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**Telehealth: Overview and Applications in Neurorehabilitation**

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## Opportunity

### IMAGINE

A young woman living in a rural area with limited availability of therapists

↓

After suffering a acquired brain injury, she is discharged to home.


↓

An distant OT specialist meets with her via **videoconferencing telehealth application**

### Opportunity Overview

- ✓ Shortage of health care professionals due to population growth, aging, and chronic diseases
- ✓ Disparity of quality of healthcare by location
- ✓ According to USDA statistics, rural areas consist of all territory located outside of urbanized areas and urban clusters. The U.S. rural population was 59 million (21 percent) in 2000.  
(<http://www.ers.usda.gov/Briefing/Rurality/vhnetisRural/>)

**The therapist with videoconferencing telehealth application, can do the following:**



- Consult with other specialists
- Evaluate and assess
- Progress therapeutic activities
- Provide caregiver support/education
- ADL retraining and modifications
- Care management

### Opportunity Overview

- ✓ Over 2.3 million Internet users or 77.3% of the U.S. population, according to International Telecommunication Union.  
(<http://www.internetworldstats.com/am/us.htm>)
- ✓ 8 million people a day go online to research health care topics and products (Pew Internet and American Life Project)
- ✓ Global Telehealth Market set to exceed \$1 Billion by 2016 (InMedica.com statistical report, 9/15/11)

## Telehealth Opportunity for Rehab Professionals:

Access to clients or potential clients

Provide specialist care and consultation

Supervision of providers



## History of telehealth

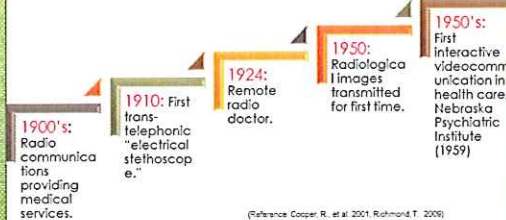
## Telehealth Opportunity for Rehab Professionals:

Care delivered within context of client and community

Educating, training, and mentoring of others



## History of Telemedicine

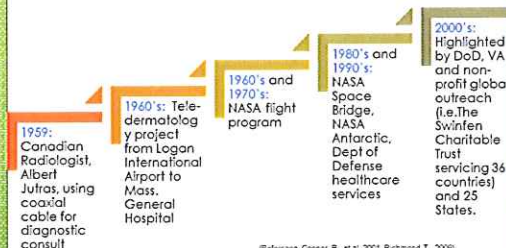


(Reference: Cooper, R., et al. 2001, Richmond, T. 2009)

## Where does technology fit into delivering health care services?



## History of Telemedicine



(Reference: Cooper, R., et al. 2001, Richmond, T. 2009)



## Health Care Reform Initiatives

Increase in coverage

Change in how we deliver and manage health care services (health informatics)

Increase in prevention and wellness

\*Added the tools required to meet challenges

-Standardized care/outcomes  
-Application of Technology



## Related Key Terms:



## Defining Key Terms

## OTA Definition of Telehealth\*

- As it relates to occupational therapy, telehealth is: **"the application of evaluative, consultative, preventative, and therapeutic services delivered through telecommunication and information technologies."**
- New definition to include both synchronous and asynchronous technologies

\*Revised definition in Telehealth Position Paper currently under review

## Key Terminology

Telemedicine and telehealth are legally defined as meaning the same

Telehealth is a broad term that includes non-clinical and clinical health care services, information, and education delivered through technologies.

Asynchronous is store and forward types of information



Distant site is where the provider is located


Synchronous means live, interactive communications

Originating site is where the client is located




## Example of Synchronous

Live, real time interaction between patient and provider can include mobile devices. (i.e. secure web conferencing, mobile conferencing)



Provider is evaluating medical information being sent from monitoring device, from diagnostic testing, or recorded video for purposes of care planning.


