Telemedicine Applications in Alaska

Innovations of the Last Frontier

Grand Rounds at Sarasota Memorial Hospital
Sarasota Memorial Health Care System
Friday May 21, 2010

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Overview of Telemedicine
“Telemedicine is the use of medical information exchanged from one site to another via electronic communications to improve patients' health status.”

“… "telehealth" .. is often used to encompass a broader definition of remote healthcare that does not always involve clinical services. “

ATA Defining Telemedicine
Categories of Telemedicine

- Videoconferencing
- Home Health
- Store & Forward
Categories of Telemedicine

- Videoconferencing
  - VTC, Real Time

- Store-and-Forward
  - Electronic Consultation

- Home Health
  - Remote Monitoring
Store & Forward vs. Real Time

Connectivity issues, scheduling challenges, and enhanced image quality drive store & forward usage.

- Documents and images
- Electronic medical records
- Patient education

Clinical specialties for telemedicine:
- Radiology
- Dermatology
- Pathology
- Oncology
- Ophthalmology
- Dental

Depending on the procedure, either real-time or store & forward can be used.

- Cardiology
- ENT
- GI
- Pulmonary
- Rheumatology

Clinical needs for real-time consultation and reimbursements make real-time a more viable option.

- Face-to-face interaction
- Immediate feedback

VTC
Real time
Synchronous

S&F is not a “stepping stone” to live interactive telehealth – it is an end product that improves health care.
Clinical Specialties

In Alaska

- Store-and-Forward
  - Dermatology
  - ENT
  - Cardiology
  - Primary Care
  - Others

- Videoconferencing
  - Psychiatry/Behavioral Health
  - Educational
  - Primary Care
  - Intensive Care Unit
  - Others
Tele-Psychiatry

*Videoconferencing*

- Videoconferencing
  - V.A.
  - ATA Special Interest Group
  - Alaska
Tele-Psychiatry

**Store-and-Forward**

- Store-and-Forward
  - On-site RN or MD performs an interview and fills out a patient history form
  - Recorded interview; video clip
  - Send the video clip and form to the psychiatrist
  - Psychiatrist reviews the information and video clip
  - Psychiatrist makes recommendations
  - On-site clinician treats pt.
Tele-Psychiatry

*Store-and-Forward*

Project that included 127 patients

- 2.2 diagnoses were made per patient
  - Mood 70%
  - Anxiety 50%
  - Substance abuse 40%
  - Personality DO 5%
  - Other 3%

- Medication changes in 70%
- New investigations 40%
- Specific psychotherapy / counseling approaches 52%
- In only 3 persons required face to face.

*Peter Yellowlees MD  University of California, Davis*
Provider-to-Provider Telehealth

- Physician consulting to another physician regarding the care of a patient.
- Physician consulting on a patient in a health care facility that is some distance away.
- Familiar to us
Provider-to-Consumer Telehealth

- Rapidly growing
- Home Health
  - Huge market
  - Bosch purchased viterion
- Web consultations
- More risk for abuse
  - i.e., illegitimate drug sites, for diet pills, enhancement drugs, etc.
- Less familiar, more “edgy”
- Major future driver?
Alaska Health Care
Alaska - Rurality

- 586,400 square miles
  - 1,420 miles (N-S) & 2,400 miles (E-W)
- 626,932 population
- Population density is 1.1 persons/mile²
- Approximately 100,000 glaciers
- 19 peaks over 14,000 feet
- 33,000 miles of coastline
- 25% Alaskans live in communities of less than 1000 people.
- More caribou than people
Benficiary Population*

Alaska State Population: 626,932

DoD/ DHS 75,000
VA 75,000
IHS/ Tribal 120,000

Total Federal/ Tribal Population 275,000
44%

Note: Total Federal/Tribal Population includes both “dual” and “triple” beneficiaries

* 2000 Census Figures
Most of Alaska is designated with some form of HPSA status.

Statewide underserved population of 370,088
- 59% of the state’s residents
- This is probably understated

23 of 27 Boroughs/Census Areas are either:
- Whole or part Medically Underserved Area/Population (MUA/P) or
- Governor-designated Medically Underserved Population (MUP)
Health Care Delivery

Federal system
• Military (US Army, US Air Force)
• USCG
• Veterans Affairs
• Alaska Tribal Health System (ATHS)

Public Health

Community Health Centers

Private Providers
Community Health Aide Program

- Preceded by Sanitation Aide Program in the 1950s
- Response to tuberculosis epidemic and high infant mortality
- Provides rural health care by training local people as medical providers
- In 1968, the CHA Program received formal recognition and congressional funding
Community Health Aide Program

• There are four sessions of CHA training; each lasts about one month

• Work within the guidelines of the 2006 *Alaska Community Health Aide/Practitioner Manual*, which outlines assessment and treatment protocols

• Physician supervisor
550 health aides/practitioners in 170 Alaska villages
Communication

• “So many times I just saw patients in my 12-by-16 cabin...”

