Cognitive Rehabilitation in mTBI
Information Brief

Defense Centers of Excellence for Psychological Health and Traumatic Brain Injury
July 21, 2010
Purpose


• Request assistance from the forum in the implementation of the policy
TBI Surveillance: DoD Totals

Number of TBI cases

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of TBI cases</th>
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<tbody>
<tr>
<td>DoD Baseline 2000</td>
<td>10,963</td>
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<td>DoD 2007</td>
<td>23,002</td>
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<td>DoD 2008</td>
<td>28,557</td>
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<td>DoD 2009</td>
<td>27,862</td>
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Data Source: AFHSC
Current Situation

• Accelerating but still small body of scientific literature supporting cognitive rehabilitation in mTBI

• DoD Programs (current visibility):
  – USA: 2 programs, 6 sites with some capability
  – USAF: 2 programs
  – USN: 2 programs

• Consensus Conference – April 2009
  – 2-day; 50 members
  – DoD/DVA representation
  – Quad Service representation
  – SOCOM/Reserve Affairs representation
  – Civilian Subject Matter Experts
# Cognitive Rehabilitation in mTBI Conference Report: Recommended Referral Intake Process

- **Referral**
  - Can be initiated by any provider
  - TBI w/cog symptoms or complaints

- **Intake Process**
  - Evaluate for appropriate referral/other conditions that preclude cog rehab

- **Assessment**
  - Neurological Assessment
  - Cognitive Assessment

- **Cog Rehab**
  - Targeting appropriate domains
  - Evidence-based interventions
  - Holistic approach
  - Team leader
  - Regular communication across providers

- **Re-Eval**
  - Objective measures for re-evaluation to monitor progress and refine treatment goals

- **Discharge**
  - Objective discharge criteria and defined plan
  - Aligned with other elements of a TBI Program
  - Objective outcome measures

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**Ideal Interdisciplinary Team:** Primary Care/Neurology/PM&R, Neuropsychology, Mental Health, SLP, OT with coordination with Specialty Clinics as needed (i.e., Pain Clinic)
Policy signed Apr 14 2010 directed:

- Implementation at 14 MTFs
- Subsequent discussion with the Services resulted in modification of the 14 to the following: Ft. Bragg, WRAMC, Redstone Arsenal, Ft Campbell, Ft Gordon, BAMC, Ft Stewart, Ft Riley, Wilford Hall, Elmendorf, Camp Pendleton, Portsmouth, Camp Lejeune, and San Diego. (Out: Ft Hood and 29 Palms) (In: Ft Stewart, San Diego)
- Beginning in the 2010 calendar year each MTF will track outcome measures identified in the Clinical Guidance Document.
- Report back to the CPSC by Sept 30, 2010
Actions to Date

• Discussed in weekly TBI QUAD Service Meeting (beginning in April 2010)
• Agreed on Phase 1 metrics (demographics)
• Finalized list of 14 demonstration sites: Sites approved by DASD (C&PP)
• Held teleconference with participation of all 14 sites on 14 July 10
• Metric collection will begin on 1 Aug
  – Service specific requests on how data will come in and to whom
Metrics

• Will contain Protected Health Information without Personally Identifiable Information
• Phase 1 – Demographics – Gender, age, marital status, branch of Service, component, rank, education, date of injury, mechanism of injury, date of admission, date of discharge, reason for discharge, facility information including staff
• Phase 2 – Outcome-based metrics – attention, memory, processing speed, therapeutic interventions, functional outcomes, patient satisfaction, etc
Way Ahead

- Services to disseminate HA Policy with clinical guidance document to their demonstration sites and direct them to implement the guidance which will standardize the approach to cog rehab in the MHS – This has been slow
- Services to educate cognitive rehabilitation providers of evidence-based interventions – No evidence of this
- DCOE has funding and expert personnel to assist with dissemination of HA policy and education, but must be invited by the Services
- The DCoE working with the Services needs to create standardized cognitive rehabilitation outcome measures and collect the metrics into a database to guide development of future DoD programs
- The DCoE will report back to the CPSC with results of implementation by the end of the year
- The Services are responsible for implementing the new program. Must be held accountable. DCoE is the main proponent at this time, but does not have authority to implement programs
- Requests assistance in moving the implementation of the Cognitive Rehabilitation Clinical Guidance
Cognitive Rehabilitation in mTBI

