Telemedicine Toolbox

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Disclosure

• Speaker: Bryan Burke MD
• I do not have anything to disclose.
• I do have things to confess, though this may not be the appropriate venue...
Hugo Gernsback’s 1925 Teledactyl – Solomon was right!
Teledactyl set-up

Showing how the teledactyl is worked. The impulses of the teledactyl are transmitted by radio to the patient, who, in turn, has a similar instrument, which not only receives but also transmits the same impulses. In the patient’s room is also stationed a television transmitter, which transmits the light impulses back to the doctor.
Hugo Gernsback - 1925

Radio Teleview of Document At Distant Station

Rec. Loop

Geo Wall
Definitions

Telemedicine:
the use of medical information exchanged from one site to another via electronic communications to improve patients’ health status.

Telehealth:
encompasses a broader definition of remote healthcare and includes everything not directly related to patient care – like tele-education, disaster and terrorism response, regional health information sharing, research, and administration.
The Four Basic Ways to Use Telemedicine

Tele-education

Tele-consultation

Tele-practice

Tele-research
Tele-education
Tele-education
How Does it Help My Patients and Me?

Adult Learning

Smith CE, et al., Pediatric Annals, October 2009
Types of Continuing Medical Education

- Archived
- Live Streaming
- Interactive

Smith CE, et al. *Pediatric Annals, October 2009*
Tele-Education
Tools Needed

**Archived**
- Computer with speakers
- Internet Connection ($35-$55/month)
- [Example of archived lecture](#)

**Streaming**
- Computer with speakers
- Internet Connection ($55-$75/month)
- High Speed Broadband (minimum bandwidth 768k down)

**Interactive**
- Web Cam with microphone ($60)
- Computer with speakers
- Internet Connection - High Speed Broadband (minimum bandwidth 768k down, 384k up) ($35-$75/month)
- Allows for face to face real time communication
Tele-Education Tools Needed

Video Conference Unit

- Internet Connection – High Speed Broadband (minimum bandwidth 1meg download and 384k upload) ($75 - $100/month)
- H.323 Video Conference Unit with 24 inch display (varies from $1,000 to $20,000)
- Allows for face to face real time communication
Training and Support

- Recommend that you have a reliable contact information with a local Internet Service Provider and your equipment provider.
- On-line (synchronous or asynchronous)
- Training Center
Tele-Consultation
Tele-Consultation
How does it Help My Patients and Me?

Quicker clarification of diagnostic confusion

Tele-Consultation
How does it Help My Patients and Me?

Therapy more appropriate

Tele-Consultation
How does it Help My Patients and Me?

Therapy begun quicker

Tele-Consultation

How does it Help My Patients and Me?

Patient convenience

Enhancing the Medical Home
Tele-Consultation
How does it Help My Patients and Me?

Patient remains with the local provider.

Tele-Consultation

How does it Help My Patients and Me?

Patient less burdened by travel, cost, and time.
Tele-Consultation
How does it Help My Patients and Me?

Patient less burdened by travel, cost, and time.
Tele-Consultation
How does it Help My Patients and Me?

Prestige for the local provider.

Tele-Consultation
How does it Help My Patients and Me?

Prestige for the local provider.
Tele-Consultation

How does it Help My Patients and Me?

Reduced duplication of care.
Tele-Consultation
How does it Help My Patients and Me?

Increased Continuity of Care.
Tele-Consultation
How does it Help My Patients and Me?

Practice enhancement in the eyes of your patients.
Tele-Consultation
How does it Help My Patients and Me?

Practice enhancement in the eyes of your patients.
Tele-Consultation
How does it Help My Patients and Me?

Virtual curbside consults.
Tele-Consultation
How does it Help My Patients and Me?

Indirect and almost unintentional physician education.
How do I get telemedicine services?
Tele-Consultation
Tools Needed

Patient Assessment
Physical exam NOT required

- Secure Web Cam Connection with microphone (**$60**)
- Computer with speakers
- Internet Connection - High Speed Broadband (minimum bandwidth 768k down, 384k up) (**$35-$55/month**)
- Encrypted software service (**$150 - $250**)
Tele-Consultation
Tools Needed

Patient Assessment
Physical exam required

- Video Conference Unit
- Internet Connection – High Speed Broadband (minimum bandwidth 1meg download and 384k upload) ($75 - $100/month)
- H.323 Video Conference Unit with mounted display ($20,000 - $30,000)
  - Medical Grade
  - Scopes – ENT, Stethoscope, General Exam, Derm, etc..
Tele-practice
Tele-practice
How does it Help My Patients and Me?

For the generalist

Herendeen NE, Schaefer GB. Practical Applications of Telemedicine for Pediatricians. October 2009

Tele-practice

How does it Help My Patients and Me?

For the generalist
Tele-practice
How does it Help My Patients and Me?

For the sub-specialist

Allows connection with your patients from your office or hospital.

Tele-practice
How does it Help My Patients and Me?

For the sub-specialist

No wasted time traveling to remote clinics.
Tele-practice
How does it Help My Patients and Me?

For the sub-specialist

Decreased no-show rate.
Tele-practice

How does it Help My Patients and Me?

For the sub-specialist

Decreased waiting time for appointments.

Alexander A, Farst K. Pediatric Annals, October 2009,
Tele-practice
How does it Help My Patients and Me?

For the sub-specialist

You can bill for your care just like you do in the office
Tele-practice
How does it Help My Patients and Me?

For the critical care sub-specialist

Allows quicker, more accurate assessment of your patients.

Dharmar M, Marcin JP., *Pediatric Critical Care Medicine* 2009
Tele-practice
How does it Help My Patients and Me?

For the critical care sub-specialist

Allows you to institute more specific care, more quickly, than with a telephone call.

Tele-practice

How does it Help My Patients and Me?

For the critical care sub-specialist

Even prevents unnecessary and costly transfers to your hospital.

Hall-Barrow J et al., *Pediatric Annals*, October 2009
Tele-practice
How does it Help My Patients and Me?

For the critical care sub-specialist

Allows back-transport more quickly, with follow-up distant care

Hall-Barrow J et al., *Pediatric Annals*, October 2009
Tele-practice
How does it Help My Patients and Me?

For the critical care sub-specialist

Allows out-patient post hospital care
Telemedicine for My Community
## Tele-practice

### Tools Needed

**Interactive Equipment for Consulting Sites**

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Cost</th>
<th>Description</th>
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<tbody>
<tr>
<td>Web Cam with microphone</td>
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Tele-practice
Tools Needed

• Interactive Equipment for Receiving Sites

Video Conference Unit

• Internet Connection – High Speed Broadband (minimum bandwidth 1meg download and 384k upload) ($75 - $100/month)
• H.323 Video Conference Unit with mounted display ($20,000 - $30,000)
  • Medical Grade
  • Scopes – ENT, Stethoscope, General Exam, Derm, etc..
Tele-Research
Access for your Patients

Access to Clinical Trials

Gonzalez-Espada WJ et al., Pediatrics 2009
Access for your Patients

Increase catchment for clinical trials
Access for your Patients

Translational Research
Access for your Patients

New frontiers for telemedicine research
Tele-research

Tools Needed

Patient Assessment
Physical exam NOT required

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Tele-research
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Telemedicine and Telehealth Summary

• An amazing new tool that benefits everyone.
• Limited chiefly by our imaginations.
• Will become commonplace.
• You should become involved!
• Pick one project and do it well.
• Expand as your patient’s needs, and your own, demand.
• **Alaska** - pays for telemedical care (TMC) for professionals but not for the equipment or systems.