities in 30 minutes
Thank You!

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