

# Telemedicine: Innovations to Advance Care

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# Objectives

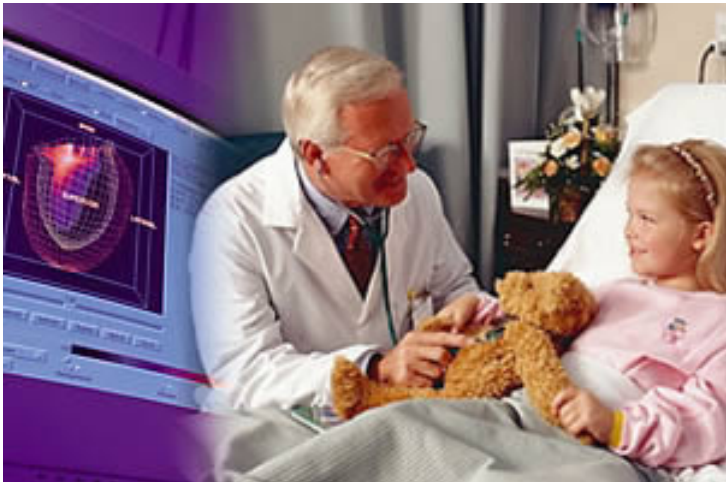
- Outline telehealth opportunities in clinical care.
- Discuss the risks and benefits of opportunities in telehealth.
- Delineate potential future directions for developments in telehealth.

# Telemedicine

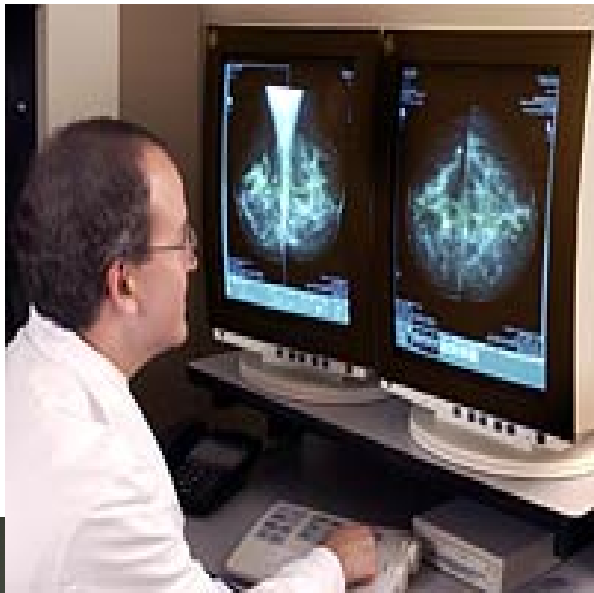
The Institute of Medicine defines telemedicine as “the use of electronic information and communications technologies to provide and support health care when distance separates the participants.”

telemedicine  
=  
medicine at a distance

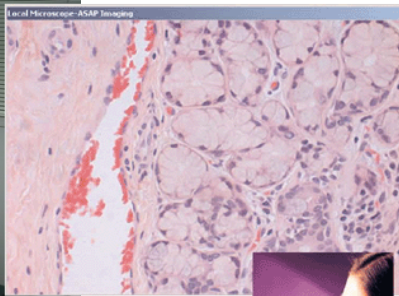




# Medical Consultation



# Teleconsultation







# Clinical Opportunities



# Teleconsultation Modalities

- Real-time
  - Fully interactive videoconferencing
  - Use specific attachments for the physical exam
  - Requires scheduling of teleconsultant, telepresenter and patient
- Store-forward
  - Transmit information for later interpretation
  - Requires scheduling of teleconsultant