• “And then if there's urgent or emergency, I often would try to call on the ham radio or -- and then I think it was in 1978 we finally got one phone that was in the store. Satellite phone. It had a lot of -- you know, a lot of, what do you call it, excess sounds.”

• Radio Medical Traffic and Family Docs
Telecommunications and Early Pilots
Early Telehealth Projects

- Radio Medical Traffic (1960s - )
- ATS-1 (1971)
- ATS-6 (1974)
- Barrow – pilot projects (1980s)
- NSHC - CHAIN designed for CHAPs, but lacked MD support ~ thus became a billing system only
- Maniilaq, EAT and SEAHRC Initiatives
ATS-1 NASA Application Technology Satellite

- 1966
- 1971 in AK
- Audio communications
- “Doctor Call” program
ATS-6 NASA Application Technology Satellite

- 1974 Satellite with 30 foot antenna
- Broadband communication
- Audio, video and data

- Galena, Tanana, Fort Yukon
- Fairbanks & Anchorage
Alaska Telemedicine Testbed Project

To evaluate the impact of low-bandwidth telemedicine systems on costs, professional isolation and provider/patient satisfaction.

Funding provided by the National Library of Medicine to the University of Alaska Anchorage

NLM Contract No. N01-LM-6-3540.
Communication, Culture and Medical Supervision

Doctor: “Where was the patient cut?”

Answer: “Behind the school.”

A picture is worth a thousand words

Store-and-forward consultation
VoIP, Anchorage dial tone
Telehealth
Teleradiology
VideoConferencing
EMR Access
Security
Current Telehealth Projects
**Alaska Fact**

Alaska is about the size of England, France, Italy and Spain combined.
Current Telehealth Projects

- AFHCP Teleradiology
- Maniilaq, EAT and SEAHRC Initiatives
- Alaska Telehealth Advisory Council and Initiatives
- ANMC Telepharmacy
- VA Telepsychiatry
- State of Alaska Department of Corrections Telepsychiatry
- GCI Connect MD
- Alaska Psychiatric Institute Tele Behavioral Health

- Providence Health System – consumer health, nursing telehealth, Russia initiatives
- Alaska Rural Telehealth Network
- Alaska Distance Education Technology Consortium
- Alaska Family Practice Residency Initiatives
- WWAMI Rural Telemedicine Network
- AFHCAN
Teleradiology
Phase I

PACS
Teleradiology Hubs
4 Sites
FY 1998
Phase I

4 sites: 3 hospitals and the VA clinic
Phase II

Regional Hospital and Clinics
- Digitizers, Frame grabbers and Clinical /Medium resolution or B level workstations.

Bi-directional connectivity
11 Sites – 9 IHS, 2 USCG
FY 1999
Phase II

Regional Hospital and Clinics
Full Time Physicians
Bi-directional connectivity
11 Sites – 9 IHS, 2 USCG
FY 1999
Phase III

40 Sub Regional and Village Clinics
- Revised the scope to implement Computed Radiography at all sites and fully integrated PACS at all regional hospitals.

Uni-directional connectivity
Maintain Referral Patterns
13 sites deployed

Adding New Functionality to Existing Sites
Build Infrastructure to Support Growth
Correct Deficiencies

FY 2000 to 2003
Phase III

40 Sub Regional and Village Clinics

Uni-directional connectivity

Maintain Referral Patterns

13 sites deployed

Adding New Functionality to Existing Sites

Build Infrastructure to Support Growth

Correct Deficiencies

FY 2000 to 2003
TeleBehavioral Health

Alaska Psychiatric Institute (API)
Alaska Fact

- Alaska has one of the highest U.S. rates of suicide

- Alaska has the highest U.S. rate of Fetal Alcohol Syndrome
Alaska Psychiatric Institute (API)


- Currently 72 beds (62 adult & 10 adolescent) on five (5) units: Chilkat, Denali, Katmai, Susitna, Taku.

