Teleneurology: the future is now

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Disclosures

- No pertinent financial disclosures
Goals

- Understand the role of telemedicine in neurology
- Explore outcomes data supporting its current use
- Discuss future applications of teleneurology
Market forces support telemedicine...

- Aging Population
- Cost Containment Expectations
- Higher Acuity for Hospitalizations
- Changing Regulations
- Pay for Performance
- Consumer Adoption
... but our patient experience drives it

- **Technology** *enables* it
  - Low price points for consumer telemed
  - >80% of Louisianans have access to broadband service*

- **Our patients** *want* it
  - Nearly 75% of US consumers would use virtual health services*

- **Our patients** *need* it
  - Geographic disparity – LA has more population in medically underserved areas than any other state**
  - Lower cost options to offset HDHPs

*http://broadbandnow.com/Louisiana
**SG2, Virtual Visits Update
***http://hrc.nwlc.org/status-indicators/people-medical-outlet/medically-underserved
The dawn of teleneurology...
The dawn of teleneurology...

1905
Einthoven’s EKG transmission by telephony

1920s
Ship-to-shore transmission

1955
The Nebraska Psychiatric Program

1960s
NASA Mercury Health Monitoring Program

1999
The term “telestroke” is coined and reported
RIPPED FROM THE HEADLINES!

2004
Will teleneurology hit the big time?

Personal View
Telesstroke: extending stroke expertise into underserved areas
Dr David C Hess, MD\textsuperscript{a} · \textsuperscript{b} · Samuel Wang, MS\textsuperscript{a} · Hartmut Gross, MD\textsuperscript{a,b} · Fenwick T Nichols, MD\textsuperscript{a} · Christiana E. Hall, MD\textsuperscript{a} · Robert J Adams, MD\textsuperscript{a}

2006

2010
Neurology at a distance
New telemedicine technologies are not only improving neurologists’ access to remote patients and the ability to make diagnoses at a distance, but they are also offering the opportunity to gather anonymous data for research. Ruth Williams reports on assorted innovations in teleneurology and current limitations to their more widespread use.

2011

2013
Teleneurology applications
Report of the Telemedicine Work Group of the American Academy of Neurology

2015
Advantages and Limitations of Teleneurology
Lawrence R. Wechsler, MD\textsuperscript{1}

2017
Teleneurology: Why it Works for Rural Hospitals

Ochsner Healthcare With Peace Of Mind
Where is the urgent need for teleneurology?

- Geographic disparity – nearly half of the hospital in the US have <100 beds
- Most US hospitals do not have neurology on staff – and some rural areas do not have enough demand to keep full time MDs staffed
- Sub-specialty expertise can be scaled
- Patient conditions (health, finance, convenience) limit travel
Drive times from New Orleans (4, 5, & 6 hrs)
Hub and Spoke Model

“Spoke Hospitals are able to reduce transfer costs, keep more patients in house, and increase patient satisfaction and quality of care” – Advisory Board

Value Proposition by Type of Facility

**Spoke**
- Reduce Transfer Costs
- Keep more patients in-house
- Increase quality of care quality and patient satisfaction

**Hub**
- Increased Market Share
- Stronger ties with underserved populations
- Possibility of receiving more advanced transfers

**Health System**
- Leverage specialist expertise at outlying facilities
- Keep patients within system by reducing transfers, improving satisfaction
Various considerations for teleneurology

- Emergency services
- Inpatient consultations
- Outpatient consultations
- Patient direct services (facility or home-based)
- Store and forward interpretation
- Patient outreach and research recruitment
Making the investment...

Support team identification Guide

Computer Software
Components and Support Process
- Dell PC hardware
- Associated PC software
- All computer software and hardware is supported by the desktop development team.

External Devices
Components and Support Process
- Jed Med Camera
- Think Labs Stethoscope
- Extron Switcher

All external devices are supported by Visual Technology Services
Emergency services - TeleStroke

ED Physician evaluates patient
- Initiates order set
- Orders TeleStroke Evaluation

RN puts on monitor, initiates IV, and draws labs
- Patient to CT Scan
- CT Scan sent to TeleStroke cloud

RN Registers Patient in TeleStroke System
- RN Initiates TeleStroke Consult and Facilitates Physical Exam

Stroke Team MD assesses patient, Reviews CT Scan, and Makes Diagnosis
- Stroke MD makes treatment and transfer recommendations
- Formal Consultation note completed for patient record.
Emergency services - TeleStroke

- Telestroke 2.0 (U.S. 2009)
- AAN Working Group (2013)
- TRUST-tPA trial (France, 2015)
- Victorian Stroke Telemedicine (Australia, 2015)
- Ochsner experience (2009-present)
TeleStroke

Consult Volume by Year
>7,000 Patients Served

Network Door to Needle Time

Use of Clot Busters
3,246 Acute Strokes Diagnosed

Patient Retention Rates
Inpatient consultation – General Neurology

CALL

TRIAGE PROVIDER-TO-PROVIDER

URGENT TRANSFER

SCHEDULED TELE-ROUNDS
Inpatient consultation – General Neurology

- “Specialists on Call” (50,000\textsuperscript{th} patient, 2012)
- Epilepsy care in Canada (2013)
- Ochsner experience (2013, 2016)
Outpatient consultations / patient-direct

- Parkinson’s disease
  - Dorsey studies (2009-2015)

- Dementia

- Headache
  - Telematic 2nd opinions, EHF (2010)

- Epilepsy
  - Store and forward EEG, Arkansas study (2015)
Research and education

- Resident and fellow
  - Tele-supervision
  - Didactics
  - Prepared for the future

- Patients
  - Web-based education
  - Support groups
  - Research trial recruitment
Why consider? *Benefits of teleneurology*

- Increased practice outreach, development and efficiency
- Decreased travel time and cost for providers and patients
- Expansion of professional and patient education
- Clinical trial recruitment
- Improvement in access and reduction in geographical disparity / hospitals keep their patients local
- Improved response time for neurological emergencies
- High patient and family satisfaction

Be prepared! *Challenges of teleneurology*

- Disruption of traditional patient-doctor relationship
- Provider reluctance to adapt
- Limitations to billing and reimbursement for time spent
- Additional start-up costs
- Additional licensing and credentialing issues
- Concern for malpractice liability
- Limitations to detailed neurologic exam & paraclinical data

What is the future of teleneurology?

- More outcomes data is needed
- Larger network relationships will form
- International collaborations are attractive
- Parity of reimbursement is necessary
- "Uberization" of healthcare = greater acceptance by providers, patients, and payors
THANK YOU