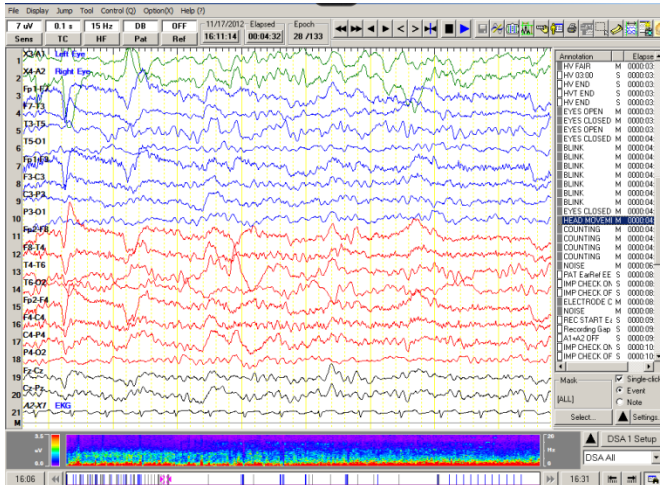
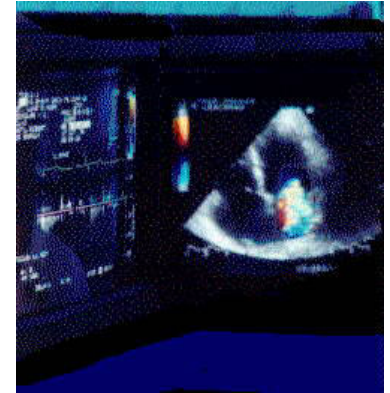
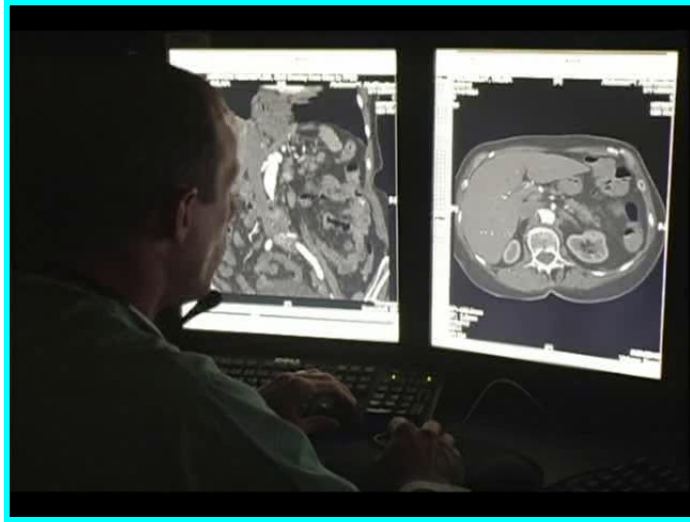
# What Makes a Good Teleconsultation?

- Understand the goal of the consultation
  - Increase access to specialty care
  - Confirm diagnosis
  - Assist in triage
- Assure complete data and diagnostic images
- Built in quality review

