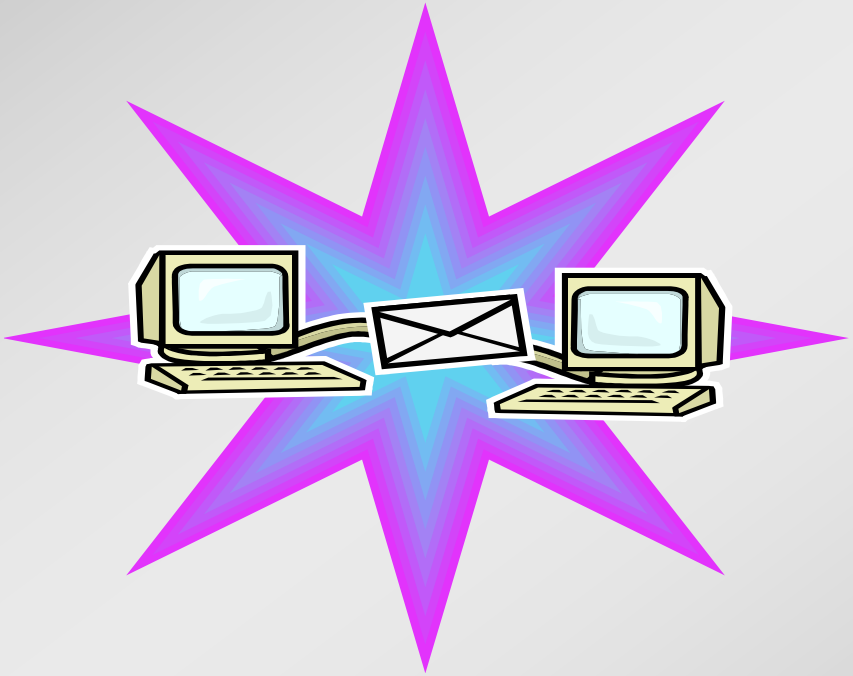
Telemedicine in Dementia Diagnosis and Treatment



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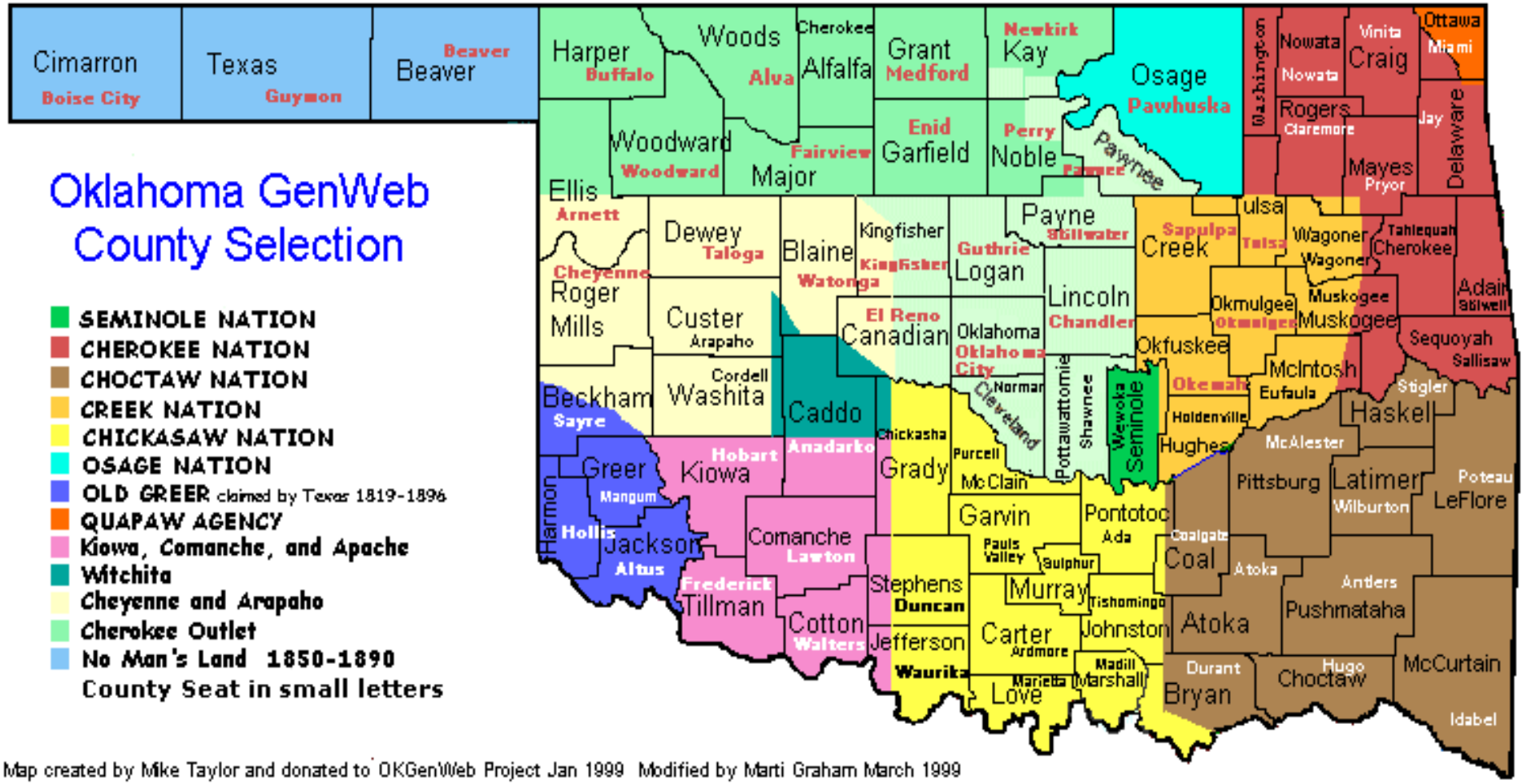
May 24, 2011