- API Advisory Governing Body provides oversight to ensure programs & services are responsive to both constituents and stakeholders alike.

- Most extensive multi-disciplinary Mental Health capabilities and staff in Alaska.

“Emerging technologies provide the means to overcome geographical distances that often hinder access to care.”

“Telehealth . . . is a greatly underused resource for mental health services . . . especially for individuals with multiple chronic health conditions, those with severe illness and disability, underserved populations, children, and the frail elderly.”

¹ President’s New Freedom Commission on Mental Health
Goals

- **Extend Clinical Infrastructure** of the hospital to Rural / Remote areas of Alaska with High Quality – High Bandwidth Video Connectivity.
- **Increase Access to Services via Technology**
- **Expand Services to Children & Youth.**
- **Integrate Behavioral Health Services with primary care and tribal health clinics.**
- **Maximize Federal Revenue Streams for Behavioral Health Services.**
Services


• **Provide array of services to rural/remote beneficiaries:**
  – Psychological assessment and testing.
  – Clinical Supervision, training, support, & distance-delivered psycho-education.
  – Court-ordered Forensic evaluations.
Telepsychiatry – Active Sites

- Anchorage - Alaska Psychiatric Institute
- Fairbanks - Tanana Chiefs Conference
- Galena - Edgar Nollner Health Center
- Kenai - Dena'ina Health Center/Nakenua Family Services of the Kenaitze Tribe
- Talkeetna - Sunshine Community Health Clinic
- Naknek - C'amai Community Health Clinic
- Fort Yukon - Yukon Flats Community Health Center
- Seattle - Justin Mohatt, MD - Child & Adol. Psychiatrist
- South East Alaska Regional Health Consortium (all sites)
- Eastern Alleutian Tribes (all sites, temporarily on hold)
Alaska Fact

Land of Extremes

-83° F Prospect Creek in 1973
100 ° F Fort Yukon in 1915

- 40 active volcanoes
- Of the ten strongest earthquakes ever recorded in the world, three have occurred in Alaska
- 1964… Magnitude 9.2
AFHCAN Project
AFHCAN Project

Key initiative of the Alaska Federal Health Care Partnership

1998 - Present
A formal, voluntary, inter-agency relationship between the DoD, DoT, IHS and VA working together by the sharing of each other’s resources, talents, and experience to improve patient care throughout the state of Alaska.

Alaska Federal Health Care Partnership

- Veterans Affairs
- DoD (Army & Air Force)
- DoT - (USCG)
- Indian Health Service (IHS):
  - Alaska Native Tribal Healthcare Consortium (ANTHC)
AFHCAN MISSION

To improve access to health care for federal beneficiaries in Alaska through sustainable telehealth systems

- Alaska
- Federal
- Health
- Care
- Access
- Network
What are your key organizational goals for telehealth applications?

**GOALS FOR TELEMEDICINE**

- Quality of Care
- Access to Care
- Patient Satisfaction
- Continuity of Care
- Information Transfer
- Cost of Care/Saving

<table>
<thead>
<tr>
<th>Category</th>
<th>Lesser Priority</th>
<th>Average Priority</th>
<th>Higher Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of Care</td>
<td></td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Access to Care</td>
<td></td>
<td>4.5</td>
<td></td>
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<tr>
<td>Patient Satisfaction</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Continuity of Care</td>
<td></td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Information Transfer</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Cost of Care/Saving</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Store & Forward Telehealth

“Electronic Consultation”

- Low bandwidth requirements
- Static data – e.g. Vital signs
- Static Images
  - Digital camera (megapixel)
  - Scans
  - Captured video images (ENT, Dental, Opthal., Naso.)
- Video Clips – esp. from video devices
- Temporal Data: ECG, stethoscope, tympanometer
- Textual:
  - Health summaries

- Asynchronous.
- Can create a case “on the run.”
- Doctor can respond when available.
- Many consults are not critical.
- It is needed as a communication tool.
- Fits with present model.
- Minimal onsite technical support is needed.
Design the User Interface for the User

- Simplicity is key.
- Minimize need for keyboard skills
  - Touchscreen
  - Color coded

- Efficient usage
  - Create case in 5 to 10 minutes (typical)
A Primary Care Tool

- Ear Disease
  - Audiometer, Tympanometer, Video Otoscope
- Heart Disease
  - ECG & Vital Signs Monitor
- Respiratory Illness
  - Spirometer & Vital Signs Monitor
- Trauma, Skin & Wound
  - Digital Camera
- Dental Problems
  - Dental Camera
- General
  - Scanner & Forms
- Urgent Care / Critical Care
  - Video Camera
4th Generation Hardware Design
Visual Cues / Consistent Design

- Yellow border indicates image was selected for viewing.
- Image name will appear here.
- Click on box to add or delete checkmark (must be checked to save image in case).
- Flashing red border means image is not a live video feed.
- Indicates image originated from live video feed from camera.
- Name data entry box will appear when thumbnail is selected.
Educational “Moments”

Indicates you have pressed the **CAL** button on the Earscan module.

