Telemedicine at UCI

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Definition of Telemedicine

Telemedicine (TM) has been defined as the use of electronic information and communication technologies to provide patient care when distance separates the participants.
National Library of Medicine
Current Citations
March, 2008

Telemedicine 9583
Robotics 5407
Laser 127,743
Stroke 120,106
Essential Components of a Telemedicine Program

- Clinical population in need of services
- Physician specialists qualified to serve the need
- Network to bring patient and specialist together
Telemedicine Program at UCI

Telemedicine Equipment Specifications

- Polycom video conferencing system
- Video camera
- Signal processing unit
- Interfacing unit between camera and phone lines
- 30 frames per second
- 3 standard telephone lines
- ISDN connection with 384 kilobits per second
Telemedicine Program at UCI
2001-Present

- 1,650 clinics
- 6,050 consults (neurology and psychiatry)
- UCI has contracted with National Telecenters, Inc (NTI)
- NTI incorporated 1992, has contracts with 7 Regional Centers with 13 sites for specialty consultations
## Diagnosis of Dementia in Down Syndrome by TM

<table>
<thead>
<tr>
<th>Category</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subjects Identified</td>
<td>254</td>
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<tr>
<td>Subjects Screened</td>
<td>243</td>
</tr>
<tr>
<td>Subjects Screen Positive</td>
<td>69</td>
</tr>
<tr>
<td>Subjects Declined to Participate*</td>
<td>19</td>
</tr>
<tr>
<td>Subjects Examined</td>
<td>66</td>
</tr>
<tr>
<td>Subjects Diagnosed with AD</td>
<td>40</td>
</tr>
<tr>
<td>Subjects Placed on Medication Therapy</td>
<td>38</td>
</tr>
<tr>
<td>Subjects Dx with a Pseudodementia</td>
<td>4</td>
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</tbody>
</table>

*Declined prior to or after screening
Feasibility Study of TM for Diagnosis of Dementia in DS

Significance Levels for Neuropsychological Test Results by Site and Premorbid IQ

<table>
<thead>
<tr>
<th>Site</th>
<th>Premorbid IQ</th>
<th>Interaction</th>
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<tbody>
<tr>
<td>DMR-SCS</td>
<td>0.738</td>
<td>0.004</td>
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<tr>
<td>DMR-SOS</td>
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<td>0.066</td>
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<tr>
<td>BPT</td>
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<td>0.006</td>
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</table>

UCI Future Applications of TM

- Addressing health disparities
- Triaging hospital admissions from remote sites
- Phase 3 clinical trials
- Medical student training
Leveraging TM equipment

- Medical Student TM Training Center
- FCC Award to California
Next Steps in Technology for Clinical Application of TM at UCI

- Need personal/laptop computer platform for physician consultation
- Easy to use, good resolution
- HIPPA encrypted for patient confidentiality
Challenges for TM

- Operational Funding
- Physician Acceptance
- Establishing Reliability
Relating TM to Other Disciplines

- Technology
- Policy
- Economics
- Law
Current Application of TM in the Neurosciences

- Stroke network, timely administration of anticoagulant therapies
- Remote monitoring of critical care with neurophysiological data streams
- International TM
  - Neurotrauma
  - Neuroimaging
  - Neuropathology
  - Mobile TM thru handheld computers
NIH Roadmap: Health Disparities

- Develop an optimal research infrastructure and testable hypotheses
- Effective mechanism for communicating research-based information to policy leaders, providers, and patients
- Clinical trial network
Future of TM at UCI

- Moving towards mainstream applications
- Hospitals will service patients without having them cross geographic barriers
- Urban, rural and international applications
Welcome to “Cyberia”

Ganapathy K, J Clin Neuroscience 2005
Personnel and Funding

Ira T. Lott, M.D.--Project Director
Eric Doran, M.S.--Project Manager
Anne Tournay, M.D.--Neurologist
Shelley Bose, M.D.--Neurologist
Elizabeth Head, Ph.D.--Neurobiologist
David Walsh, Ph.D.--Neuropsychologist
Mary Ann Hill, Ph.D.--Biostatistician

Departments of Pediatrics and Neurology;
Institute on Brain Aging and Dementia
Funded Projects Involving TM

- National Institute on Aging (AG, 21912; AG 16573)
- State of California
- Alzheimer Association (Senator Mark Hatfield grant award)
- “My Brother Joey Clinical Neuroscience Fund”