UT Southwestern and the Choctaw Nation

- UT Southwestern has a federally funded Alzheimer's Center
- Choctaw Nation satellite since 2001
- Telemedicine since 2005
- Choctaw Nation includes 15,000 sq mi in the southeastern Oklahoma
  - Approximately 80,000 persons
  - Choctaw Nation Healthcare Center is in Talihina, OK, pop. 1,200

Indian Nations in Oklahoma



Map created by Mike Taylor and donated to OKGenWeb Project Jan 1999 Modified by Marti Graham March 1999

Oklahoma


Kansas City
Wichita
Oklahoma City
Talihina
Dallas
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Lake Sardis

Aims of Telemedicine

- Provide excellent service
  - More rapid response to clinical need
    - Team can go to Oklahoma only 3 X/yr
    - Increases our ability to see new patients
- Improve show rate at live clinics
- Optimize faculty time
- Enable more frequent and regular f/u
- Facilitate research by creating good will and mastering VC technology

Personnel

- UTSW
  - Myron Weiner, M.D.
  - Hugo Pons
  - Kasia Harrah, B.S
- Talihina
  - Angela Curran, R.N.
  - Carey Fuller, B.S.
  - IR Technician

Technical Detail

- Connection uses protocol ITU-T H.323 (packet-based multimedia communications system)
- VC connection is two-directional 384kb/s from the UT Southwestern intranet to the commodity Internet cloud.
- Choctaw Nation has 1.5Mb/s connection to the commodity Internet
  - T-1 line to video bridge

Equipment

Dallas:

- Polycom HDX 7002 system, including
  - Codec (console)
  - Eagle Eye HD camera
  - HDX microphone array
  - Monitor LG 26” LCD
    - 26 in. diagonal screen

Talihina:

- Polycom™ system, 35” screen, IP based
  - Ceiling-mounted camera

Typical Videoconference (VC) setup

Testing Setup

Cost of Equipment

- Total discounted 2008 cost $9, 300
  - System: $6,700
  - Monitor $ 675
  - 3-year service contract $1,800
  - Shipping $68

Ongoing Costs (conservatively)

- Telemed average cost per patient = $250
  - Assumes 6 patients per session
- Includes (per patient)
  - TV cost @ 250 for 4 hours
  - Personnel time in Oklahoma
  - Physician time in Dallas
- In-person average cost per patient = $430
  - Assumes 6 patients per visit (8 would be $360)
  - Assumes 2 days doctor time (includes travel)
- Savings = $179

How We Do It

- Choctaw Nation healthcare professional contacts Talihina nurse
- Nurse contacts family and schedules visit for
  - NACC and ADC forms
  - Neuropsych battery and GDS administered by nurse
  - CDR administered by Mr. Fuller
  - All forms mailed to Dallas; neuropsych reviewed by Kasia Harrah
  - Labs and MRI
- MFW reviews labs and MRI electronically
  - Reviews paper copies of testing and history forms
  - Makes notes in preparation for TV session
- MFW and Ms. Harrah go to TV studio at UTSW

- KH opens electronic medical record
- MFW interviews patient and caregiver
- Tentative diagnosis and treatment plan offered
- Next visit scheduled
- MFW dictates note to KH who enters into electronic medical record
- Medications prescribed electronically
- $25 Wal-Mart gift certificate to patient and also to caregiver

