Agenda

Welcome
Danielle Lazar, MA, Executive Director Urgent Matters

History of Telemedicine
Robert L. Galli, MD, Professor of Emergency Medicine & Internal Medicine & Executive Director of the Office of Telemedicine: TelEmergency at the University of Mississippi Medical Center

Telemedicine in Rural Settings
Elda Ramirez, PhD, RN, FNP-BC, FAANP, Associate Professor at UTHealth Houston Texas

Robert L. Galli, MD, Professor of Emergency Medicine & Internal Medicine & Executive Director of the Office of Telemedicine: TelEmergency at the University of Mississippi Medical Center

Specialty Telemedicine
Hartmut Gross, MD, FACEP, Professor in the Department of Emergency Medicine & Department of Neurology, Co-Investigator on the REACH Telesstroke Project at Medical College of Georgia, Georgia Health Sciences University

Technical Support
Call Webex directly at 1 (800) 985-9074 and press #2 for technical support
Telemedicine

Any tool that seeks to improve a patient’s health via a two-way, real-time communication between a patient and physician or practitioner at a distant site.
Health IT: Information-driven health practices and the technologies that enable them. Includes billing and scheduling systems, e-care, EHRs, telehealth, and mobile health.

E-Care: The electronic exchange of information—data, images, and video—to aid in the practice of medicine and advanced analytics. Encompasses technologies that enable video consultation, remote monitoring, and image transmission (“store-and-forward”) over fixed or mobile networks.

EHR: An electronic health record is a digital record of patient health information generated by one or more encounters in any care delivery setting. Included in this information are patient demographics, progress notes, diagnoses, medications, vital signs, medical history, immunizations, laboratory data, and radiology reports.

Telehealth: Often used as a synonym for e-care, but includes non-clinical practices such as continuing medical education and nursing call centers.

Mobile Health: The use of mobile networks and devices in supporting e-care. Emphasizes leveraging health-focused applications on general-purpose tools such as smartphones and Short Message Service (SMS) messaging to drive active health participation by consumers and clinicians.
Three Functional Categories

- **Store and Forward**
  - “asynchronous” communication, patient data/images captured, stored, forwarded

- **Remote Monitoring**
  - Sensors to monitoring equipment data sent real-time or store and forward

- **Real-Time Patient Management**
  - “Synchronous” communication, streaming video/audio
History

• Military and University- beginnings over four decades ago
• 1980’s- digital communication expansion
• Early Applications- EMS, ECG Telemetry

(Zachariah, Pepe 1997)
Challenges

- Cost
- Privacy
- Reimbursement
- Network Logistics (Zanabomi, Wooten, 2012)
- Oh Yeah & Providers
However,

• High Speed, Cost Effective Technology
  – 3G, 4G, LTE
• Greater Definition on Reimbursement Policies
• Awareness of Successful Models with Effective Outcomes
Advanced Practice Providers (NP/PA) in Rural American Emergency Departments: The Telemedicine Experience

Elda G. Ramirez
PhD, RN, FNP-BC, FAANP
Associate Professor Clinical Nursing UTHealth – SON Houston, TX
Nurse Practitioner in Emergency Care
Memorial Hermann TMC/Lyndon Baines Johnson/ Ben Taub
Objectives

• Define NP/PA roles
• Identify utilization and State regulation/variation for NP/PA to practice in rural ED’s
• Discuss funded NP program to support rural ED trained NP’s in early 2000’s
• Examine outcomes of program
• Clarify preparation for providing care in rural areas
• Hiring NP/PA’s into your practice
Nurse Practitioner/Physician Assistants
APP’s

• PA - Physician Assistant
  – under physician supervision, carry prescriptive authority under MD all states. Certification available post graduate from PA school.

• NP - Nurse Practitioner
  – Some States independent provider other States physician supervision. Certification underdevelopment ENA and ANCC.
Providers in underserved areas

• NP/PA have existed since 1965
• Primary purpose of roles were to support underserved areas
• Physicians had a large role in education and placement of NP/PA
Grant Availability HRSA

• In the early 2000 based on Health People 2010 Goals - Access to care was critical

• As one of the only NP programs with an emergency focus in the nation we worked with a local group of EM physicians who were providing telemedicine in rural Texas emergency departments and wrote a grant to educate providers for that service
How it worked

• NP students training: (many students came from the rural areas they would later serve)
  – Procedures (Robert’ & Hedges) Cadaver labs
  – Didactic content (Rosen’s, Tintinalli)
  – Clinical (800 hours total)
    • Family, women’s health, pedi, urban ED, rural ED with telemedicine providers
    • The physician group had pick of students
Funded Project

Outcomes

• Students evaluated the rural experience anecdotally as “slow” but really exciting when it got busy

• Working with technology was cumbersome at that time when a camera was attached to a rolling cart!
  – The technology was just taking off
Outcomes

• The MD’s they worked with were supportive and satisfied with the outcomes of the education program. One of the most important comments was “they knew when they needed help”

• Risk management wise there were no known cases of litigation for negligence or malpractice
Difficulty!