During tests, the LCD display on the Earscan module is your primary source of information.

This is a synopsis of the procedure for doing a calibration; full instructions are provided in this manual and in your training.

Instructions:
1. Remove earcuff (if any) on probe.
2. Place probe in calibration cavity.
3. Observe Earscan display.
4. Hold steady while testing.
5. Remove probe from cavity.
Vital Signs Monitor

VSM data is read into case even when away from VSM screen
AFHCAN Telehealth

- 8 years operational history
- R&D Telehealth System
- 10,000 cases / year
- Manufacturing of Medical Devices
- Whole Product Solution
  - Design → Installation → Training → Support → Marketing

- Installed Customer base includes:
  - 248 sites, 44 organizations
    - 37 Tribal organizations
    - US Army sites (6)
    - US Air Force bases (3)
    - State of Alaska Public Health Nursing (26)
    - US Coast Guard clinics (5)
    - US Coast Guard cutters and ice breakers (6)
Primary Care
( Frontier Medicine, Family Practice )

Satellite

Sycamore

Sitka
The four USCG Cutters in Alaska
Cases Created per Year (by Role)

- **Cases Created**
  - 2001: 2,000
  - 2002: 4,000
  - 2003: 6,000
  - 2004: 8,000
  - 2005: 10,000
  - 2006: 12,000
  - 2007: 14,000
  - 2008: 16,000
  - 2009: 18,000

- **Primary Care**
- **Specialty Care**

- **Legend**:
  - Blue: Primary Care
  - Red: Specialty Care

- **Years**:
  - 2001
  - 2002
  - 2003
  - 2004
  - 2005
  - 2006
  - 2007
  - 2008
  - 2009
When Do You Need A Telemedicine Consultation?

• **Uncertain about the diagnosis.**

• **Uncertain about the treatment.**

• **Uncertain about the outcome; complications.**

• **“Other” reasons.**
When Do You Need A Telemedicine Consultation?

- Uncertain about the diagnosis.
- Uncertain about the treatment.
- Uncertain about the outcome; complications.
- “Other” reasons.

- Granuloma annulare
- Ringworm/tinea corporis
- Sarcoidosis
- Cutaneous Lupus Erythematosus
- Psoriasis
- Hansen’s Disease
When Do You Need A Telemedicine Consultation?

• Uncertain about the diagnosis.

• **Uncertain about the treatment.**

• Uncertain about the outcome; complications.

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When Do You Need A Telemedicine Consultation?

- Uncertain about the diagnosis.
- Uncertain about the treatment.
- Uncertain about the outcome; complications.
- “Other” reasons.

- Going out of town; transferring care
- Legal documentation
- Disease progression
Ear Tube Follow Up
Hearing Aid Clearance
Impact of Telehealth on Clinical Care
Your voluntary participation in this survey helps to assess the hardware, software, and clinical utility of telemedicine. Precautions are taken to assure that your answers remain anonymous. There is, however, the unlikely possibility that someone could hack into the database at your institution and retrieve medical records as well as answers to this survey.

If you choose not to participate in this survey, press the 'Skip Question' button. Otherwise, please select an answer and press the 'Done' Button.

Please Answer This Question

1. For this case, rate the following statement: “Telemedicine helps me COMMUNICATE with a doctor.”

☐ Strongly Disagree
☐ Disagree
☐ Neutral
☐ Agree
☐ Strongly Agree

Comment
Telemedicine helps me COMMUNICATE with a doctor. (n=2,672)
Hiring Providers

• Alaska rural facilities spent $12,000,000 in 2004 to recruit for 13 provider types.

• The average cost to hire a provider is $38,000.
  – Tribal health organizations that include hospitals in their system expended $66,000 per new hire.
  – Rural health facilities average $42,575 to recruit each registered nurse

• Alaska's rural hospitals spent approximately four times the national average to hire providers.
  – Clinics spent approximately seven times the national average.