Behind the Scenes

- Reminder note 1 week before appt
- Reminder call the night before
  - Reschedule if needed
- Videoconference link established by Medical TV (Mr. Pons) with Choctaw VC technician
- Session monitored by Mr. Pons to make adjustments in camera position, sound, TV picture
  - Reconnect us when connection fails

Outreach on the Road - Again

Patient Visits

Year	# clinics	NE	F/U	Total
2005	8	2	22	40
2006	8	5	8	21
2007	7	6	15	28
2008	10	12	25	47
2009	14	24	66	104
2010	14	16	59	89
Total	61	65	195	329

Description of Videoconferencing Sample (N=85)

		Min	Max	Mean (SD)	Median
% Female	53				
Age at First Visit		26.64	93.02	69.67 (12.79)	70.92
Education		5	16	11.28 (2.41)	12
Follow-up Visits		1	8	2 (1)	1
Follow-up Duration in Years		0.06	4.58	1.50 (1.37)	1.02

Initial Videoconference Diagnosis

	Frequency	Percent
Alzheimer Disease	47	55.3
Psychiatric Illness	12	14.1
Mild Cognitive Impairment	10	11.8
Other	6	7.0
Head Trauma	4	4.7
No Dementia	3	3.5
Parkinson’s Disease	2	2.4
Stroke/Vascular Dementia	1	1.2
Total	85	100

Satisfaction Survey

- Families are handed survey and stamped envelope with request they mail in.
- Approximately 62 distributed.
- 37 (59%) returned
  - 20 (54%) very satisfied
  - 12 (32%) satisfied
  - 2 somewhat satisfied
  - 1 neutral
  - 1 very dissatisfied (couldn’t hear or see doctor)

Choctaw Nation Telemedicine Satisfaction Survey

Please check “yes” or “no”.

1. I was able to communicate adequately with the doctor.	**____ Yes ____ No**
1. I was comfortable that the doctor was able to understand me today.	**____ Yes ____ No**
1. The examination was uncomfortable for me because it was done on television and not in person.	**____ Yes ____ No**
1. The examination would have been embarrassing to me even if it had not been on television.	**____Yes ____ No**
1. I had difficulty hearing the doctor.	**____ Yes ____ No ____ Yes but I am hard of hearing**
1. I had difficulty seeing the doctor.	**____ Yes ____ No ____ Yes but my eyesight is bad**
1. I would have gotten better care if I had seen the doctor in person.	**____ Yes ____ No**
1. I would use this clinic again.	**____ Yes ____ No**
1. My privacy and confidentiality were respected and protected.	**____ Yes ____ No**
1. Please circle the number that shows your overall satisfaction with your visit. **1 2 3 4 5 6 7** **Very Dissatisfied Dissatisfied Somewhat Dissatisfied Neutral Somewhat Satisfied Satisfied Very Satisfied**	
Additional comments:	

Future Directions

- Complete Telecognitive Assessment R01
- Complete Department of Defense contract to evaluate remote vs. on-site computerized neuropsychological testing
- Develop VC-based neurological exam for dementia patients

The “Touchless” Neurological Examination for Dementia

- Most neurological signs relevant to diseases presenting with dementia can be detected by observation
  - Movement disorders
  - Ataxia
  - Dyspraxia
  - Paralysis
  - Gaze

	Normal	Abnormal (describe)
1. Gait		
2. Station		
Speech		
3. Rate and volume		
4. Articulation		
Coordination		
5. Finger to nose		
6. Foot tap		
Strength		
7. Hold arms extended 15 sec		
Abnormal movements		
8. Myoclonus		
9. Dyskinesia		
10.Resting tremor		
11.Action tremor (finger to nose)		
EPS		
12.Bradykinesia		
13.Arise from chair		
14.Facial expression		
15.Rigidity		
Praxis		
17.Ideomotor L and R hand		Brush hair, teeth
18.Clock		
Executive		
19.Luria x 3		
Cranial N		
20.II Counts fingers		
21.III, IV, VI eye movements		
22.V Chews OK		
23.VII Symmetrical smile Repeat ma ma ma		
24.VIII hears fingers rubbed		
25.IX, X repeat ka ka ka		
26.XI Shrugs shoulders		
27.XII Tongue in midline		

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Praxis		
17.Ideomotor L and R hand		**Brush hair, teeth**
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Research Plan

- Projected N = 30
- Use telecog setup in Psychology
- Neurologist (MQ)examines patient directly and records findings
- Geriatric psychiatrist (MW) examines by VC
- Findings are compared

Disclosure

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