- The rural MD’s that were the back up in the community were less supportive.
- Hospital risk management/administration were highly concerned with skill and liability of providers.
- Billing.
- Equivocal pay to urban ED’s and competing Emergency Physician groups.
- NP/PA representation in administration of physician group.
What does it take?

• NP – master’s or doctor of nursing practice licensed nurse practitioner in state, certified in FNP-Acute care (only adult) - pedi only

• Trained in emergency care or on the job training, CEU that would satisfy hiring body

• Studies show that new graduate NP’s need a good year to stabilize and gain confidence

• Just because they worked in the ED as nurses does NOT make them a strong NP!!!!!
What does it take?

• PAs must be authorized by the state (licensed, certified or registered) before they can begin practice

• There is an emergency certification post PA program completion

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Email: aapa@aapa.org-www.aapa.org
Hiring NP/PA into an Emergency Practice

- Billing
- Supervising rules per state
- Hospital delegation of privileges and bylaws
- Continuing education and competency evaluation
- Regulated peer review by profession
- Technology skills
Rural Health Care - A Perennial Challenge

- Access
  - Facilities
  - Personnel
- Finance
Number of EM Physicians

- 3,964 Emergency Departments in 2010
- In 2005:
  - 22,000 were board certified
- Need about 40,000 to staff fully
The Mississippi Problem

- There are not enough Board Certified Emergency Medicine specialists to service most of the rural hospitals in Mississippi
- Unlikely to change in near future!
New Problems

• Balanced Budget Act
Medicare’s Critical Access

- Be a rural or nonprofit hospital
- Located more than 35 miles from any other hospital
- Available 24hr Emergency Care Service
- 25 inpatient beds
- Strict Staffing Requirement
- Limit to 96 Hour Admits
The Key: Access

- 24° access = Emergency Services
ED Staffing - 4 Levels

- Level 1 - Academic Center
- Level 2 - Larger Cities
  - Baptist, Forest General
- Level 3 - Rural “Cities”
  - Grenada, Greenville
- Level 4 - Delta Rural Health Network
Problems for Level 4’s - Recruitment

- Attracting Doctors
- Affording Doctors
The Nurse Practitioner Approach
Problems

- Acuity
- No Back-Up
A New Approach

• Use What’s Already There
Nurse Practitioner

- University Emergency Medicine
- Technology
TeleEmergency
Benefits

- Patient Care
- Cost
- Education
- Supervision
- Supervision
- Supervision
The Golden Hour

- We Never Sleep!
Issues - Teaching

- Post Certification Education
- Cameras
- Links
Issues - Funding

- Business Plan
  - NP Billing
  - MD Consultation Fee
  - Grants
Issues - Medical

- Medical Board
- Nursing Board
- Hospital Board
Progress

- Operation began October 1, 2003
- Approximately 1,500 patients per month
- 15 hospitals in operation
- Over 300,000 patients seen to date
Patient Satisfaction

- **93.6%** of patients were comfortable or very comfortable with the system
- **98.7%** never had difficulty seeing or hearing the UMC physician
- **87.3%** felt their care was as good or better than with an MD alone
Patient Satisfaction

- **91.2%** of patients are more likely to come back to the rural ED because of TelEmergency

- **85.6%** rated their overall care as good or excellent
Administrator Satisfaction

- 100% feel level of care in their ED has increased or remained the same
- 87.5% feel it costs less or the about same
- 85.7% feel that their overall ED volume has increased
Administrator Satisfaction

- 85.7% feel their number of admissions have increased
- 87.5% are not concerned at all about a technical failure of the system
- 87.5% have an overall good or excellent opinion of TelEmergency
Coding

- Average chart value with local coders:
  - $117.51
- Average chart value with PRCS:
  - $225.18
- 52% increase
  - Range of 28% - 182%
Electronic Medical Record

- 300% increase in billing at UMC
- Electronic medical record installed at 8 sites
- Preliminary numbers show increased documentation and a 9% increase in billing (1 site/1 NP only)
- Will aid in PI
Staffing

- All MDs through staffing company: 
  - $70,370 per month
- TelEmergency NPs / MD combination: 
  - $50,871 per month
- TelEmergency NPs /only: 
  - $42,522 per month
Challenges

- Increased length of stay
  - NPs
  - Consulting
- Hospitals do their own scheduling
- NPs practicing with local backup
NP Consulting

- NPs are required to consult on “level 1 or 2” diagnoses
- Approximately 56%
- Consult protocols in place

