

Nuts & Bolts of Telemedicine:  
Technology, Software & Hardware

Stephen Casady

Director of TeleHealth  
Oklahoma State University  
Center for Health Sciences  
Tulsa, Oklahoma

June 10, 2014



---

---

---

---

---

---

---

---

Who can use telemedicine services?

Almost everyone...

© 2014 Oklahoma State University



---

---

---

---

---

---

---

---

Did you know ....

Well over 50% of U.S. hospitals have  
adopted telehealth platforms and are  
using technology to treat patients

© 2014 Oklahoma State University <http://www.healthcareinews.com/news/telehealth-takes-nationwide>



---

---

---

---

---

---

---

---

## Did you know ...

A 2011 HTRC survey found that 57% of telemedicine is rural to rural in Oklahoma

© 2014 Oklahoma State University



---

---

---

---

---

---

---

---

## Benefits

Cost Savings  
Time Savings  
Convenience  
Challenges\Solutions

© 2014 Oklahoma State University



---

---

---

---

---

---

---

---

## Cost and Time Savings

1. Physician Down-Time decreased
2. Physician and patient travel time can be decreased
3. Patient and family costs can be decreased
  - a. Fuel
  - b. Overnight or long term stays
  - c. Food costs (eating out while in urban areas)

© 2014 Oklahoma State University



---

---

---

---

---

---

---

---

## Convenience

1. Families don't have to be uprooted
2. Comfort of your local doctor's office versus a large hospital in an urban area
3. The ability to remain with family in your hometown
4. Ability to keep children in their home town school if long term care is needed

© 2014 Oklahoma State University




---

---

---

---

---

---

---

---

## Challenges and Solutions

### Challenge

- Elderly patient who is not comfortable with technology

### Solutions

- Provide training and access to health record information on a patient portal that they can review at home or with family.
- Continue to provide face to face services for normal appointments and consider telemedicine only in special situations such as telestroke services.

© 2014 Oklahoma State University




---

---

---

---

---

---

---

---

## Challenges and Solutions

### Challenge

- Younger patient who is concerned about their privacy and security

### Solutions

- Provide written information and make sure to discuss that telemedicine appointments are not recorded or reviewed by others.
- Explain the cost savings & conveniences that telemedicine can provide.
- Offer the patient the opportunity to participate in telemedicine or to travel for services.

© 2014 Oklahoma State University




---

---

---

---

---

---

---

---

**Challenges and Solutions**

<p><b>Challenge</b></p> <ul style="list-style-type: none"> <li>• Telemedicine sessions can require activities not normally part of an appointment resulting in extended times to provide the appointment.</li> </ul>	<p><b>Solutions</b></p> <ul style="list-style-type: none"> <li>• Prior to beginning telemedicine services, consider the workflow changes that may be necessary.</li> <li>• Plan to have someone that can provide the additional services prior to appointment (similar to gathering vitals).</li> </ul>
--	---

© 2014 Oklahoma State University

---

---

---

---

---

---

---

---

**Challenges and Solutions**

<p><b>Challenge</b></p> <ul style="list-style-type: none"> <li>• Having the proper person who presents the patient and uses the telemedicine tools and equipment.</li> </ul>	<p><b>Solutions</b></p> <ul style="list-style-type: none"> <li>• Prior to offering telemedicine services make sure that the person who will be presenting is             <ul style="list-style-type: none"> <li>- Comfortable with technology</li> <li>- Trained well on how to use the telemedicine equipment</li> <li>- Able to troubleshoot or work around issues that may arise</li> <li>- Able to perform the services that will be required in the time allotted for appointment</li> </ul> </li> <li>• Schedule to retrain staff regularly on use of equipment</li> </ul>
--	--

© 2014 Oklahoma State University

---

---

---

---

---

---

---

---

**Challenges and Solutions**

<p><b>Challenge</b></p> <ul style="list-style-type: none"> <li>• Funding for equipment and data connections, training, and support</li> </ul>	<p><b>Solutions</b></p> <ul style="list-style-type: none"> <li>• Grants</li> <li>• Federal Healthcare Connect Fund</li> <li>• USAC Telecommunications Program (Primary Program)</li> <li>• State Programs that Help Fund Telemedicine Data Services and Equipment</li> <li>• Telehealth Consortia within Your State</li> </ul>
---	--

© 2014 Oklahoma State University

---

---

---

---

---

---

---

---

# Equipment

Videoconferencing  
 Digital Equipment (sending real-time information to Physician)  
 iPads, Tablets, & Smartphones  
 Integration with EHR and EMR Systems  
 Home Health  
 Google Glass

© 2014 Oklahoma State University




---

---

---

---

---

---

---

---

# Videoconferencing

A Physician's Cart Combines video technology and computer applications to be the "eyes and ears" of the specialist and allows the patient to see and correspond with the specialist. They are comprised of video monitors and conferencing tools to enable sound and video to be streamed over a secure internet connection in real time.



© 2014 Oklahoma State University

<http://www.spectracomgroup.com/polycom-practitioner-sahelhealth-cart-hdx-720p-720028970001-p-1378.html>




---

---

---

---

---

---

---

---

# Digital Equipment sending real-time information to Physician

1. Digital stethoscope
2. Otoscope
3. HD camera for:
  - a. Wound care
  - b. Dermatology
  - c. Other specialties
4. EKG
5. Ultrasound



© 2014 Oklahoma State University

<https://www.muhimbi.com/Products/Healthcare/Healthcare.aspx> <http://www.grweb.com/jr-flaw/2008/06/28/370711ATCinToneUltrasoundProvider3.jpg>




---

---

---

---


---


---

---

---

### Telemedicine Kiosks



© 2014 Oklahoma State University 

---

---

---

---

---

---

---

---

### iPads, Tablets, & Smart Phones



- Patient Monitoring
- Ultrasounds
- 12 lead EKG
- Videoconferencing
- EHR/EMR Access
- Blood Glucose Testing
- Blood Pressure Testing
- Blood Oxygen Level Testing

© 2014 Oklahoma State University 

---

---

---

---

---


---


---

---

### Integration with EHR and EMR Systems

- Equipment and software are now being released that integrate many telemedicine devices with existing EHR/EMR Systems.
- Results and data are automatically updated in to the EMR/EHR allowing more time to be invested providing patient care.
- Immediate results on progress over time are becoming available through these integrations.



© 2014 Oklahoma State University 

---

---

---

---

---

---

---

---

### Home Health

- In home wireless monitoring services and devices are now readily available.
- Patients take tests and measurements that they already perform and the information is then sent to the monitoring system or doctor's office or hospital where it is stored and reviewed.
- Patient records are available on a daily basis for time-based analysis and review.



© 2014 Oklahoma State University <http://www.mhahltask.com/2012/07/home-monitoring-of-seniors-wb-drive-wearable-devices/>



---

---

---

---

---

---

---

---

### Google Glass



© 2014 Oklahoma State University



---

---

---

---

---

---

---

---

### Common Specialties Provided Via Telemedicine

- Radiology (Over 30,000 reads per month on the OSU TeleHealth network alone)
- Psychiatry/Behavioral Medicine
- Hepatology
- Rehabilitation
- Speech Teletherapy
- Dermatology
- Wound Care
- HIV Care

- Stroke Care
- Cardiology
- Pediatrics
- Orthopedics
- Ophthalmology
- Internal Medicine Infectious Disease
- Pulmonology
- Obstetrics/Gynecology
- Osteopathic
- Physical Therapy

© 2014 Oklahoma State University



---

---

---

---


---

---

---

---

Questions?



© 2014 Oklahoma State University

---

---

---

---

---

---

---

---