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

Kathleen Watts, M.A., Program Manager

Early Hearing Detection & Intervention, NC Division of Public Health

Gloria Jones, R.N., Clinical Telehealth Manager

Andrew Stuart, Ph.D., Professor

East Carolina University

Why try Teleaudiology?

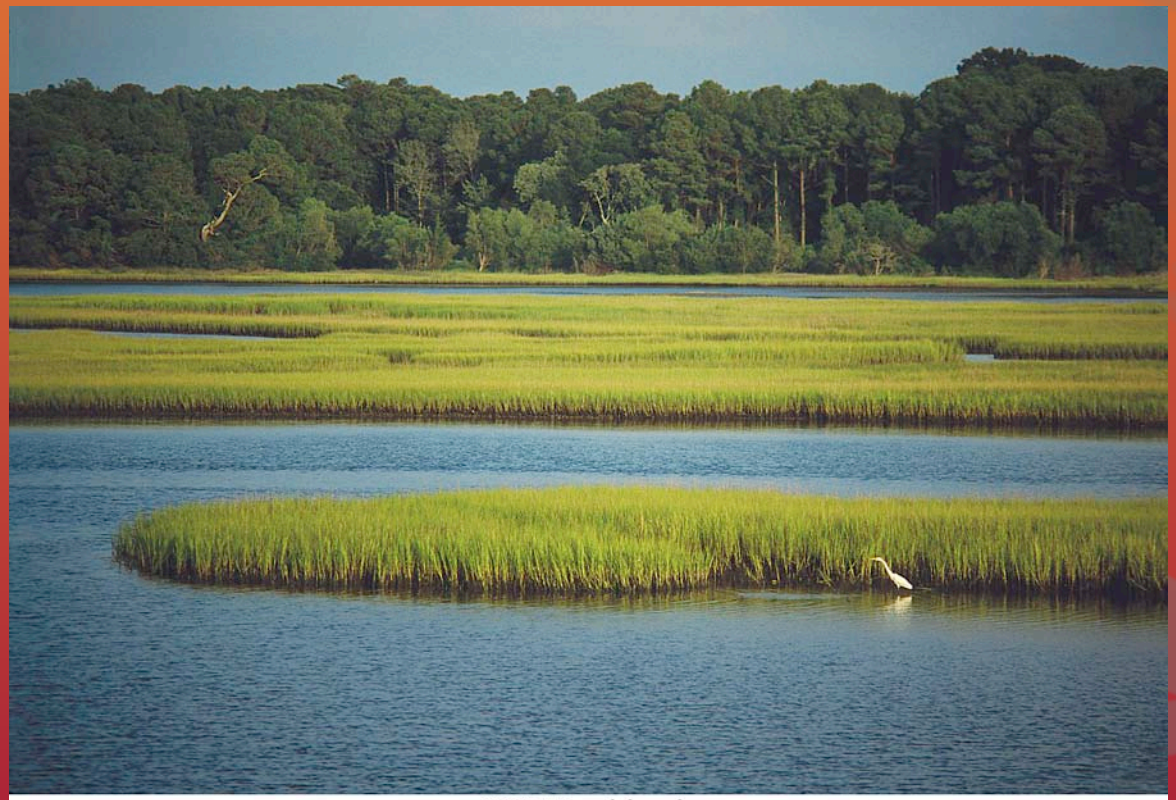
1 – 3 – 6 Data for the counties included in the Teleaudiology Project

- 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!