### Example of Asynchronous



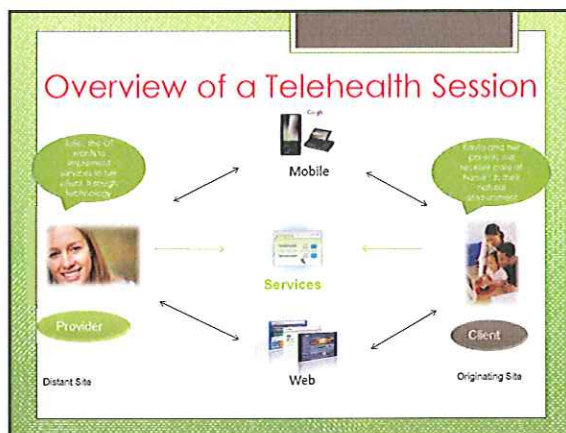
- Recorded and stored video
- Recorded data from monitoring devices such as blood pressure
- Digital photographs
- Electronic communication

(i.e. home monitoring)

## Telehealth Benefits



(Bashur & Shannon, 2009)



## Telehealth Benefits

- Accessibility of services**
  - Services to remote, global, incapacitated, aging in place
  - Services by providers and specialists otherwise unavailable
  - Prevention of unnecessary delays in receiving care
  - Distance learning, teaching, consultation, and research
- Increase quality of care**
  - Distance learning, sharing, teaching, supervising
  - Improve standards of care through electronic data exchange, tracking, and measuring
  - Continuity of Care
  - Increase effectiveness of chronic disease management
- Improve outcome measurements**
  - Empower the patient; management, education, record keeping
  - Monitoring devices, alert systems, data collection
  - Promote individual adoption of healthy lifestyles (Bashur & Shannon, 2009)

## Benefits and limitations

## Limitation Key Issues

Licensure	Privacy & Security	Access to Technology	Limited Reimbursement	Licensure Portability
Scope of practice (inclusion)	HIPAA requirements	Geographic barriers	NO coverage by Medicare	Provider and client have to be in same state
Not always on provider list of payers	Risks in security	Technology unavailable	Payers can restrict payment	Provider has to be licensed in state where client lives
		Socio-economical disparity		



## Licensure portability committee reports and ongoing research...

INTERNATIONAL JOURNAL OF TELEREHABILITATION - TELEREHABILITATION



### Resolving Barriers to Licensure Portability for Telerehabilitation Professionals

Blair N. Davis, Ph.D., Julie A. Brinson, M.A., Jara Casas, PhD, CMA, Assistant Secretary Assistant Secretary, State of Texas, Licensure Portability Working Group Report

INTERNATIONAL JOURNAL OF TELEREHABILITATION - TELEREHABILITATION



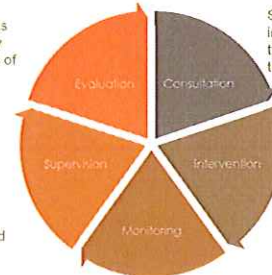
### Making the Case for Uniformity in Professional State Licensure Requirements

Julie A. Brinson, Blair N. Davis, and Jara Casas, Assistant Secretary Assistant Secretary, State of Texas, Licensure Portability Working Group Report

Current research: State-by-state analysis of licensure requirements

## Telehealth 5 Models of Care

Evidence supports use of technology across all models of care



Services incorporate various types of technologies

Consider the key clinical, administrative and technical principles

Follow standards and guidelines

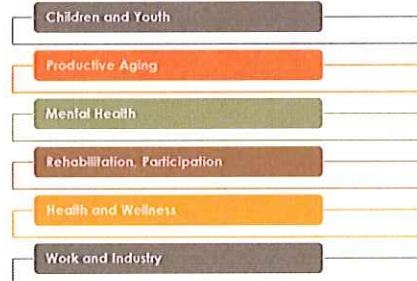
## 2013 Legislative Update

### Federal Government

- At the end of 2011, the STEP Act was approved, allowing credentialed health care professionals in the Department of Defense to work across state borders without having to obtain a new state license. Look for proposals in 2013 to expand this provision to other federal programs.
- Rep. Mike Thompson (D-Calif.) has introduced legislation (HR 6719) that proposes major changes in state-based physician licensure, as well as expanded coverage in all federally sponsored insurance programs
- CMS - Rules affecting accountable care organizations, meaningful use, medical homes and patient-centered care are only a few of the many areas that will be under discussion within the agency.

Adapted from: <http://www.rehabilitationmedicine.com/2012/02/24/2013-legislative-update-for-rehabilitation-2012-02-24/>

## Apply across areas of OT Practice



## Evidence - Telehealth

## Evaluation

### Key Studies

- Wheelchair prescription (Balfour, Uta, & Sekula, 2006; Schrein, Schmeier, Brenza, Sapienza, & Parniano, 2006; Schrein, Schmeier, Holm, Sapienza, & Brenza, 2010; Schrein, Schmeier, Holm, Parniano, Sapienza, & Brenza, 2011).
- Neurological assessment (Savard, Bortolod, Truchuck, Lauderdale, & Conroy, 2003).
- Adaptive equipment prescription and home modification (Sanford et al., 2007).

