The Road to a Teleaudiology Program - Bumpy, But Worth the Journey

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Why try Teleaudiology?

1 – 3 – 6 Data for the counties included in the Teleaudiology Project

- Fewer babies are diagnosed by 3 months of age
- Higher lost to follow up rate than the rest of the state

Many babies in some areas are going out of state for services

Way of the future!
Characteristics of These Areas

- Extremely rural
- High percentage of the population is below poverty
- The 17 infant diagnostic sites are not easily accessible
  - 5 hours drive time one-way
  - Involve taking a ferry
Ferry Announcements

**Monday, September 19, 2011**: CEDAR ISLAND-OCRACOKE ROUTE WILL MISS TWO RUNS WEDNESDAY

**Sunday, September 18, 2011**: CURRITUCK-KNOTTS ISLAND FERRY SUSPENDED DUE TO LOW WATER

**Monday, August 15, 2011**: SWAN QUARTER-OCRACOKE FERRY ROUTE TO RUN AMENDED SCHEDULE TUESDAY AND WEDNESDAY
Northeastern Counties

Most families from northeastern counties are going to Virginia for diagnostics

- Medicaid coverage
- Continuity of care
- Tracking issues
Our Teleaudiology Project Goals

To provide infant diagnostic evaluations in rural eastern and southern counties

To establish a coordinated system for the delivery of audiological evaluations for infants whose families experience economic and geographic barriers to service
What We Want to Accomplish

Decrease drive time for families to no more than 2 hours

Increase the number of children diagnosed by 3 months

Decrease LTFU
Preparation Process

Establish a partnership
Develop a contract
Purchase equipment
Develop protocols, guidelines and sample scripts
Approval from NC Board of Examiners for SLPs and Audiologists
Ensure training
Visit sites to get “buy in”
Establish a Partnership

**EHDI Program**
- The money
- An audiologist for pilot project
- Babies
  - not currently being diagnosed by 3 months

**East Carolina University (ECU)**
- Established telemedicine program
- Audiologist experienced doing infant diagnostics
- Interest
Develop a Contract with ECU

Department of Communication Sciences
- Protocols for audiological evaluation
- Obtain sanction from the NC Board of Examiners for Audiologists
- Provide diagnostic evals via telemedicine system

Telemedicine Center
- Technical support
- Training
- Scheduling
Purchase Equipment

Audiological Equipment
- Diagnostic ABR
- Diagnostic OAE
- 1000 Hz Tympanometer

Match what ECU would be using

Portability
Develop Protocols

Audiological

Telemedicine

Teleaudiology Intake
  From Rescreen to Diagnostic
  Q & A sheet for parents
  Teleaudiology Request Form
  Checklist
Approval from NC Board of Examiners

ECU Contract

Public Hearing – developing rules for tele-practice

Protocols developed

Chair of ECU Dept. of Communication Sciences
Training

Hospitals

Audiologists with the child and at ECU

Telemedicine equipment

Teleaudiology site coordinators
Remote Site Visits

Check equipment

Introduce audiologist on-site

Work out site – specific details

Credentialing
Preparation Process

Establish a partnership
Develop a contract
Purchase equipment
Develop protocols, guidelines and sample scripts
Approval from NC Board of Examiners for SLPs and Audiologists
Ensure training
Visit sites to get “buy in”
First Appointment

February 1, 2011

About 9 months later than we had hoped

Telemedicine equipment didn’t connect

OAE and tympanometry
Lessons Learned

Everything will take more time than you expect

Work directly with the person involved

Protocols evolve as the program develops

Need is not as great as it appears on paper
  Babies with multiple concerns
  Established patterns of care

The non-technical part is generally the most challenging
Well, well - it seems your weight is perfect. You just happen to be eleven feet too short.
Future Plans

New site in Robeson County

Determining sustainability
  Billing

Non-audiologists for the remote sites
  Grad students?
  Hospital personnel?
ECU Telehealth Mission

Improve health care quality & access by appropriate application of health information & communications technologies and practices

in Eastern Carolina

across our nation

and outreach to other nations worldwide.
Current ECU telehealth applications

- **Teleconsultation/Specialist Referral Services**
  - patient accompanied by a presenter who’s at a clinical site equipped with peripherals collaborates with a MD or other consultant at a center of medical expertise

- **Distance learning and distance education**
  - lecturer or instructor who delivers presentation materials to multiple locations for courses, grand rounds, or continuing education, may need to support student/participant Q&A. May be focused on adult health education/health literacy.

- **Multi-specialty health care collaboration**
  - subspecialists at multiple locations collaborating on single case or groups of cases, e.g. tumor board, to discuss treatment options; physician to physician collaboration

- **Patient interview/follow-up/compliance/education**
  - direct communication with a patient and/or care giver in situ (e.g. home care) for following up on problems related to a known diagnosis, ascertaining compliance with treatment plans, and/or patient education

- **Meetings/Administrative**
What is telemedicine?

Telemedicine is the use of medical information exchanged from one site to another via electronic communications to improve patients' health status. Closely associated with telemedicine is the term "telehealth," which is often used to encompass a broader definition of remote healthcare that does not always involve clinical services.

Videoconferencing, transmission of still images, e-health including patient portals, remote monitoring of vital signs, continuing medical education and nursing call centers are all considered part of telemedicine and telehealth.