• This is only magnified when considering the higher turnover rate.
For this case, rate the following statement:

Telemedicine makes my JOB MORE FUN. (n=1,897)

“Each village trip I receive innumerable positive "amazing" comments from patients and parents about how wonderful this technology is for them. … I think the advanced cutting edge technology of telemedicine has actually kept my professional interest in staying within this region.”
How can Telehealth reduce the cost of health care?

Physician’s surveyed at the point of care … on a per-case basis.
Did viewing this telemedicine case/image affect PATIENT TRAVEL for diagnosis or treatment of this case (compared to a phone consult)?

- It PREVENTED Patient Travel
- It CAUSED Patient Travel
- It had NO EFFECT
Impact of Telehealth on Preventing Patient Travel

- Patient travel is prevented for almost 75% of all specialty consults.
- Travel is prevented for about 15% of all primary care cases.
Annual Travel Savings (by Case Role)

- Primary Care
- Specialty Care

ATHS (Alaska Tribal Health System) (1/1/2001 to 12/31/2009)
## Impact of Preventing Patient Travel

<table>
<thead>
<tr>
<th></th>
<th>Primary Care</th>
<th>Specialty Consults</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Cases</td>
<td>11,602</td>
<td>58,808</td>
</tr>
<tr>
<td>% Preventing Travel</td>
<td>15.5%</td>
<td>17.5%</td>
</tr>
<tr>
<td>Savings</td>
<td>$0.81 m</td>
<td>$4.63 m</td>
</tr>
</tbody>
</table>

- **Annual travel savings, based on 2009 data, is approximately $3.3 million for 3,666 patients**

- **Since 2001, travel savings generated by the use of AFHCAN telehealth amounts to approximately $20 million for 21,740 patient encounters.**
• Delivering quality healthcare in Alaska, with a population of 636,932 (US Census 2000) in 586,412 miles is challenging.

• Population density of 1.1 persons per square mile, 75% of the state is not connected to a road system and relies on dangerous small plane travel.

• National Travel and Safety Board (NTSB) reported 436 commuter aircraft accidents in 1990-2004 in Alaska. This is equivalent to 2.8 accidents a month and accounts for 36% of all commuter aircraft accidents in the US.
Impact of Telehealth on Causing Patient Travel

Patient travel is “caused” in 8% of all cases.
AK 2002 Medicaid Expenditures

$629.9 million

<table>
<thead>
<tr>
<th>Category of Service</th>
<th>Expenditure (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital Services</td>
<td>$172.9</td>
</tr>
<tr>
<td>Physician Services</td>
<td>98.8</td>
</tr>
<tr>
<td>Waivers</td>
<td>87.6</td>
</tr>
<tr>
<td>Mental Health</td>
<td>79.9</td>
</tr>
<tr>
<td>Nursing Homes</td>
<td>58.0</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>57.8</td>
</tr>
<tr>
<td>Transportation Services</td>
<td>28.9</td>
</tr>
<tr>
<td>All Other Services</td>
<td>45.7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$629.9</strong></td>
</tr>
</tbody>
</table>

FY2002 Medicaid Expenditures by Categories of Service

- Hospital Services: 27%
- Physician Services: 16%
- Pharmacy: 9%
- Waivers: 14%
- Nursing Homes: 9%
- Mental Health: 13%
- Transportation: 5%
- All Other Services: 7%
The transportation category includes, among others, ambulance, airline, taxi, medivac flights and accommodation services. The total expenditure for this category during FY02 was $29.0 million.
# Medicaid Study

*Decreased Travel = Cost Savings*

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Claims Paid by Medicaid</td>
<td>91</td>
<td>($6,970)</td>
</tr>
<tr>
<td>Telemedicine Prevented Travel</td>
<td>79</td>
<td>$55,437</td>
</tr>
</tbody>
</table>

**Notes:**
- Only specialty clinic travel is being saved.
- 86% of cases were from village → region
- Assume all cases had an escort
- Travel costs average $307.57 RT per person
- No lodging / per diem calculated

**Net Savings Realized by Medicaid**

$48,467

**Note:** For every $1 spent by Medicaid on reimbursement, $7.95 is saved on travel costs.
Improving Access: Reducing Waiting Times

Greater Efficiency of Existing Resources
Average Wait Time

- Data courtesy of Phil Hofstetter
Access

Data courtesy of Phil Hofstetter
Improving Access: Providing Care in the Patient’s Community
Ear Disease in Alaska

- Ear disease represents the major presenting symptom in 10-15% percent of all Alaskan village encounters.