### Evaluation tools

- Functional Reach Test and European Stroke Scale (Parker, Davison, Savard, Gultekin, & Heuser, 2007).
- Kohlman Evaluation of Living Skills and the Canadian Occupational Performance Measure (Dwyer, Dwyer, Shaw, & Wilman, 2001).
- Functional Independence Measure, Jamar Dynamometer, Preston Pinch Gauge, Nine Hole Peg Test, and Unified Parkinson's Disease Rating Scale (Juthman, Rubell-Thompson, Vincent, & Karsus, 2006).

## Intervention

### Key Support Studies

- Stroke (Chunhvir et al., 2010a; Chunhvir et al., 2010b; Kettig et al., 2010; Langhin et al., 2013; Duffin et al., 2007)
- Cerebral Palsy (Kipic et al., 2013; Galamb et al., 2010)
- General Neuro (Hoffmann, 2008; Hugen et al., 2008)
- Multiple Sclerosis (Moa-Morita et al., 2011; Finlayson et al., 2011)
- Acquired Physical Disability (Dortyn et al., 2011)

### Type of technology

- VCT (videoconferencing), Robotic
- VR (Virtual reality)
- POTS (Plain old telephone system), Internet, VCR, RHM (remote home monitoring)
- POTS, Teleconferencing
- POTS

## Key Principals of Telehealth

## Consultation

### Key Studies

- Veterans with traumatic brain injury (Conard, 2007)
- Wheelchair seating consultations between distant and local providers (Schein et al., 2008)

### Technology

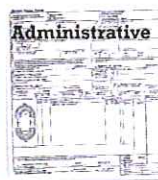
- VCT, RHM
- Customized VCT

## Key Principles in Telehealth Delivery of Care

### Clinical



### Administrative



### Technical



These key principles are to "inform and assist practitioners in providing effective and safe services that are based on client needs, current empirical evidence and available technologies."

A Blueprint for Telerehabilitation Guidelines, Brennan, et al., 2010

## Monitoring (self management)

### Key Studies

- ADLs and Smartphones (Venables, 2000)
- Home exercise programs (Popescu, Burdea, Bouzit & Hertz, 2000)
- Chronic disease management (Darling et al., 2008; Bendixen et al., 2009; Dahlborg, 2011)
- Stroke (Taylor et al., 2012)
- Parkinson's (Patel et al., 2010)

### Technology

- Mobile
- VCT
- RHM, wearable sensors
- VCT
- Wearable sensors

## BEST PRACTICE STANDARDS

- Quality of care
- Informed consent
- Encounter note
- Ethical Standards
- HIPAA/FERPA
- Coding
- Licensure requirements
- Malpractice insurance





### Key Resources for Practice Guidance

- **AOTA Documents**
  - Telehealth Position Paper <http://www.aota.org/American-Occupational-Therapists/Telehealth/Pages/Telehealth-Position-Paper.aspx>
  - Model State Regulations for the use of Telehealth in Occupational Therapy
- **ATA Documents**
  - A Blueprint for Telehealth Rehabilitation Guidelines <http://www.ata-rehab.org/ata-rehab/wp-content/uploads/2014/04/Blueprint.pdf>
  - Various Standards and Guidelines <http://www.ata-rehab.org/ata-rehab/wp-content/uploads/2014/04/Standards-and-Guidelines.pdf>
- **Resources**
  - American Telemedicine Association Telehealth Rehabilitation Special Interest Group <http://www.ata-rehab.org/ata-rehab/wp-content/uploads/2014/04/SIG-Report-3-12.pdf>
  - Telehealth Resource Centers <http://www.telehealthresourcecenters.org/>

## Example of Telehealth Application

## Reimbursement opportunities



### Example of Telehealth Application in ABI

- RR had surgery on July 31, 2011 for a Craniopharyngioma (CPM) located in the center of her medulla. It affected cranial nerves 9 – 12 of brainstem.
- In ICU until moved to rehab Oct. 5, 2011. Discharged from rehab Nov. 30, 2011. Started home health therapy January 2012.
- Lives in remote Alabama, shortage of staffing and lack of neurology specialists.