# Visual Specialties

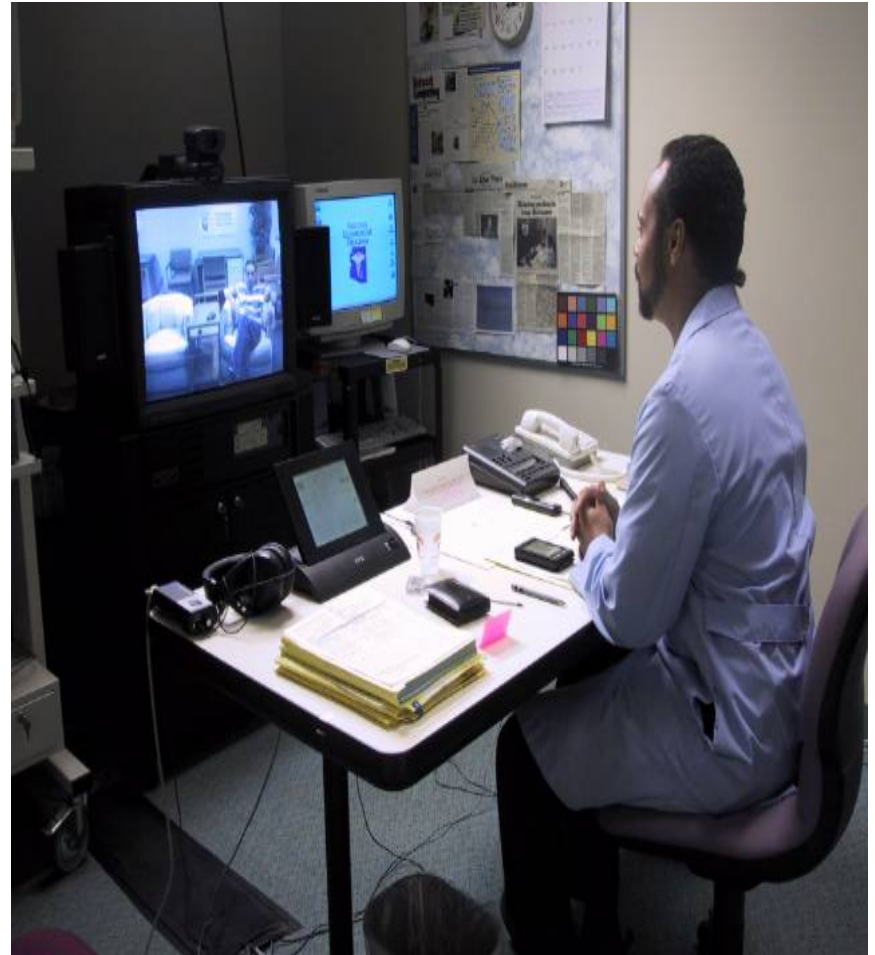


# Technology provides images/sounds



# “The talk is the treatment”

- Psychiatry/psychology
- Genetic Counseling
- Nutrition
- Physical activity
- Support group
- Hospice care



# Videoconferencing and Store-Forward Applications



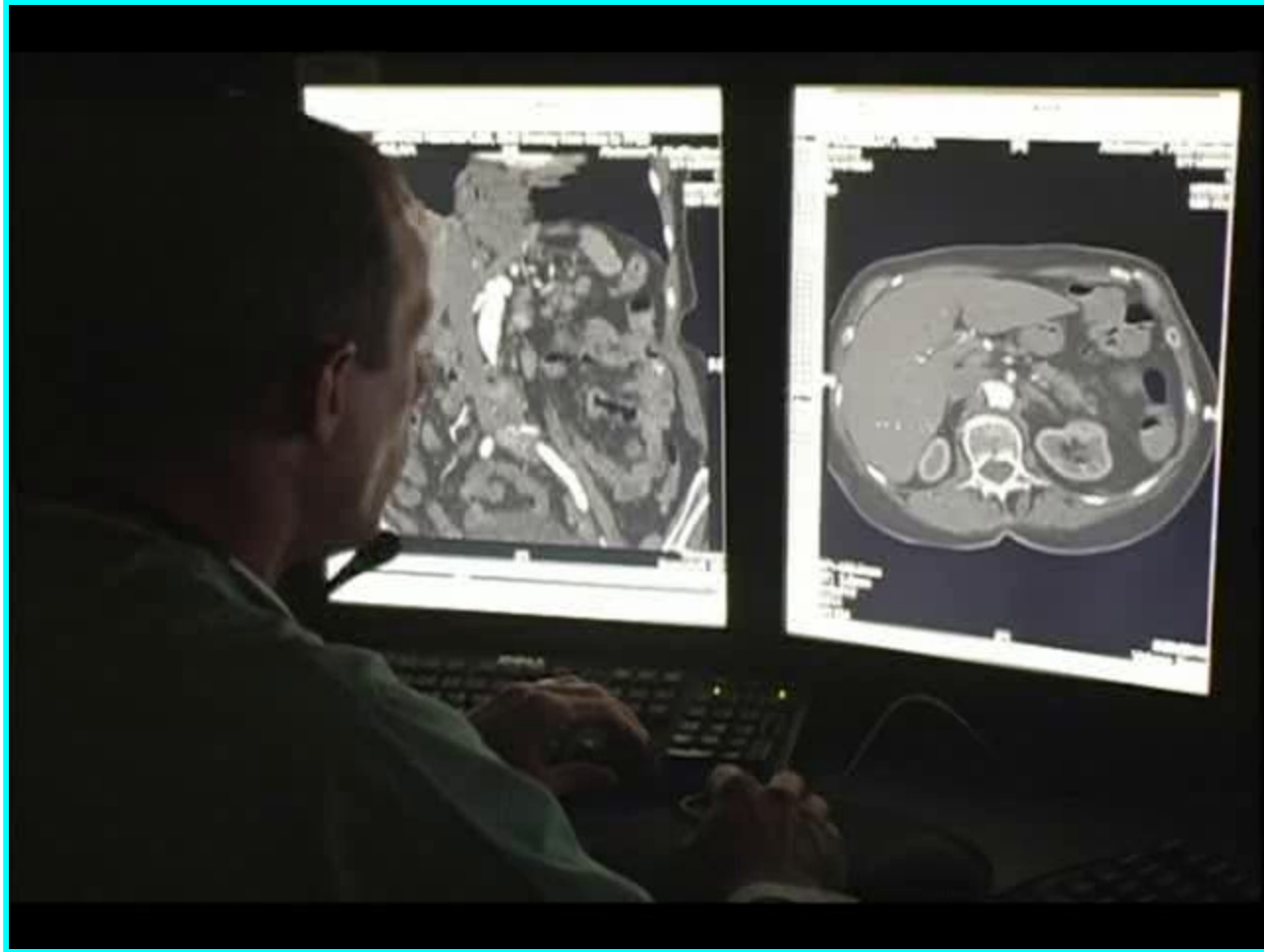
- Infectious disease
- Geriatrics
- Pain Management
- Pharmaceutical review
- Oncology



Some Highlights!