• Questions?
## Cognition

### Concussion Management Grid

<table>
<thead>
<tr>
<th>Cognition</th>
<th>Memory loss or lapse</th>
<th>Forgetfulness</th>
<th>Poor concentration</th>
<th>Decreased attention</th>
<th>Slowed thinking</th>
<th>Executive dysfunction</th>
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<tbody>
<tr>
<td><strong>Administer:</strong> MACE if injury within 24 hours, Other neurocognitive testing as available (eg ANAM or other neuropsychological testing)</td>
<td>Gather: Collateral information from family, command and others</td>
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<th></th>
<th>Normalize sleep &amp; nutrition</th>
<th>Pain control</th>
<th>Refer: Speech/language pathology</th>
<th>Occupational therapy</th>
<th>Neuropsychology</th>
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</thead>
</table>
Process

• Core Focus
  – SMs who are 3+ mos post mTBI with ongoing cognitive symptoms including memory, attention,
  – Acknowledge potential psychological and physical co-morbidities but guidance to focus on where/how in broader spectrum of care this treatment should be applied

• Conference Structure
  – 4 Breakout Groups
    • Assessments
    • Interventions
    • Outcome Measures
    • Programs
Conference Report Summary: Assessments

Figure 1: Referral Process

- Referral
  - Intake Process
    - +/- TBI
      - No cognitive symptoms
        - Educate referring provider
        - Educate and reassure patient
        - Refer back to referring provider
    - No TBI
      - Cognitive symptoms are present
        - Refer back to primary care provider for medical and psychological evaluation
    - + TBI
      - Cognitive symptoms are present
        - Severe comorbidities are present
          - Case manager assigned
        - + TBI
          - Cognitive symptoms are present
            - No comorbidities or comorbidities are controlled
              - Case manager assigned
              - Neurological Assessment
                - Reconsider for cognitive rehabilitation
              - Cognitive Assessment
                - TBI Cognitive Rehabilitation
      - * Primary care provider of patient is notified
      - ** If specialty referral resolves cognitive symptoms then the case manager will follow up with the patient by phone every 6 months

| Assessments | | Assessments |
|-------------|------------------|
| Attention/Concentration | PTSD Screen |
| Memory | Post-concussive symptoms rating |
| Processing Speed | Pain screen |
| Executive Functioning | Substance Abuse screen |
| Symptom Validity and Effort/Motivation | Depression screen |
Conference Report Summary: Interventions

• Cognitive Domains affected after TBI
  – Attention
    • Foundation for other cognitive functions/goal-directed behavior
    • Efficacy of attention training established
  – Memory
    • True memory impairment vs poor memory performance from inattention
    • Evidence to support development of memory strategies and training in use of assistive devices (‘memory prosthetics’)
  – Social/Emotional
    • Evidence to support group sessions in conjunction with individual goal setting
  – Executive Function
    • Evidence to support training use of multiple step strategies, strategic thinking and/or multitasking

• Compensatory vs Restorative Therapy
## Conference Report Summary: Interventions