- Ear Disease accounts for 59% of the antibiotic prescriptions for those under the age of seven.

- In a 1982 survey of four villages, chronic otitis media with effusion (OME) occurred in 8.9% of persons under 20 years of age and 21% of children under 5 years of age.

- Among groups most affected by chronic suppurative otitis media are the Inuits of Alaska (30% to 46%), Australian Aborigines (12 to 25%) and certain Native American tribes such as the Navajo tribes (4% to 8%).
1.) Identify a clinical need: Otitis Media, Ear Tubes, and Follow Up
## Traveling Audiologist

**Travel Avoidance = Cost Savings**

<table>
<thead>
<tr>
<th>Patient Visits</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,987</td>
<td>($175,000)</td>
</tr>
</tbody>
</table>

### Traveling Audiologist Program

- **Net Savings in Travel Costs Realized by Program:** $270,000 (150% ROI)

### Patient Travel Prevented

- **Patient Visits:** 1,073
- **Cost:** $442,162

- **Assumptions:**
  - Only travel to hub is being saved.
  - Escort required if patient less than 18 years old.
  - No lodging / per diem calculated.

- **Outcomes of Prevented Travel:**
  - Unnecessary & cases were archived without sending.
  - Referred for monitoring.
  - Take off ENT list - done.

- **Note:** 733 less than 18 yrs old.
About 72% of the patients seen needed something done (meds, surgery, ongoing monitoring) and 26% needed to be screened out.

Note: Percentages may not add to 100% due to multiple outcomes per case.
Improving Processes
Post-Surgical Followup: The "PE Tube Study"

- Can store and forward digital imaging (640X480 pixel resolution) replace in person examination for tympanostomy tube follow up?
% CONCORDANCE ON PHYSICAL EXAM

- **Tube In**
- **Tube Patent**
- **Drainage**
- **Perforation**
- **Granulation**
- **Middle ear fluid**
- **Retracted**

- **INTER-Provider**: 96%, 91%
- **INTRA-Provider (ALL Images)**: 94%, 90%, 88%
- **INTRA-Provider (GOOD Images)**: 96%, 96%, 96%
Comparison of surgical time (actual surgical time – estimated surgical time) for telehealth and non-telehealth cases. Values in the right half of the plot represent cases which took longer than planned (42% of telehealth cases and 47% of non-telehealth cases); values in the left half represent cases that took less time than planned (58% of telehealth cases and 53% of non-telehealth cases).

*Otolaryngology Head & Neck Surgery July 2010
ATHS (Alaska Tribal Health System) (1/1/2001 to 12/31/2009)
Increasing Efficiency

• ANMC ENT Department
  – 1500-2000 telemedicine encounters
  – These are patients encounters that would not have happened.

• Decrease Opportunity Costs
  – Equivalent to 15-20 ENT specialty clinics lasting 4 days
  – ENT physician cost savings ~ $100,000

• Additional Revenue ~ $100,000
  – With no additional ENT staffing needed to process cases
Rich, Minimal Data Needs

Electronic Medical Record (Organization A)

Telehealth System

Billing System

Electronic Medical Record (Organization B)

Billing System
Drivers for Integration

- Continuity of Care
  - Knowledge of telehealth cases within EHR
  - Providing EHR data to telehealth system
- Workload credit
- Billing
- Scheduling (e.g. Surgery)
- Integrating with other telehealth technologies
  - JVN
  - PACS
- Multiple modes/sources of information
- Multi-specialty consults
- Take advantage of communications capability
- Single repository
  - BLOBS / Images
  - Master patient list
  - MPI, NPI
## Telehealth Activity in Alaska

(market penetration)

<table>
<thead>
<tr>
<th>Service</th>
<th>Private</th>
<th>Federal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network – Connectivity</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Videoconferencing</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Store-and-Forward</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Home Health</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Teleradiology</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Computer Use</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Distance Learning</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Robotics</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Electronic Medical Record</td>
<td>Medium</td>
<td>Medium</td>
</tr>
</tbody>
</table>
Summary

• Telemedicine is having a positive impact within Alaska healthcare system.
  – Increased access to care
  – Improved quality of care
  – Demonstrated cost savings

• Network infrastructure
• Store & Forward and Videoconferencing adopted
• Further need for work and integration