# Teleradiology



# Digital Mammography



# Fetal Ultrasound





# Telecolposcopy

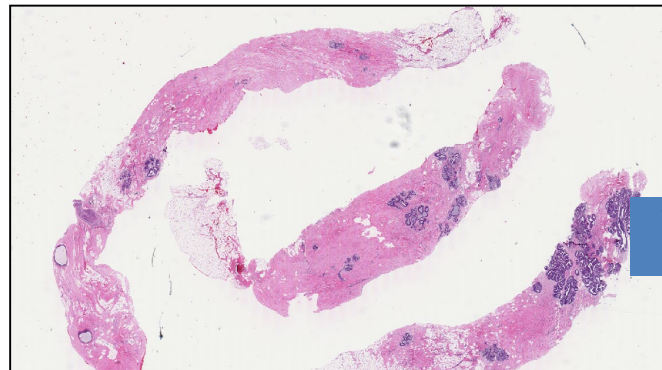


# Infectious Disease



# Telepathology

- Common area of need
- Barriers:
  - Inability to review all the tissue
  - Length of fixation
  - Cumbersome nature of robotic microscopy



Virtual Slide

# Bundling of Services



# Teletrauma



# TelePainClinic



# Tele-Stroke

- Tele-emergency medicine
- Teleradiology
- Teleneurology

# Teleoncology

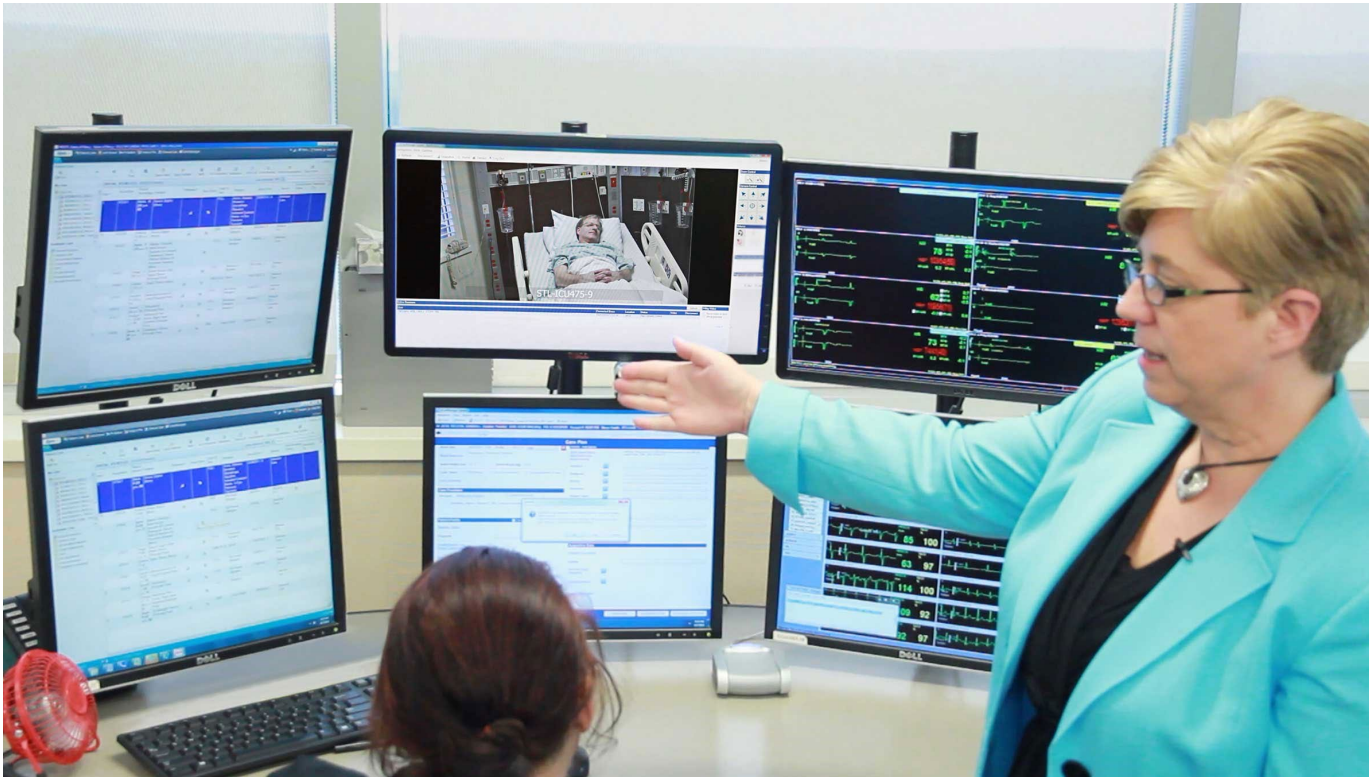
## ***Use of telehealth technology in cancer care.***