### Telehealth Single Case Study: Telerehabilitation services in acquired brain injury

## Reimbursement update

### State governments

- **Sixteen states** have already adopted legislation requiring all private payers in the state to reimburse for telehealth for services that would be reimbursed if they were provided in person – expect several more states to be added this year.
- **Expanded Medicaid** - Currently, 14 states provide some coverage for telemonitoring and seven for video-based home care. Look for expanded coverage for several areas including telemonitoring, store and forward studies, telemental health and telehealth in urban areas.

\*Adapted from: <http://www.americanfutures.org/news-landing/2013/01/24/public-policy-for-telehealth-in-2013-it-a-time-for-government-to-lead-or-get-out-of-the-way>

## Study Parameters



- 12 week study (8)
- Secure, encrypted VC technology with TV connect
- External camera for zooming
- iPAD2 for EMR and adjunct capturing of skills
- Interventions include: UE therapeutic exercise, functional activities, transfer training, FM skill, and balance activities.
- Back up technology is Face Time on iPad2 or Skype (occurred twice during study)

## Example of Tele-evaluation

Web or videoconferencing technology between provider and client

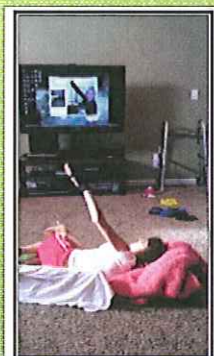


Assessing Functional ADLs

Done in natural environment

## Advocacy/Opportunities

- Involvement in AOTA, APTA, ASHA, etc.
- American Telemedicine Association's Telerehabilitation Special Interest Group (TR SIG)
  - Licensure Portability Sub-Committee
  - Reimbursement Sub-Committee
  - Education Sub-Committee



### Outcome Measures:

SF-36 and 36

Patient Satisfaction Survey

Caregiver Satisfaction Survey

### Findings:

No significant difference overall in self-report levels of wellness

Highly satisfied with telehealth services

Caregiver preferred telehealth services to in-home services

## Networking...

- American Telemedicine Association **Telerehabilitation Special Interest Group** (Telehealth networking via The Hub)  
\*ATA Individual membership = \$220/year
- OT Connections – Technology SIG Forum: Telerehabilitation  
<http://otconnections.aota.org/forums/7352.aspx>
- Occupational Therapy in Telehealth Group Facebook Page:  
<http://www.facebook.com/#!/groups/143754989039036/>  
(Request to join)



## Professional Support

## Questions...





## References

1. American Occupational Therapy Association:  
[www.aota.org](http://www.aota.org)
2. American Telemedicine Association; [www.atmeda.org](http://www.atmeda.org)
3. Association of Telemedicine Service Providers;  
[www.atasp.org](http://www.atasp.org)
4. California Healthcare Foundation; [www.chcf.org](http://www.chcf.org)
5. California Telemedicine & eHealth Center;  
[www.cteonline.org](http://www.cteonline.org)
6. Center for Telemedicine Law: [www.ctl.org](http://www.ctl.org)
7. Federal Telemedicine Gateway; [www.fmgateway.org](http://www.fmgateway.org)
8. Telemedicine Information Exchange:  
[www.tie.telemed.org](http://www.tie.telemed.org)
9. UC Davis Telemedicine Program;  
[www.telemedicine.ucdmc.ucdavis.edu](http://www.telemedicine.ucdmc.ucdavis.edu)

## Telehealth Publications

- <http://www.californiahealthline.org/>
- <http://www.ihealthbeat.org/>
- <http://telerehab.pitt.edu/ojs/index.php/telerehab>
- <http://jtt.rsmjournals.com/>
- <http://www.liebertpub.com/TMJ>
- <http://www.rerctr.pitt.edu/>
- <http://www.hrsa.gov/ruralhealth/about/telehealth/>

## Additional Information:

- "Telehealth Documentation Handbook for Rehabilitation Professionals" Richmond, T.; available for purchase.  
[www.go2care.com/products](http://www.go2care.com/products) or  
[contact@go2care.com](mailto:contact@go2care.com), 310-612-1908
- Online telehealth courses and webcasts.  
[www.go2care.com/education](http://www.go2care.com/education)
- Telehealth consultation, skills training, institution building, program and systems collaborations, opportunity management. Contact:  
[contact@go2care.com](mailto:contact@go2care.com) 310-612-1908