Emerging Best Practices in TBI Rehabilitation

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Disclosure

• I have no commercial affiliations relevant to the content of the presentation
• I have a potential conflict of interest as one of the authors of the INCOG guidelines, the ABIKUS guidelines and ONF-INESS guidelines
Lisa

- 30 year old woman married with no children
- skiing accident sustaining a severe TBI - initial Glasgow Coma Scale = 8
- Coma for 48 hours and PTA for 7 days
- has mild left hemiparesis
- Initially irritable/restless but improves and still little impulsive/ lack of insight
- Admitted for rehab 3 weeks post injury
Lisa

- in inpatient rehab- became independent in ADL and minimal supervision with community living skills
- receives outpt rehabilitation and improves with PT and OT
- husband notices some ongoing irritability and memory impairment
- very supportive employer is willing to take her back
- returns to work 8 months after injury as a lab technician
Lisa (two years later....)

- Gained 25 lbs- Lisa anxious about attending gym because she's aware of the appearance of the very mild hemiparesis
- Husband is reporting challenges in relationship including lack of awareness of impact on others, impulsivity and emotional lability
Lisa (two years later....

- employer had expressed concerns about her memory, occasional outbursts and problem-solving skills
- laboratory faces cutbacks because of decreased government funding
- Lisa laid off with other more junior workers
Lisa (two years later....)

• Lisa's mood is low because of lack of meaningful activities
• Lisa would like to start a family however husband concerned that she may not be able to manage new baby
Questions to be addressed today

- What is important for people with TBI like Lisa?
- What do clinicians want guidance and advice?
- Where can I find some evidence based resources and guidelines?
- What are some best practices interventions that could help Lisa?
Objectives

By the end of this presentation participants should be able to:

1. Name important factors influencing Quality of Life (QOL) for people with TBI needs
2. Identify clinicians priorities for ONF-INESS TBI best practice guidelines
3. Access some existing best practice resources/guidelines that may be helpful
4. Name some best practices that address important issues for QOL
Objective 1

• Name important factors influencing Quality of Life people with TBI needs
Quality of Life Post TBI


+ve Employment status (Corrigan 2001, Steadman-Pare 2001, Dahm 2014, Viera 2013, Jacobsson)

+ve Community reintegration (Corrigan 2001, Steadman Pare, Forslund 2013)

+ve Marital status/Family support (Corrigan 2001, Steadman Pare, Jacobsson, Viera 2014)

+/-ve Pre and post injury coping Styles (Dahm 2014, Ponsford)

-ve Behaviour changes (Diaz, 2012)

-ve Pain (Dahm 2014, Williamson 2013)

-ve ADL assistance (Williamson, 2013)

-ve Cognitive impairments (Dahm 2014)

-ve Anxiety (Dahm, 2014)
Which QOL Factors Can we do something about?

- ve  Depressed Mood
+ ve  Employment status
+ ve  Community reintegration
+ ve  Marital status/Family support
+/ - ve  Pre and post injury coping Styles
- ve  Behaviour changes
- ve  Pain (Dahm 2014, Williamson 2013)
- ve  ADL assistance (Williamson, 2013)
- ve  Cognitive impairments (Dahm 2014)
- ve  Anxiety (Dahm, 2014)
Quality of Life (Not directly associated)

- Time post injury (Jacobsson,)
- Severity of Injury (Jacobsson,)
QOL for Family after brain injury

• poor family functioning and symptoms of anxiety and depression in the relatives were predicted by:
  • behavioural changes in the injured individual
  • mood in the injured individual (Schonberger, 2010)
Take home messages about QOL after TBI

*Pay more attention to*

- Depression
- Behaviour
- Interpersonal Relationships
- Productivity options
- Cognition
- Pain
Objective 2

- Identify clinicians priorities for ONF-INESS TBI best practice guidelines
The steps of the ONF-INESS Guidelines project

1. Scoping review and quality evaluation of existing CPGs
2. Survey of end-users’ needs and expectations
3. Synthesis of all existing information
4. Expert consensus
5. Implementation of the CPG in the clinical settings
SURVEY of End users needs for Guidelines