© Nations Online Project
WEST VIRGINIA
KENTUCKY
VIRGINIA
MD
TENNESSEE
GEORGIA
SOUTH CAROLINA
ATLANTIC OCEAN
GREAT SMOKY MTS
BLUE RIDGE
Chesapeake Bay
Dismal Swamp
John H Kerr Res
Albemarle Sd
Pamlico Sound
Onslow Bay
Long Bay
Cape Hatteras
Cape Lookout
Cape Fear
Mount Airy
Roxboro
Reidsville
Oxford
Henderson
Roanoke Rapids
Elizabeth City
Edenton
Nags Head
Manteo
Boone
Winston-Salem
Greensboro
Burlington
Durham
Rocky Mount
Tarboro
Williamston
Lenoir
High Point
Chapel Hill
Mt Mitchell + 6684
Catawba R
Statesville
Lexington
Cary
Raleigh
Wilson
Greenville
Washington
Hickory
Salisbury
Asheboro
Waynesville
Asheville
Kannapolis
Concord
Sanford
Smithfield
Goldsboro
Forest City
Gastonia
Albemarle
Pee Dee R
Murphy
Franklin
Hendersonville
Shelby
Charlotte
Southern Pines
Dunn
Kinston
Fayetteville
New Bern
Monroe
Rockingham
Clinton
Atlantic
Laurinburg
Jacksonville
Cape Fear R
Lumberton
Morehead City
Whiteville
Wilmington
NORTH CAROLINA
POPULATED PLACES
500,000 – 999,999 • Charlotte
100,000 – 499,999 • Greensboro
25,000 – 99,999 • Asheville
24,999 and less • Edenton
State capital ★ Raleigh
TRANSPORTATION
Interstate; limited access highway
Other principal highway
Railroad
Ferry
PHYSICAL FEATURES
Streams
Lakes
Highest elevation in state (feet) +6684
MILES
0 25 50 75 100
Albers equal area projection



NC Marshland

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


ROANOKE

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.
LEE331
©2005 Vic Lee. Dist by King Features Syndicate, Inc.

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

Dr. Dawd Siraj with John Hopkins University connecting to Ethiopia

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?

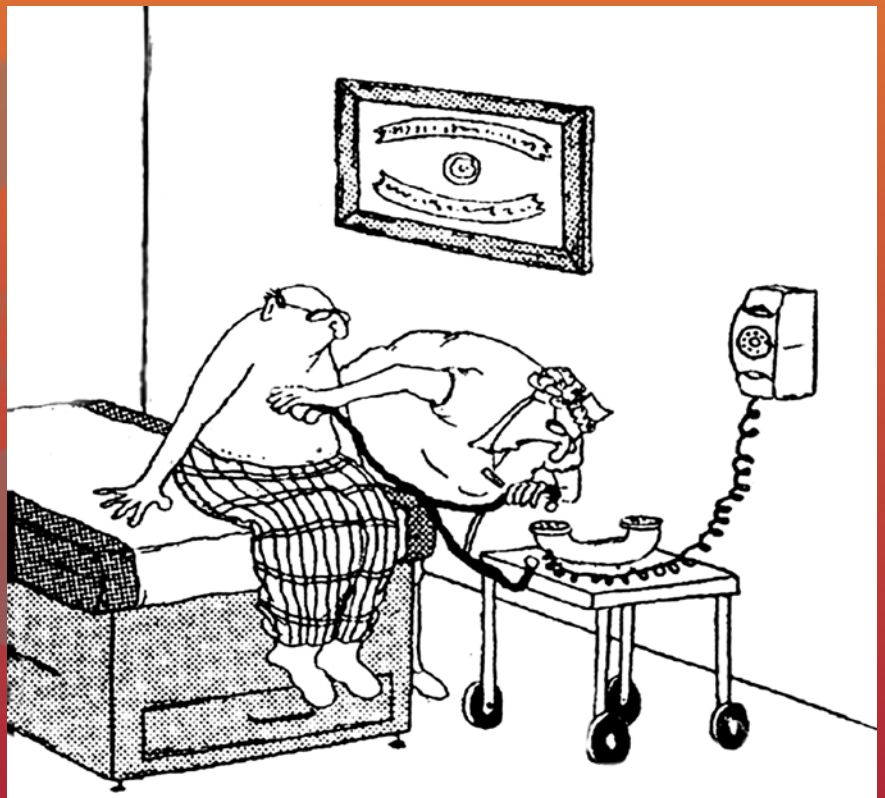
Telemedicine is the use of medical information exchanged from one site to another via electronic communications to improve patients' health status. Closely associated with telemedicine is the term "telehealth," which is often used to encompass a broader definition of remote healthcare that does not always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