Extracted from CMS website and the American Telemedicine Association 2010

Telemedicine is not a medical specialty
ECU Telemedicine History

- First consults with State Prison in 1992 – Consult # 00001: Vascular surgery
- Expansion of existing distance education network to cover residency program and first clinical rooms in rural hospitals -1994

“Go ahead and tee off. Then I want you to listen to this wheezing”
ECU Telemedicine history

Research & Development

- “Tele” diagnostic tools
- Physician work stations –
  from home to office

- Technical interface development for IP technologies with video tools - WFU/ECU – IP stethoscope
- Development of requirements for distribution of specialty care- dual inputs- EMG audio/video (and now Audiology)
- Telecommunications varieties, wireless, cable, cell, etc.
ECU Telemedicine History

- Established Advanced Telemedicine Training with more than 600 attendees representing 28 countries since 1997
- Awarded “Center of Excellence” status by University of North Carolina General Administration in 1999, renewed 2004 & 2009
ECU Telemedicine History

- Research in Disaster Relief and Bioterrorism Exercises since 1998
- Flood waters consume Eastern North Carolina homes and businesses in 1999
Connected health?

- **Telehealth/Telemedicine**
  - Specialty teleconsultation
  - Telecare
  - Remote monitoring
  - Distance learning
  - Multidisciplinary care

- **Health Information Technology**
  - Electronic Health Records
  - Practice management systems
  - Clinical decision support
  - e-Prescriptions
  - Alerts/reminders
  - Digital imaging/PACS

- **Consumer Health Informatics**
  - Personal Health Records
    - Health web sites
    - e-Visits
    - e-Journals
  - Virtual health/support communities

Common denominator is the *network*
Basic Telemedicine Types

- **Interactive** (Synchronous)
  - Two way video, real time
  - high-bandwidth telecommunication

- **Store and Forward** (Asynchronous)
  - Images, audio or video files stored and transmitted, like e-mail, usually not real time
  - lower bandwidth telecommunication
Typical patient site

- Medical Specialty Driven
- Additional switch or inputs for video sources or tools
  - Otoscope
  - Derm camera
  - Ultrasound, other aux.
- Stethoscope
- PC interface for imaging storage or sharing

Robert Hoyer, MD  Dept of Pediatrics and resident at School for the Deaf  in Wilson, NC residency school
The Telemedicine Center

Ahoskie – Roanoke-Chowan
Jacksonville – Onslow
Kenansville – Duplin General
Tillery-Community Ctr
Rocky Mount -Nash
REACH Network
Rural Eastern Carolina Health – Network

Telemedicine Clinical Sites
Belhaven - Pungo District Hospital
Tarboro - Heritage
Tarboro-Heritage Heart
Wilson - School for Deaf
ResCare- Wilson-
Raleigh – Women’s Correctional
Butner- Central Regional
Morganton- School for Deaf
Taylorville- Alexander Correctional
Goldsboro - Cherry Hospital
Goldsboro – Goldsboro Pediatrics
Faison - Goshen Medical Ctr
Kenansville – Duplin General

Gray lettering is Proposed 2011

Sites with Nurse Presenters
Sites with Trauma Rooms
Cardiology Network
Psychiatry Network

SOLID –Windsor
Greenville – Heart Institute
Greenville –HealthSteps
Greenville-ECU Psychiatry
BSOM UHS

Belhaven - Pungo District Hospital
Avon - HealthEast Family Care
Ocracoke-Ocracoke Health Center

Wilson - School for Deaf
Taylorsville- Alexander Correctional
Morganton- School for Deaf
Butner- Central Regional
Raleigh – Women’s Correctional
Raleigh – Central Prison
Raleigh-Governor Morehead School for Blind
Goldsboro- Cherry Hospital
Goldsboro – Goldsboro Pediatrics
Faison - Goshen Medical Ctr
Kenansville – Duplin General

Hospital Site
Medical Center Site
School Infirmary Site
Correctional Sites

REACH Network
Rural Eastern Carolina Health – Network
Telemedicine Clinical Sites
IP advantages

- IP already part of your existing network using HIPAA protocol
- Can serve multiple applications
  - Electronic medical record
  - Internet interface – E-prescribing, medical info transfer
  - Personal workplace
  - E-mail
  - Telemedicine with encryption within VC unit/software
- Allows use of varying types of internet/telecom providers

Dr. Mariavittoria Pitzalis connects from her office to outpatient clinic in regional Cardiology Rehabilitation Center.
New mobile Models

- HD codec, camera, and display
- Cart allows adjusting heights
- Stereo Microphone
- Increased Audio Frequency range (up to 22kHz)
- UPS
- Mobile
- Network/Power connectivity
- Video instruments
- Interoperability?
- Electronic stethoscope
- Video switcher for Auxiliary inputs including ultrasound
- Content Sharing
- Multipoint

ECU HD unit 2007
ECU Provider Technical Configuration

- Polycom HDX with document sharing
- Pan/Zoom/Tilt camera w/far-end control in Patient Room
- PIP layout control
- Directory Dialed
- Up to 6M calls
- Mobile desktop capability
- Telemed unit also used for Distance Educ
- Dual audio/mic

Dr. Andy Stuart talks with Mother and Audiologist in Elizabeth City

The Telemedicine Center
Patient End Units

- High Definition codec/camera with PTZ capability
- Mobile cart allows adjusting heights on a small footprint
- AES encryption for HIPAA compliance;
- Video switcher for Auxiliary inputs including ultrasound
- Content Sharing with laptop/audiology test equipment
- UPS; provisioned for wireless
- Network/Power connectivity
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