<table>
<thead>
<tr>
<th>Area of Cognitive Impairment</th>
<th>Empirically-supported interventions</th>
<th>Specific Examples</th>
<th>Area of Cognitive Impairment</th>
<th>Empirically-supported interventions</th>
<th>Specific Examples</th>
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<tbody>
<tr>
<td><strong>Attention</strong></td>
<td>Attention process training</td>
<td>Letter cancellation tasks with distracting noise in background Completing two cognitive tasks simultaneously</td>
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<td>Working memory training</td>
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<td><strong>Executive functioning</strong></td>
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<td><strong>Social pragmatics</strong></td>
<td>Group cognitive therapy</td>
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<td><strong>Attention</strong></td>
<td>Problem solving training</td>
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<td>Error management training</td>
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<td><strong>Memory</strong></td>
<td>Emotional regulation training</td>
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<td><strong>Social pragmatics</strong></td>
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<td><strong>Memory</strong></td>
<td>Various mnemonic techniques</td>
<td>Story method</td>
<td><strong>Attention</strong></td>
<td>Integrated use of individual and group cognitive, psychological and functional interventions</td>
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<td>Visual imagery</td>
<td>Acronyms</td>
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<td>Imagery based training</td>
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<td>Memory notebook</td>
<td>Prosthetics</td>
<td><strong>Memory</strong></td>
<td>Internal problem-solving</td>
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<td>External Cuing</td>
<td>PDA</td>
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<td>Internal dialogue</td>
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<td>Supervised living</td>
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<td>Individual and group self-</td>
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<td>BlackBerry</td>
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<td>Anger management groups</td>
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Conference Report Summary: Interventions

- TBI typically affects many brain regions resulting in many different cognitive and emotional functions

- Holistic programs
  - Interdisciplinary with strong leadership to coordinate and prioritize treatment objectives
  - Objective is to improve functioning in all major areas of life
  - Emphasizes use of person’s current strengths to overcome TBI-related and other impairments
Conference Report Summary: Outcome Measures

• Defining the patient: cognitive deficit secondary to TBI vs comorbidity
• Administrative metrics
• Pre-post- assessment differences
• Pre-post- functional differences
• Patient status at discharge
• Consumer satisfaction
  – Patient, family, employer/Command, referral source
Conference Report Summary: Outcome Measures

<table>
<thead>
<tr>
<th>Administrative Performance Metrics</th>
<th>Pre-Post-Assessment Differences</th>
<th>Pre-post-Functional Differences</th>
<th>Moderating Variables</th>
<th>Discharge Criteria &amp; Patient Status at Time of Discharge</th>
<th>Consumer Satisfaction</th>
<th>Aggregate Program Outcome Data</th>
</tr>
</thead>
<tbody>
<tr>
<td># of patients seen</td>
<td>formal neuropsych evaluation</td>
<td>job performance</td>
<td>degree to which co-morbidity may be resulting in cognitive symptoms</td>
<td>goals attained</td>
<td>patient, family, employer/command, and referral source</td>
<td>type and # of service providers</td>
</tr>
<tr>
<td># of patients referred for medical appts</td>
<td>symptom status</td>
<td>need for redesignation/duty restrictions</td>
<td>pain</td>
<td>plateaouing of improvement and/or failure to improve worsenings symptoms</td>
<td>education, treatments, efficacy</td>
<td>range of services</td>
</tr>
<tr>
<td>duration &amp; daily intensity of prgm</td>
<td>functional status</td>
<td>pre-injury fitness reports/evals vs. current functional abilities</td>
<td>severity of associated physical injuries</td>
<td>discharge source</td>
<td>clear description of the program/interventions</td>
<td>consistent/ well-defined entry criteria</td>
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<tr>
<td>length of time patient is on limited duty</td>
<td>domains tested during Cognitive Assessment</td>
<td>performance on simulators</td>
<td>mechanism of injury age</td>
<td>education</td>
<td>clear documentation</td>
<td>consistent/ well-defined discharge criteria</td>
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</table>

- type and # of service providers
- range of services
- consistent/ well-defined entry criteria
- consistent/ well-defined discharge criteria
- clear description of the program/interventions
- clear documentation
Conference Report Summary: Programs

• Considerations
  – Patient population
  – Resource utilization
  – On-site and local resource availability
  – Base characteristics
  – Special populations (SOCOM, Reserve, National Guard)

• Ideal
  – Holistic in nature
  – Interdisciplinary with coordination of care
  – Sub-component of a TBI program
Conference Report Summary: Programs

• Core Components
  – Comprehensive assessment prior to treatment
  – Individualized treatment goals
  – Development of interdisciplinary individualized treatment plan
  – Periodic cognitive reassessment and review of goals resulting in updates to treatment plan
  – Development of well-defined discharge plan