CLINICAL PRACTICE GUIDELINE
FOR THE REHABILITATION OF ADULTS WITH MODERATE TO SEVERE TBI
Methodology

- Electronic survey based on the CFIR model and the analysis of existent CPGs;
- Clinicians, coordinators and managers;
- Acute care, rehabilitation institution with inpatient and outpatient unit;
- Quebec and Ontario;
- One month period to complete the survey.
- Four sections in the survey:
  1) Profile of respondents
  2) Knowledge/perception of CPGs
  3) Content and format of CPG
  4) Implementation process

- Target end-users: All clinicians, physicians, clinical coordinators and managers of TBI programs in acute care settings and rehabilitation facilities in Quebec and Ontario.
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Frequency (n)</th>
<th>Percentage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eligible</td>
<td>487</td>
<td>95</td>
</tr>
<tr>
<td>Quebec</td>
<td>251</td>
<td>56</td>
</tr>
<tr>
<td>Ontario</td>
<td>194</td>
<td>44</td>
</tr>
<tr>
<td>Male</td>
<td>72</td>
<td>16</td>
</tr>
<tr>
<td>Female</td>
<td>383</td>
<td>84</td>
</tr>
<tr>
<td>Acute hospital (early rehabilitation)</td>
<td>109</td>
<td>22</td>
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<tr>
<td>Rehabilitation institution with inpatient unit</td>
<td>256</td>
<td>53</td>
</tr>
<tr>
<td>Rehabilitation institution without an inpatient unit</td>
<td>120</td>
<td>25</td>
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<tr>
<td>Management position</td>
<td>37</td>
<td>8</td>
</tr>
<tr>
<td>Clinical coordinator position</td>
<td>45</td>
<td>10</td>
</tr>
<tr>
<td>Clinical position (including physicians)</td>
<td>389</td>
<td>83</td>
</tr>
</tbody>
</table>
Overview of the Survey Results

- A large proportion of the respondents (53%) were not aware of any CPGs for the rehabilitation of adults with MSTBI;
- Identification of relevant topics;
- Comments and suggestions regarding new elements (e.g. elderly patients);
- Key implementation process elements.
Stakeholder consultation: Guidelines perceptions

- 47% of participants knew about at least one TBI CPG...
  - ...but they rate as «very low» (mean: 3.5/10) the frequency of its use in their practice
- Participants have positive opinions about CPGs (mean: 7.6/10)...
  - ... but they feel moderately well equipped (5.7/10) to use the CPG in their practice
# Stakeholder consultation: Guidelines topics

<table>
<thead>
<tr>
<th>Response</th>
<th>Chart</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access mechanisms</td>
<td></td>
<td>25%</td>
<td>78</td>
</tr>
<tr>
<td>Continuity-of-care mechanisms</td>
<td></td>
<td>59%</td>
<td>183</td>
</tr>
<tr>
<td>Coordination mechanisms</td>
<td></td>
<td>36%</td>
<td>111</td>
</tr>
<tr>
<td>Duration of interventions</td>
<td></td>
<td>66%</td>
<td>204</td>
</tr>
<tr>
<td>Length of stay</td>
<td></td>
<td>36%</td>
<td>113</td>
</tr>
<tr>
<td>Intensity / frequency of interventions</td>
<td></td>
<td>79%</td>
<td>246</td>
</tr>
<tr>
<td>Rehabilitation models or reference frameworks</td>
<td></td>
<td>74%</td>
<td>229</td>
</tr>
<tr>
<td>Program evaluation measures</td>
<td></td>
<td>44%</td>
<td>137</td>
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</table>