- Multidisciplinary in nature:
  - Prevention, early detection, diagnostic consultation, surgical oncology, medical oncology, radiation oncology evaluation, clinical trial education and evaluation, supportive care and follow-up, palliation, tumor board and chart review models of care.



# Telemedicine e-ICU scenarios

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<http://www.forbes.com/sites/patrickmoorhead/2014/05/13/vidyo-gets-the-jump-on-next-generation-telemedicine/>

# Diabetes Days



# Clinic Room Design

- Economic use of space
  - Camera placement
  - Mic placement
  - Patient exam area
  - Lighting
  - Background
- Easy to use equipment
  - Ergonomics
- Key to success: a Telemedicine Site Coordinator



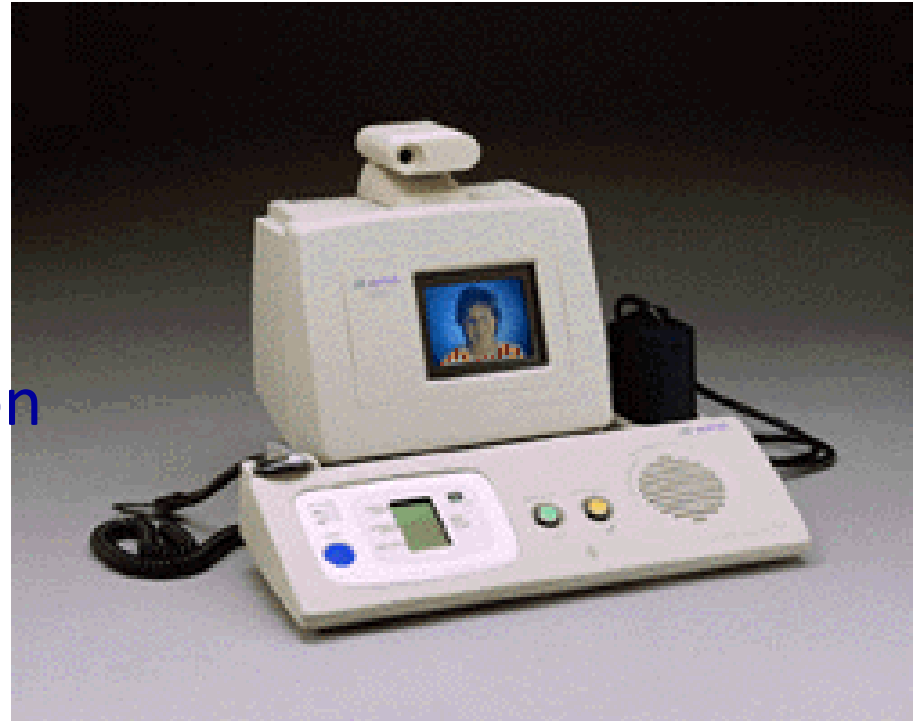


# Telemedicine Site Coordinator



# Home Health Care Applications

- Wound care
- Post-operative care
- Pre-organ transplantation
- Physical therapy