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<tr>
<td>Nose</td>
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<td>Other</td>
<td>0.22%</td>
</tr>
<tr>
<td>CPR</td>
<td>0.22%</td>
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Performance Improvement

- 25 charts from each site reviewed each quarter
  - All NPs
  - All deaths
  - All schedule II/III controlled substance use
  - At least 25% of schedule IV/V use
TelEmergency Benefits

- Decreased staffing costs
- Increased billing
- Increased patient satisfaction
- Increased administrator satisfaction
- Increased level of care
FOR MORE INFORMATION:

http://www.umc.edu/telemergency/

601-815-1787
Telemedicine Stroke Application

REACH System

Hartmut Gross, MD, FACEP
Professor of Emergency Medicine and Neurology
Medical College of Georgia /
Georgia Regents University
Joint Commission Advanced Comprehensive Stroke Center
Telemedicine Historic Perspective in GA

• Began approx. 1990
• Point to point system
  – Dedicated specially painted rooms
  – T1 phone lines
  – Room full of equipment and tools
  – Hard to find all the “On” switches
• Driving mindset: What else can be added?
Telemedicine Historic Perspective in GA

• System received little use
  – Scheduled appointments on each end
  – Expensive to set up, maintain, and use
  – Disrupted physician work flow on both ends
  – Intimidating and difficult to use on both ends

• Nice video and fine diagnostic quality
Why Telestroke? The Stroke Belt
Why Telestroke?

• Chart review revealed doughnut referral pattern
• Many acute stroke patients being transferred in and arriving just past time window for tPA
• Occasional request for tPA assistance from OSH
• “If I could just see the patient and the CT,...”
Why Telestroke?

- One task and do it well, then expand as needed
- Simple
- Streamlined
- Fits physician and staff work flow
REACH (Remote Evaluation of Acute isCHmic stroke)

- Small team of Neurologists, 1 EM MD, nurse, computer programmer, and businessman
- Single platform integrating
  - 1 (later 2) way video
  - CT scan with DICOM reader
  - H&P format to provide full consult
  - NIHSS calculator
  - Weight based tPA orderset calculator
  - Follow-up recommendations regardless of tPA recommendation
REACH

- Wireless mobile cart in ED (hospital floor)
- Consultant end user driven camera
- Web based – Consultant can be anywhere there is wired or wireless network
  - Marcus Welby
- Secure
- Hub and spoke system using drip and ship model
SCREEN SHOT:  STROKE SCALE ASSESSMENT
Patient: Chesterfield, Paul G
Consulting Physician: Grant Kohler
MR#: 9876501234

Start: 14:35 2 Oct 2011

Stroke - Urgent Consult Note

CONSULT BACKGROUND AND SUMMARY

Patient Demographic Information
Patient: Paul G Chesterfield
DOB: 22 Jun 1943 (68y)
Race: White
Gender: Male

Consultant Information
Grant Kohler

Hospital Information

Reason Consult Requested:
Patient presented with a CC of not being able to see in the leftward direction and a slight headache. Denies dysarthria, weakness or numbness.

Requesting Physician:
Marc Watson

Treating Physician:
Marc Watson
IPA Recommended: Yes

Times and Targets
In ER Door: 14:10 2 Oct 2011
ER Doc Seen: 14:15 2 Oct 2011
Sent to CT: 14:17 2 Oct 2011
CT Read: 14:30 2 Oct 2011
Last Known Well: 13:40 2 Oct 2011
Time tPA Given: 15:06 2 Oct 2011
Door To Needle: Unknown
Onset To Needle: Unknown
Door To CT Start: 20min
Consult Start: 14:35 2 Oct 2011
Consult End: 14:35 2 Oct 2011
REACH Testing

• Published trials to validate
  – Bedside vs remote NIHSS accuracy and speed
  – Accuracy of CT scan read by radiologist vs REACH system and REACH physician
• Stability of integrated platform
The REACH success story 2000 ->

- Trial rollout at one nearby rural ED
- Several hour presentation to hospital administrators, physicians, staff, EMS and media
- 9-5 weekday activation to test and workout flow in the real world
- Onsite training (all shifts)
- Assistance with development of protocols/guidelines
The REACH success story 2002 ->

- Go live 24/7/365
- Within 2-3 months, neighboring rural EDs request access
- Progressively more rural EDs want in
- ED MD, nurse and computer specialist on road trips to install and train, upgrade and retrain as needed.
The REACH success story 2002 ->

- Local media hails this as providing same care in the hometown hospital as you can get far away in the big city
- Restores faith in the small hospital
- Rural hospital and pt/family determine if and where to transfer
- Assurance that patient will always be accepted at hub, if desired, even if it is not a stroke
The REACH success story 2002 ->