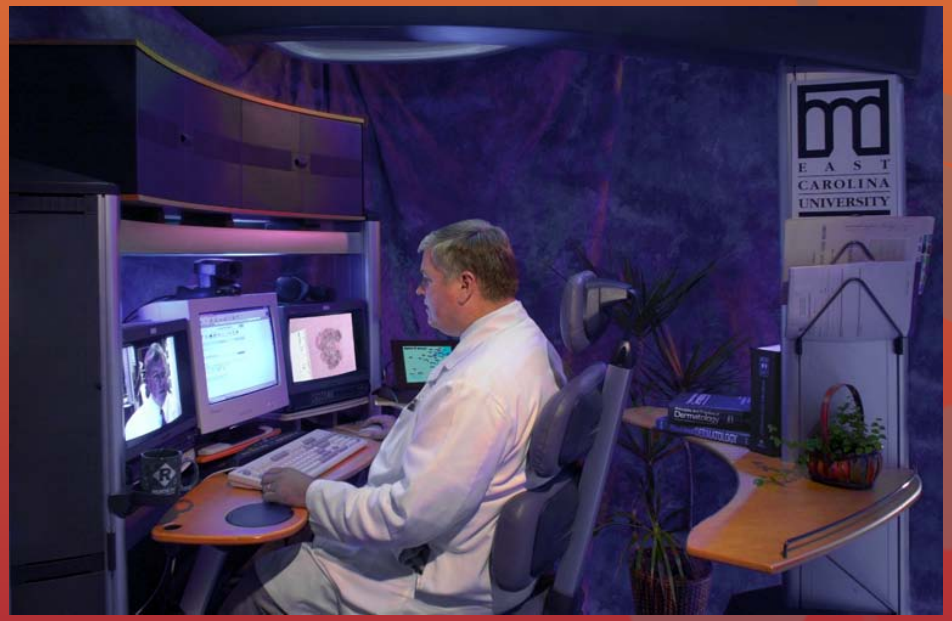
"Go ahead and tee off. Then I want you to listen to this wheezing"

- 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

ECU Telemedicine history

Research & Development

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

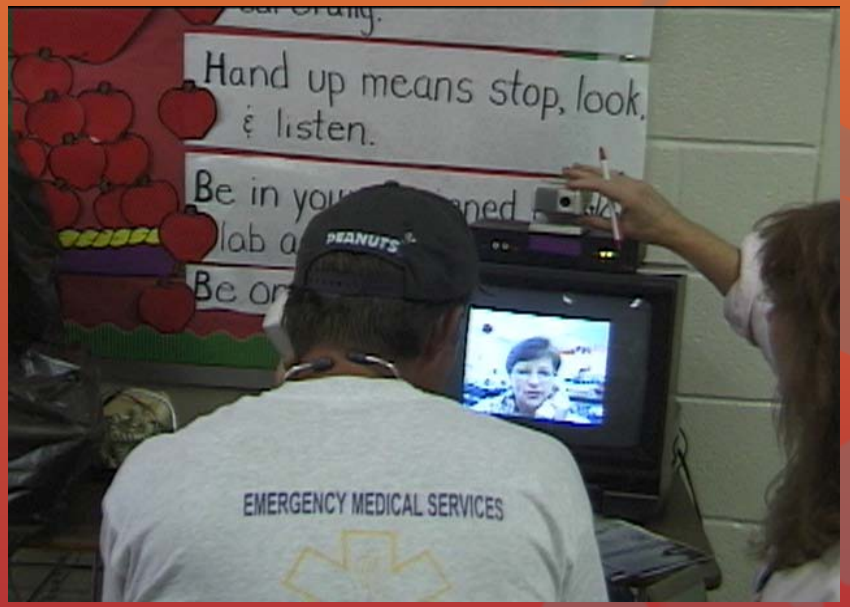


- Technical interface development for IP technologies with video tools - WFU/ECU – IP stethoscope
- Development of requirements for distribution of specialty care- dual inputs- EMG audio/video (and now Audiology)
- Telecommunications varieties, wireless, cable, cell, etc.

