Roads Less Travelled: Emerging Practices in Neuropsychology TELENEUROPSYCHOLOGY

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AGENDA

- About me and how I became interested in teleNP
- Brief history of telehealth and teleneuropsychology
- Need for increased teleNP services
- What does teleNP look like in practice?
- Concerns and limitations
- Future of teleNP
- How to get started

A little about me…

- Clinical neuropsychologist at VA Hospital in Bedford, MA for ~3 years, worked at other VAs and in private practice prior to this (total 13 years in VA system)
- Work mostly with geriatric patients
- Teleneuropsych clinic since August 2017
- How I became interested in teleNP
  - Personal experience working in VA
  - Originally from smalltown USA (one stoplight—literally!)
  - Received Innovation Grant for teleNP clinic earlier this year

History of Telemedicine

- Telehealth or telemedicine refers to the use of telecommunications and information technologies to provide healthcare services across distances
- Has been around for decades
  - Univ. of Nebraska was first to use video communication for medical purposes in 1959 (tele-education and telepsychiatry program to provide services to state psychiatric hospital)
- In 1960s and 70s, NASA, DoD, and US Health and Human Services invested in telemedicine research
- Many advances in telemedicine are direct outcome of work done by the military (obvious need to provide healthcare to soldiers in remote areas)

Telemedicine in the VA

- 45% of veterans requiring treatment reside in counties classified as rural by the US Census Bureau
- Increasing access to care for veterans is one of VA's primary goals
- VA began a deliberate policy of building a national telemedicine program in 2003
- In FY 2016, telehealth has been implemented in >900 VA sites of care and VA has provided care to >702,000 patients via telehealth modalities
- >10,000 staff have attended at least one telehealth training
- High levels of patient satisfaction (88-94% satisfaction depending on modality)
- VA Video Connect is most recent advance in telehealth services

Telemedicine in the US as a whole

- According to the American Telemedicine Association, over half of US hospitals now use some form of telemedicine
- Currently about 200 telemedicine networks, with 3500 service sites in the US
- Continued growth is expected
  - Advances in technology
  - Reduction in healthcare expenses
  - Growing consumer demand
    - Patients growing more comfortable with idea of it
    - Business community benefits
  - Increase in geriatric population
    - Rural America aging more quickly than the rest of the country
    - 2/3 of health professional shortage areas are in rural communities
    - Older rural Americans have higher burden of chronic disease and greater chance of dying a preventable death

From teleMEDICINE to teleNEUROPSYCHOLOGY

- Teleneuropsychology = neuropsychological assessment conducted over a video connection
- While telemedicine has been around for decades, and is becoming increasingly common, teleneuropsychology is quite new
- Increased interest in use of telehealth technology in neuropsychological assessment over past decade
- Presents some unique challenges (e.g. some tasks hands-on, missed behavioral observations, etc.)
- No "gold standard" approach has been identified—many different approaches, batteries, etc.

Why TeleNP?

- Specialists in assessment and management of dementia are often located in urban areas, meaning access for rural residents can be challenging
  - Time
  - Travel
  - Cost
- Without support of specialized experts in dementia, patients with dementia are underdiagnosed in approximately 40% of primary care settings (Chodosh et al., 2004)
- Consequences of delayed or missed diagnoses=missed opportunities to manage symptoms, identify co-existing medical conditions that are contributing to cognitive dysfunction, identify harmful medications, assist caregivers, plan for future care, address legal and financial issues, and participate in clinical trials, as well as cost to society.

Particularly relevant in VA population

- As previously noted, 45% of veterans requiring treatment live in rural areas
- Many veterans are of advanced age, carry multiple medical diagnoses, and live in remote regions where travel to tertiary medical centers is difficult (Hill et al., 2010).
- Aligns well with VA Initiatives/Goals of increasing access to care and improving timeliness of care
- Necessary infrastructure already exists in terms of technology and staff

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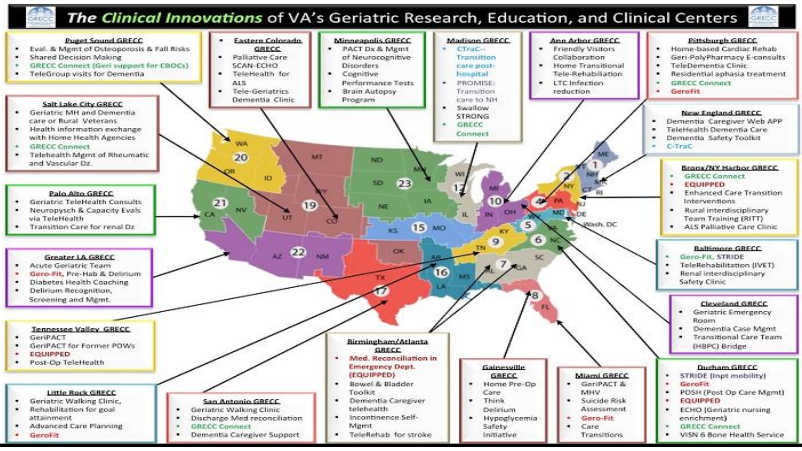
Also…why not??? VA/GRECC is



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Initial Questions and Concerns

- Will patients be able to "connect" and build rapport with examiners over video?
- Will technological issues disrupt the evaluation process?
- What about privacy and security issues?
- Will test selection/options be limited?
- Will patients who are less comfortable with technology (especially geriatric patients) find this type of evaluation acceptable?
- Is a third party involved, and if so, what about third party observer effects?
- Are the results of tests administered via videoconference just as valid and reliable as those administered in person?