• REACH had a number of journal publications
• One commentary:
  – *Telemedicine for stroke is just a flash in the pan. Just fly ‘em to the hub and treat ‘em there.*
• We looked and found an average 90 minute “rural time penalty” for being flown
• Our rebuttal:
  – “Our electrons are faster than your helicopters.”
The REACH success story 2005 ->

• Up to first 9 spokes with departmental funds and pro-bono consultation
• Improved patient outcomes
• Shorter hospital stays
The REACH success story 2006 ->

• Health Department from New York requests REACH installs a statewide telestroke system

• A company is born with institutional support from Medical College of Georgia
REACH 2013 across the US
REACH Customers

Northwestern Memorial Hospital
OhioHealth
Ohio State Medical Center
Ochsner Health System
GRU - Georgia Regents University Augusta
Penn State The Milton S. Hershey Medical Center
Penn Medicine
MUSC St. Mary's Health Care System
St. Joseph's/Candler
Tenet
Palmetto Health
Piedmont Hospital
Premier Health Partners
CHS
University of Rochester Medical Center
St. Dominic's
Sacred Heart Health System
Catholic Health Initiatives
HCA
State University of New York Upstate Medical University
Barnabas Health
Kaleida Health
REACH 2013 across GA
Covering the Stroke Belt

REACH 2013 across GA and SC
REACH Integration in GA

• Many small, rural hospitals with few resources
  – No EM, radiologist, neurologist, ICU
  – Critical Access hospitals
• Large hospitals with no neurologists
• Large hospital with on-site neurologist support 9-5 weekdays
REACH Support in GA

• Many hospitals are supported by the hub in good faith and maintaining long term referral base for stroke as well as other illness

• Other large hospitals
  – Cost of cart and use and maintenance (24/7/365) based on ED volume
  – Payment for on-call availability

• Payment for consults provided.
REACH for Research in GA

• Research tool
• Can have staff awaiting patient at hub for enrollment into studies
• Enlist patients for research studies at rural site
REACH Expansion

• Cart sitting there not always in use
• New modules created based on requests from customers.
  – Psychiatry
  – Post arrest hypothermia
  – ICU
  – Trauma
  – Many more
• Do one thing and do it well before expanding
REACH Expansion

REACH ACCESS™ PLATFORM

- URGENT STROKE
- STROKE CARE
- MOVEMENT DISORDER
- CONCUSSION
- RESPIRATORY DISTRESS
- VENT MANAGEMENT
- VENT WEANING
- ACUTE STRESS REACTION
- DEMENTIA
- CHEST PAIN / ANGINA
- CARDIAC ARREST
- ARRHYTHMIAS
- GENERAL CONSULT

NEUROLOGY

PULMONOLOGY

PSYCHIATRY

CARDIOLOGY
Many Other Systems Address Other Issues

- Tele-Emergency
- Tele-Stroke / Tele-Neurology
- Tele-Trauma
- E-ICU
- Non-Traditional
  - Military Telemedicine (Trauma) application
  - Maritime
  - Direct patient to MD tele-consult
Starting Telemedicine

• Identify a problem
• Time sensitive
• Lack of expertise
• Can telemedicine provide the solution?
Things We Did Well

• Onsite training by ED MD (3 exceptions)
  – Knows how people work and the flow in an ED
• Consult group that works together well
• 24/7/365 with formal on call schedule
• Communication Center coordinating and recording calls
• Learn unique needs of site and help fulfill them
• Teach with each consult – decreases false alarms
Things We Did Well

• Newsletters
• Conferences at hub
• Patient follow-up
• Incentive pins
  – EMTs, nurses, MDs
• Word of mouth propagation
BE STROKE SMART
AND HURRY!
How **NOT** to Implement Telemedicine

- Just drop off telemedicine equipment without education or training
- No on-site face time by at least one consultant
- Can’t find on call consultant or long response delays
- Use learners (residents)
- Red light / green light
How NOT to Implement Telemedicine

• Ignore the spoke, especially if rare activation
• Berate the staff/MD for misdiagnosis and false alarms
• Make the system cumbersome or disrupt flow and use lots of staff / MD time
• Don’t provide help/support (spoke or hub)
How NOT to Implement Telemedicine

• Don’t get consulting privileges
• Don’t leave a note for the medical record
• Allow the hospital to implement a system without notifying or getting buy in from the ED
• Implement something no one wants or needs
  – E.g. Trauma pilot project failure
Telemedicine Success

• The people at both ends
• Keep software and hardware easy / simple
• Follow the workflow
• Patient follow-up / outcomes
Telemedicine Success

• Ongoing support
  – Computer
  – Guidelines
  – Order sets
  – Retraining
  – Teaching
  – Updates
• Dedication