ECU Telemedicine History

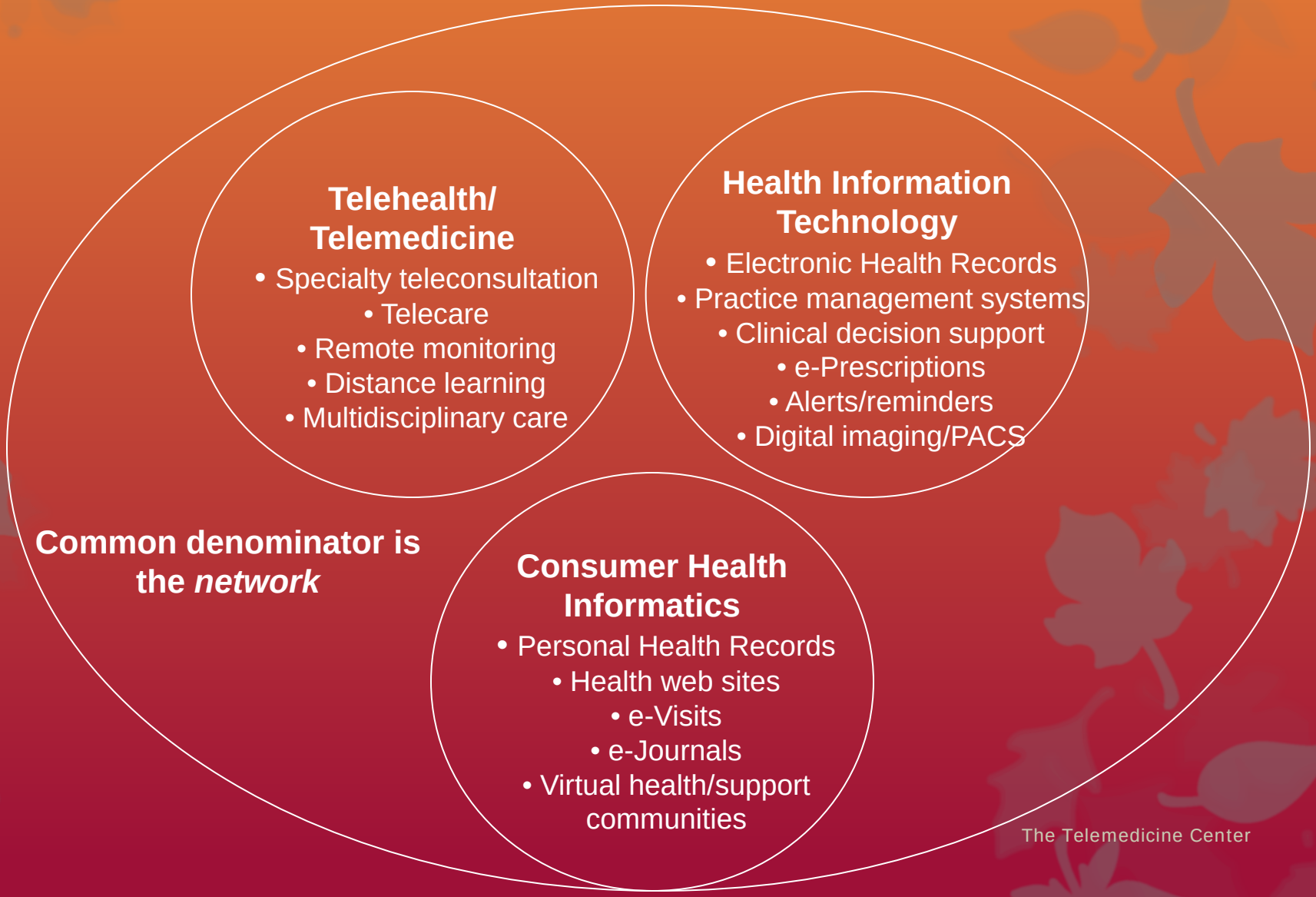
- Established Advanced Telemedicine Training with more than 600 attendees representing 28 countries since 1997
- Awarded “Center of Excellence” status by University of North Carolina General Administration in 1999, renewed 2004 & 2009

ECU Telemedicine History

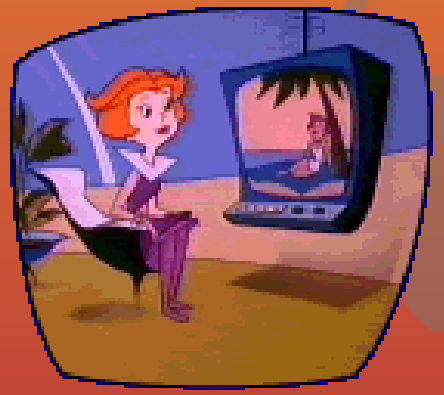


- Research in Disaster Relief and Bioterrorism Exercises since 1998
- Flood waters consume Eastern North Carolina homes and businesses in 1999

Connected health?