Establishing a TeleNP clinic

- What are other sites doing?
  - RBANS seemed to be most common test/battery used for teleNP, but doesn't seem to be a "standard" battery
  - Brief cognitive eval vs. full neuropsych battery
  - TeleNP is part of half-day comprehensive geriatric eval at some sites, stand-alone clinic at other sites
  - Some have TCT (Telehealth Clinical Technician) in room with patient for entire session, some have TCT set up patient in front of computer and then leave
- Make a decision that works for you/your site

Things we considered

- Try to use many of the same tests used in our in-person neuropsych clinic
- Some tests necessitate a technician being in the room
- Reach a compromise between thoroughness and efficiency…and availability of TCTs
- Set referral parameters…who is the target population?
- Time limit?

What does our clinic look like?

- 5 available sites across NH means 5 different TCTs, exam rooms, etc.
- Two-hour appointment…sometimes runs a little longer
- Mostly fixed battery
  - CVLT-SF, Log Mem, Rey O, Verbal Fluency, WAIS-Similarities, Digit Span, Trails, Clock, BNT, word reading, GDS-SF
- TCT meets pt in waiting room, gets situated in exam room, and returns for ~last 30 minutes of eval to help administer tests
- Majority of eval is just examiner and examinee (plus collateral informant often present for interview)
- After eval, TCT scans pages that pt has written/drawn on and emails to examiner
- Feedback provided via phone call at later date

Establishing a TeleNP clinic

- Lots of pieces involved:
  - Telehealth Coordinator for the facility
  - Building a clinic in the electronic medical record
  - Establishing emergency plans
  - Ordering and distributing tests
  - Acquiring technology (EX-90)
  - Training technicians (TCTs)
  - Coordinating schedules and managing consults
  - Navigating two separate record systems
  - Generating referrals/spreading the word
  - After the evaluation…

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14 months later…what have we learned?

- Build it and they will come….
  - 81 referrals so far
  - 35 different providers have made referrals
- Patients and caregivers are highly satisfied…often to their surprise
- Overall, things have been quite smooth
- But…it's a learning process—making adjustments as we go
- Team effort is key

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What about those initial concerns?

- Will patients be able to "connect" and build rapport with examiners over video?
  - YES – strong evidence for acceptability and consumer satisfaction (>90% satisfaction rating, similar to satisfaction rates for telemedicine in general)
  - Similar response in our clinic
    - We ask about overall satisfaction, having adequate time, hearing provider, feeling cared for, feeling visit was private/confidential, feeling comfortable sharing personal information
  - Anecdotally, patients often tell us it's just like being seen in-person and are appreciative of the convenience factor
- Will technological issues disrupt the evaluation process?
  - RARELY, especially since changing hardware to EX90
    - No lag time
    - Camera can be angled at desk so examiner can easily see what patient is writing/drawing
    - Volume easily adjusted
    - Connection has never been lost
  - Earlier research suggests a small percentage of patients found equipment to be a hindrance, but with improved technology this is less of an issue

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What about those initial concerns?

- What about privacy and security issues?
  - Less of a concern in VA, as connection is behind VA firewall
  - Based on survey data, 100% have indicated agreement when asked if they felt the visit was private and confidential
- Is a third party involved, and if so, what about third party observer effects?
  - YES, a TCT is present for some tests (visual memory, Trails, BNT, Clock Drawing, word reading)
  - TPO effect is certainly something to be considered and degree of impact may vary from site to site depending on the TCT
    - Must weigh advantages/disadvantages
    - TCT Training helps but doesn't eliminate issue
    - Better than not being able to evaluate some skills at all?
    - Working on minimizing involvement of TCTs, increasing reliance on technology

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What about those initial concerns?

- Will test selection/options be limited?
  - YES, this is inevitable to some degree
    - Time limitations
    - Some "hands-on" tasks can't be administered virtually
    - Not all tests are available on-hand remotely/would need multiple test kits in order to have this available to each site
- Will patients who are less comfortable with technology find this type of evaluation acceptable?
  - Referral source supposed to assess for appropriateness before making referral
  - Some patients let us know this when we call to schedule and alternate arrangements can be made
  - Not necessary for vet to be "tech savvy" to feel comfortable with this type of eval, because they are not required to interact with the technology (TCT handles that)

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What about those initial concerns?