# Tele-Home Health



**Blood Glucose Monitor**



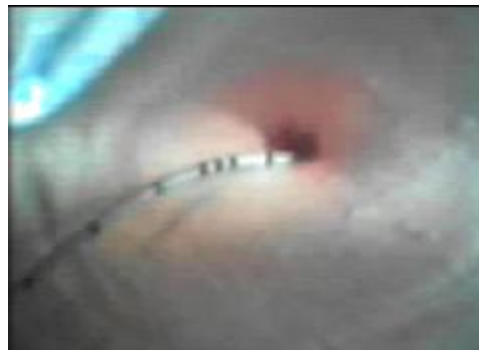
**Central Nurses Station**



# Tele-Home Health



Colostomy



Urostomy



# Portable Telemedicine System

**Canon G2  
4.0 M pixel  
Digital Camera**

**American  
TeleCare  
Digital  
Stethoscope**

**Koss Porta Pro  
15-25,000 Hz  
Headphones**



**Starview SV  
8000i  
IP Videophone**

**to Wireless LAN  
Connection**

**to 100V-240V AC**







# Professional Clinical Education



Chart Rounds

Arizona Telemedicine Program 2013



# Patient Tele-Education



**St. Elizabeth of Hungary Clinic  
Tucson**

# Newest Health Care Tool





In US,  
64% own a smartphone  
90% own a cell phone  
70% shop online regularly  
15% do not use the  
internet\*

\*Pew Research Center

# Patient reported outcomes

- Reporting vital signs from a distance
- Reporting of symptoms from a distance
- Telenursing contact when initiated by
  - Patient symptom prompt
- Teleoncology contact initiated by nurse
- Feasibility, clinical/cost efficacy

NCI: SBIR

# Symptom Monitoring





# There's an App for That!



<http://www.imedicalapps.com/2015/01/physicians-medicare-telemedicine-reimbursement/>