Basic Telemedicine Types



- **Interactive** (Synchronous)

  -Two way video, real time

  - high-bandwidth telecommunication

- **Store and Forward** (Asynchronous)

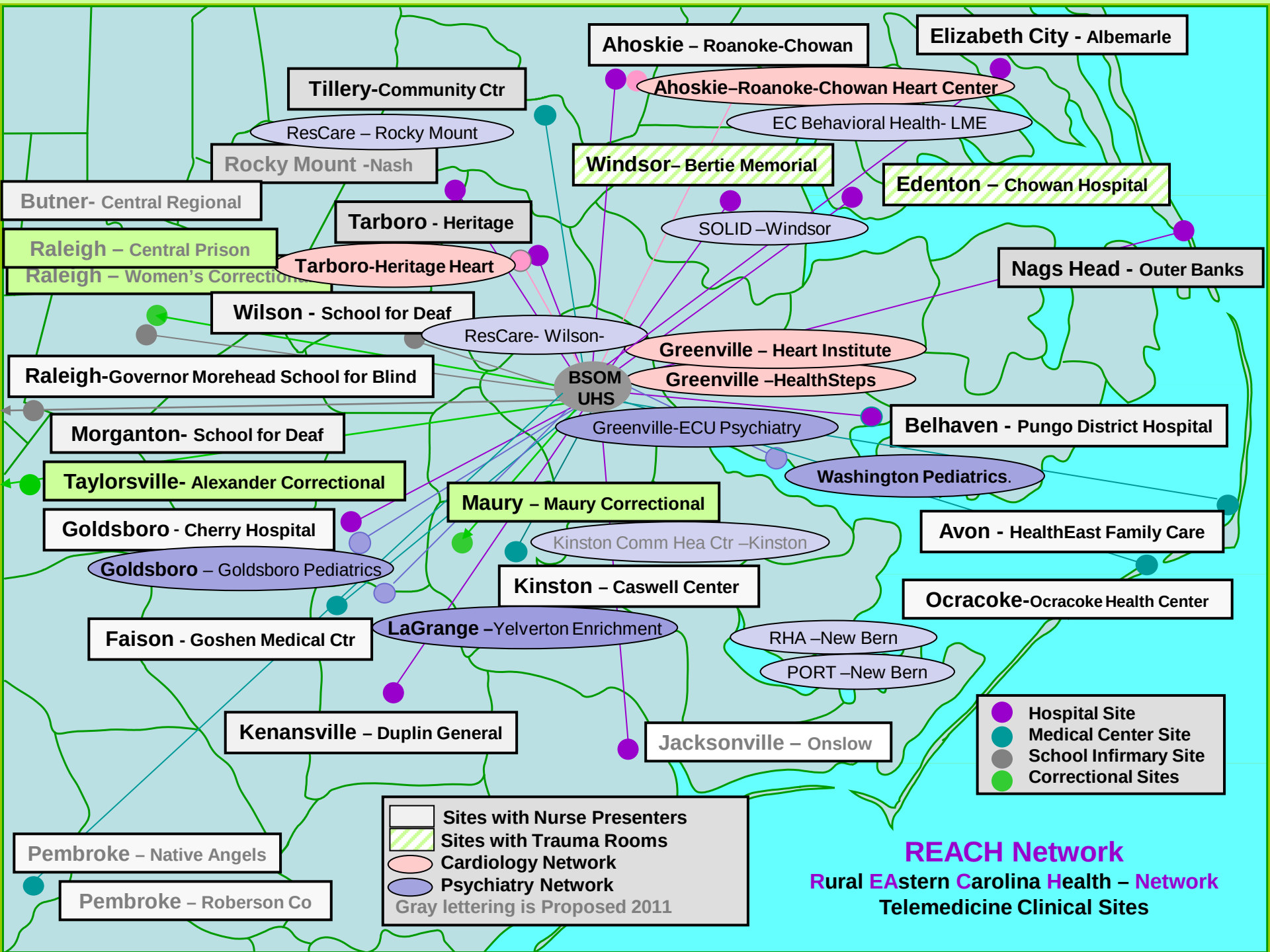
  - Images, audio or video files stored and transmitted, like e-mail, usually not real time