- Are the results of test administered via videoconference just as valid and reliable as those administered in person?
  - According to a meta-analysis published last year (Brearly et al., 2017), studies with older participants (>75 yrs old) and with slower connections yielded more variable results
  - TeleNP scores for untimed tasks and those allowing for repetition fell 1/10th of a S.D. below on-site scores
  - Verbally mediated tasks including digit span, verbal fluency, and list learning were not affected by teleNP administration
  - Heterogenous data precluded meaningful interpretation of tasks with a motor component

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Limitations

- Limited flexibility in scheduling
- Lots of moving pieces, more opportunities for things to go wrong
- Requires cooperation and buy-in from many people in order to work well (telehealth staff, administrative staff, technology staff, referral sources, patients, other providers at remote sites)
- Time – sometimes two hours doesn't feel sufficient
- Limited test options
- Non-standardized administration necessary for some tests raises questions of validity and reliability
- What about assessment of psychological or emotional functioning? (for example, is MMPI-2-RF an option given time limits?)
- Limited opportunity for behavioral observations outside of exam room
- What about assessment of performance validity?

Looking ahead in our clinic

- Innovation Grant awarded recently, used to buy some additional tests and technology
  - Noise-cancelling headphones
  - MMPI-2-RF for each location
  - PVTs
  - Document camera
- Trainees will be involved this year
- Process more streamlined
- Constantly learning from mistakes and adapting on the fly

Future of Teleneuropsychology as a field

- Lots of research yet to be done
- How can we make it as similar as possible to in-person evaluation with all the conveniences of teleNP?
- Need for more consistency in teleNP batteries (gold standard?)
- TeleNP to the home?

How to get started if interested in teleNP

- Process much easier if currently working in VA system
- Consider need in your area, target population, test battery, and technology (high-speed connection is really a necessity)
- Talk to someone who is already doing teleNP—be as prepared as possible for challenges that may arise
- If not in VA, must consider limitations of practicing only in state where you are licensed
- Billing—check with insurance companies in your region
- Trial and error—you will learn as you go

Thanks for your attention!

Questions?

Feel free to email me with any questions that may come to mind later:
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Roads Less Travelled: Emerging Practices in Neuropsychology

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16 September 2018

Roads Less Travelled: Emerging Practices in Neuropsychology

- **Neuropsychology and the Armed Forces**
- **History of (Neuro) Psychological Assessment in the Military**
- **Military Neuropsychology Training and Functions**
- **DoD Research & Treatment Initiatives Involving Neuropsychology**
- **Complex Issues in Military Neuropsychology**
- **Applications to Civilian Neuropsychology**
- **Future of (Neuro) Psychology in the Military**

Roads Less Travelled: Emerging Practices in Neuropsychology

- Neuropsychology in the Armed Forces
  - Relevance: proven force multiplier
  - Primary Mission: help Service Members (SMs) with neurologic issues/foster effective recovery
  - Pre-deployment baselines
- History of (Neuro) Psychological Assessment in Armed Forces
  - Behavioral manifestations of neurological injury documented dating back to 3000 BC
  - 1917 "Personality Data Sheet"; Army alpha and beta tests
  - WWII: Clinical Psychologists
    - Assessment, treatment, research
    - Evolution of Battlefield Medicine- preserved life but more neurological, cognitive, psychological sequelae

Roads Less Travelled: Emerging Practices in Neuropsychology

- Military Neuropsychology Training
  - 1982: American Board of Clinical psychology formal training requirements for neuropsychologists
  - AF/Navy fellowship training at Civ Institutions; followed by Army at Walter Reed (1st Mil post-doc in neuropsych accredited by APA) and Tripler; SAMMC in 2008 (AF primary site in 2014)
  - 3-5% Active Duty psychologists fellowship trained
  - Civil Service (GS) and contract positions at MTFs
- Military Neuropsychology Functions
  - Assessment and treatment in MH/Neuropsych/TBI Clinics
  - Inpatient rehab team for acute injury
  - Fitness for Duty/Medical Boards
  - Clinic/Prgm Directors

Roads Less Travelled: Emerging Practices in Neuropsychology

- DoD Research and Treatment Initiatives
  - Mild TBI major research focus area
    - Approximately 350K SMs have experienced TBI
    - Majority (82%) mild TBI
  - Validity testing
  - Treatment outcomes
  - MTF based Concussion Clinics
  - 4-week IOP Prgm NICoE Walter Reed
    - Comprehensive Interdisciplinary Care
    - Extended to 5 Intrepid Centers, with goal of 9 across US

Roads Less Travelled: Emerging Practices in Neuropsychology

- Complex Issues in Military Neuropsychology
  - Concussion outcomes
  - Blast wave versus blunt force trauma
  - Performance validity
  - Malingering
  - Medically Unexplained Symptoms
- Applications to Civilian Neuropsychology
  - Treatment and rehabilitation
  - Forensic Neuropsychological applications
  - Assessment and selection

Roads Less Travelled: Emerging Practices in Neuropsychology

- Future Of (Neuro) Psychology in the Military
  - Ecological validity
  - Predicting performance and attrition
  - Biomarkers and the role of Neuropsychologists
  - Neurocognitive enhancement
  - Embedded Operations
    - Prevention
    - Performance Enhancement
    - Population based
    - Ethical issues

Roads Less Travelled: Emerging Practices in Neuropsychology

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Questions??
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