# The *Virtual* House Call



Arizona Telemedicine Program 2013

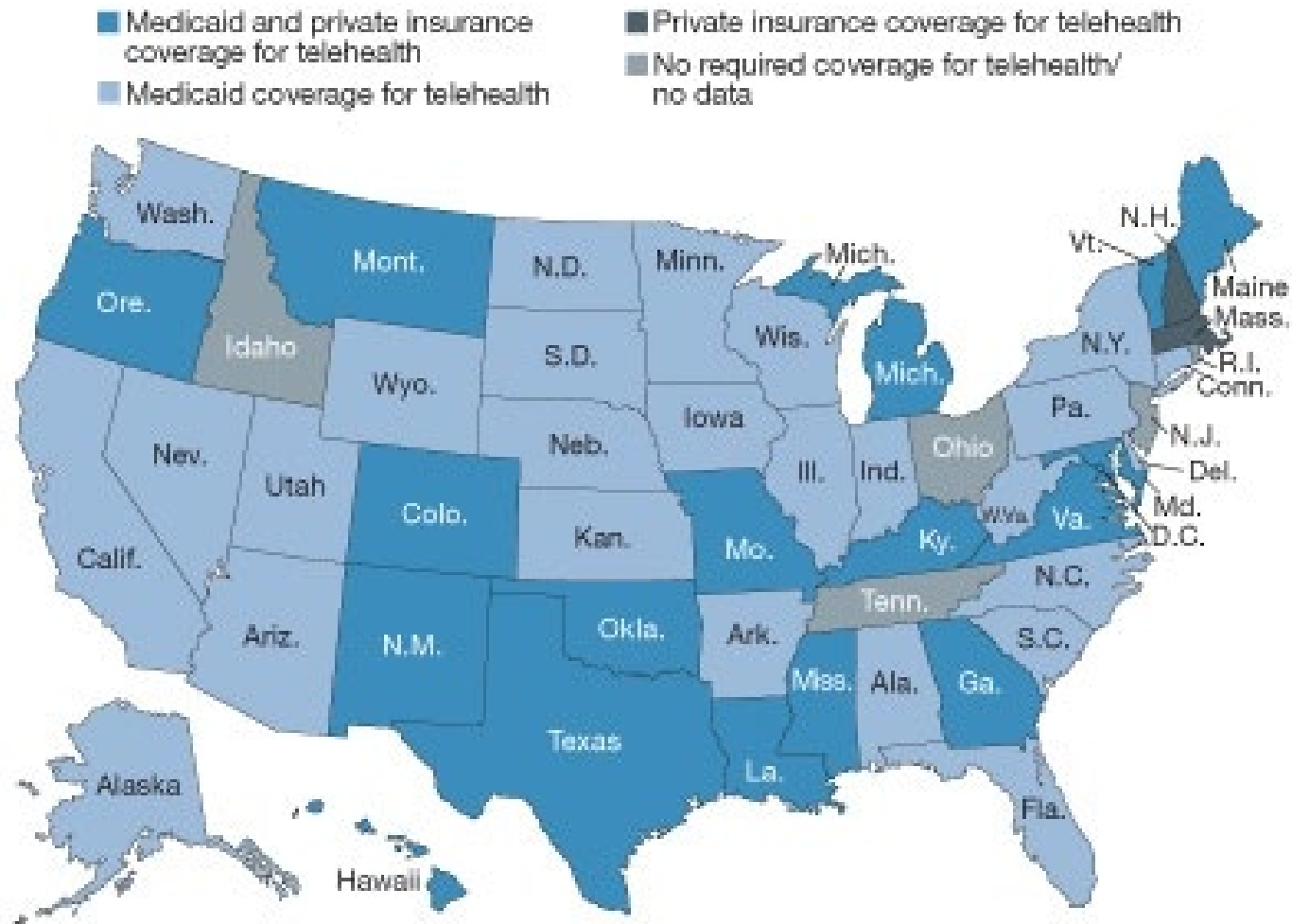
# Limitations



# Virtual Reality Palpation



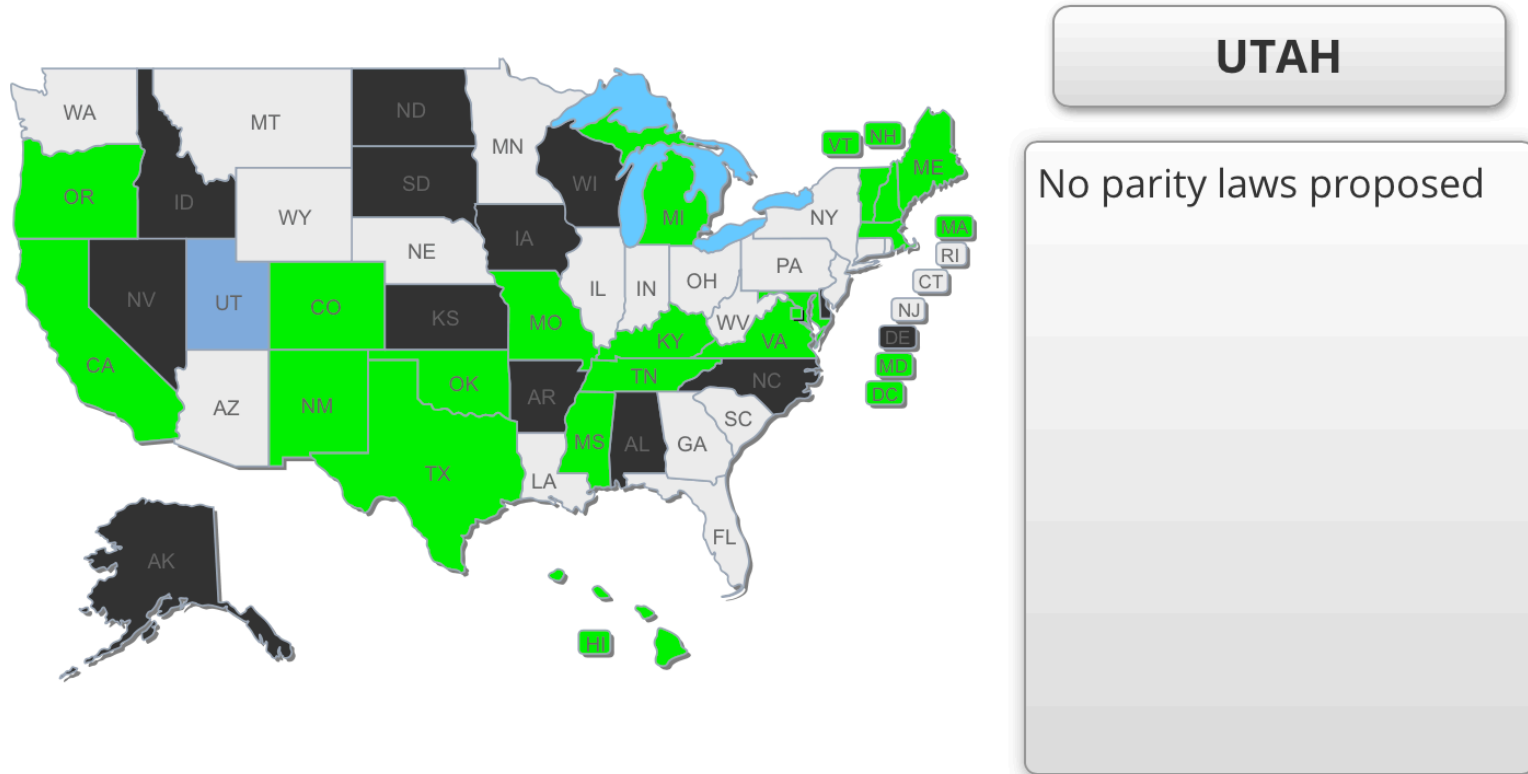
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Source: National Conference of State Legislatures