  - 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


Ahoskie – Roanoke-Chowan
Elizabeth City - Albemarle
Tillery-Community Ctr
Ahoskie–Roanoke-Chowan Heart Center
EC Behavioral Health- LME
ResCare – Rocky Mount
Rocky Mount -Nash
Windsor– Bertie Memorial
Edenton – Chowan Hospital
Butner- Central Regional
Tarboro - Heritage
SOLID –Windsor
Raleigh – Central Prison
Tarboro-Heritage Heart
Nags Head - Outer Banks
Raleigh – Women's Correctional
Wilson - School for Deaf
ResCare- Wilson-
Greenville – Heart Institute
Raleigh-Governor Morehead School for Blind
BSOM
UHS
Greenville –HealthSteps
Morganton- School for Deaf
Greenville-ECU Psychiatry
Belhaven - Pungo District Hospital
Washington Pediatrics.
Taylorsville- Alexander Correctional
Maury – Maury Correctional
Goldsboro - Cherry Hospital
Kinston Comm Hea Ctr –Kinston
Avon - HealthEast Family Care
Goldsboro – Goldsboro Pediatrics
Kinston – Caswell Center
Ocracoke-Ocracoke Health Center
Faison - Goshen Medical Ctr
LaGrange –Yelverton Enrichment
RHA –New Bern
PORT –New Bern
Kenansville – Duplin General
Jacksonville – Onslow
Hospital Site
Medical Center Site
School Infirmary Site
Correctional Sites
Sites with Nurse Presenters
Sites with Trauma Rooms
Cardiology Network
Psychiatry Network
Gray lettering is Proposed 2011
Pembroke – Native Angels
Pembroke – Roberson Co
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.

The Telemedicine Center

New mobile Models

ECU HD unit 2007

- 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

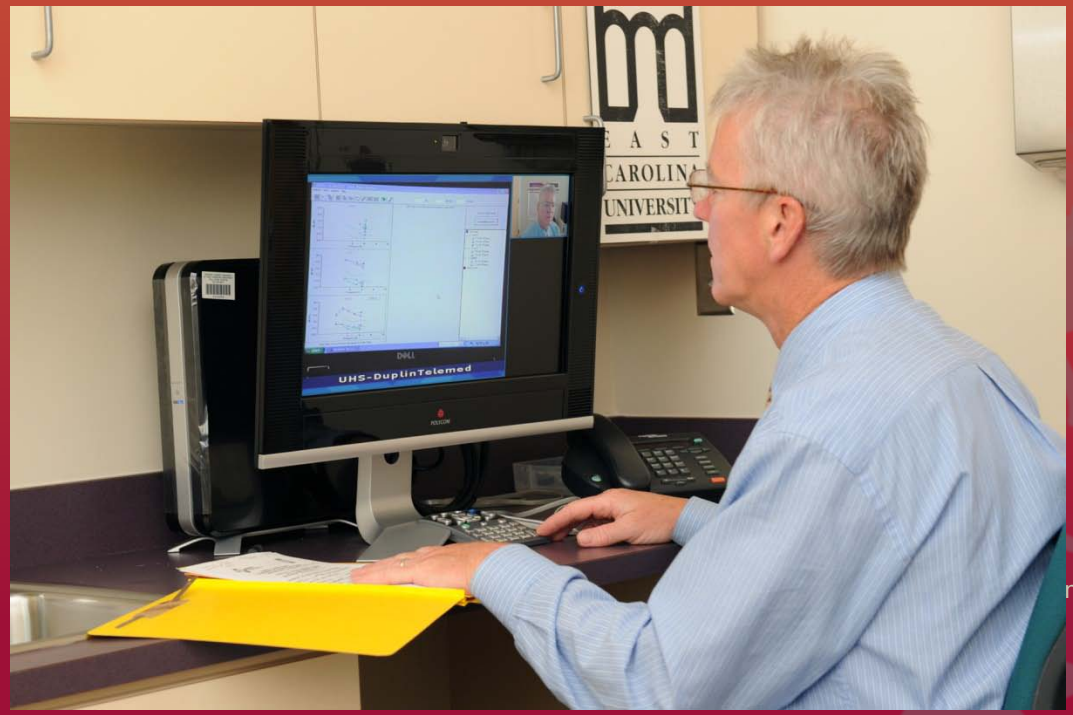
ECU Provider Technical Configuration

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

- 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

Patient End Units

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



ne Center

Gloria Jones

Assistant Director

Clinical Operations Manager

jonesgl@ecu.edu

ECU Telemedicine Center

(252) 744-3855

http://www.ecu.edu/telemedicine