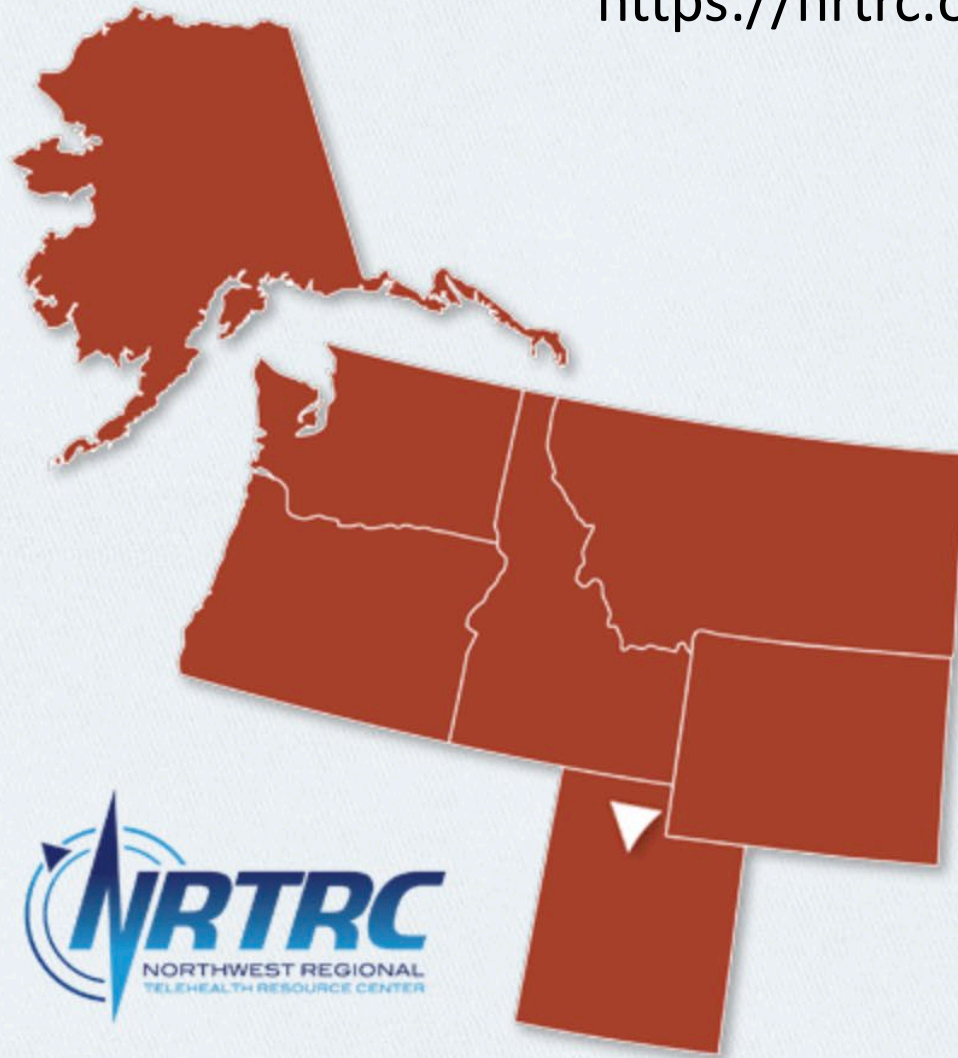
# Telemedicine Reimbursement Policy in the 50 States



Parity laws for telemedicine reimbursement by state vary widely. This map summarizes telehealth parity rules for private insurance or Medicaid in all 50 states. Federal rules for telemedicine reimbursement are limited under Medicare. A new [Medicare telemedicine parity bill](#) introduced this year could be changing this.

# Northwest Regional Telehealth Resource Center

<https://nrtrc.org>



Regions Served:

Alaska, Idaho, Montana, Oregon, Utah,  
Washington, and Wyoming

# Thank You to...

- The participants
- The collaborators/partner sites
- The funders:
  - Better Than Ever
  - Health Resources and Service Administration
  - Arizona Biomedical Research Commission
  - National Cancer Institute





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See Page 1406



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Thank you!

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