**Total Responses**: 310
<table>
<thead>
<tr>
<th>Response</th>
<th>Chart</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence and prevalence of TBI and its associated conditions</td>
<td></td>
</tr>
<tr>
<td>General physical health</td>
<td></td>
</tr>
<tr>
<td>TBI-related conditions (e.g.: heterotopic ossification)</td>
<td></td>
</tr>
<tr>
<td>Epilepsy and other neurological disorders</td>
<td></td>
</tr>
<tr>
<td>Endocrine disorders</td>
<td></td>
</tr>
<tr>
<td>Vestibular and sensory impairments</td>
<td></td>
</tr>
<tr>
<td>Diet and nutrition</td>
<td></td>
</tr>
<tr>
<td>Motor impairments</td>
<td></td>
</tr>
<tr>
<td>Cognitive function impairments</td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td></td>
</tr>
<tr>
<td>Behaviour disorders</td>
<td></td>
</tr>
<tr>
<td>Orthotic devices and technical aids</td>
<td></td>
</tr>
<tr>
<td>Positioning and mobility</td>
<td></td>
</tr>
<tr>
<td>Pain management</td>
<td></td>
</tr>
<tr>
<td>Fatigue and sleep disturbances</td>
<td></td>
</tr>
<tr>
<td>Sexuality</td>
<td></td>
</tr>
<tr>
<td>Mental health (psychological and emotional conditions)</td>
<td></td>
</tr>
<tr>
<td>Pharmacological treatments</td>
<td></td>
</tr>
<tr>
<td>Substance abuse</td>
<td></td>
</tr>
<tr>
<td>Alternative medicine (e.g.: acupuncture)</td>
<td></td>
</tr>
<tr>
<td>TBI education</td>
<td></td>
</tr>
<tr>
<td>Vegetative state and individuals with low potential for recovery</td>
<td></td>
</tr>
</tbody>
</table>
**Stakeholder consultation: Guidelines topics - later**

<table>
<thead>
<tr>
<th>Response</th>
<th>Chart</th>
<th>Percentage</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Psychosocial strategies</td>
<td></td>
<td>50%</td>
<td>151</td>
</tr>
<tr>
<td>Sport and physical activity</td>
<td></td>
<td>25%</td>
<td>76</td>
</tr>
<tr>
<td>Social participation and community life</td>
<td></td>
<td>68%</td>
<td>204</td>
</tr>
<tr>
<td>Leisure activities</td>
<td></td>
<td>29%</td>
<td>88</td>
</tr>
<tr>
<td>Caregiver support</td>
<td></td>
<td>57%</td>
<td>173</td>
</tr>
<tr>
<td>Skill maintenance and quality of life</td>
<td></td>
<td>62%</td>
<td>187</td>
</tr>
<tr>
<td>Activities of daily living</td>
<td></td>
<td>40%</td>
<td>122</td>
</tr>
<tr>
<td>Household activities</td>
<td></td>
<td>21%</td>
<td>62</td>
</tr>
<tr>
<td>Home adaptations</td>
<td></td>
<td>17%</td>
<td>52</td>
</tr>
<tr>
<td>Work, school and productivity</td>
<td></td>
<td>58%</td>
<td>176</td>
</tr>
<tr>
<td>Driving and travelling</td>
<td></td>
<td>32%</td>
<td>98</td>
</tr>
<tr>
<td>Responsibilities</td>
<td></td>
<td>23%</td>
<td>70</td>
</tr>
<tr>
<td><strong>Total Responses</strong></td>
<td></td>
<td><strong>302</strong></td>
<td></td>
</tr>
</tbody>
</table>
**Stakeholder consultation:**

They would like:

- Specific recommendations (who, when, how)
- Training (case histories, workshops, discussions), accessible CPG (electronic/paper copies) and team-use of the CPG (56%)
- Designated time to read and understand the CPG
- Program champion / resource person
- Follow-up (continual training)
The next steps for the projects

1. Scoping review and quality evaluation of existing CPGs
2. Survey of end-users’ needs and expectations
3. Synthesis of all existing information
4. Expert consensus
5. Implementation of the CPG in the clinical settings
Objective 3

• To be able to access some existing best practice resources/guidelines that may be helpful
Synthesis and Guidelines: What's the difference?

• Research Syntheses
  ▫ Standardized reviews of the literature
  ▫ Designed to rate the quality of the evidence itself and come to a conclusion regarding the level of evidence for ERABI.

• Practice Guidelines
  ▫ Incorporate the research evidence along with clinical experience to make recommendations on optimal practices
Evidence-Based Review of Moderate to Severe Acquired Brain Injury (ERABI)

- Freely accessible online review (www.abiebr.com)
- Joint project involving researchers in three centers
- 10th edition in process of being completed

The aim of the ERABI is to:

- Be an up-to-date review of the current evidence in ABI rehabilitation
- Provide a comprehensive and accessible review to facilitate best-practices
- Provide specific conclusions based on evidence that could be used by clinicians to help direct the care of ABI patients at the bedside and at home.
**ERABI Purpose:** To conduct a systematic review of the rehabilitation literature of moderate to severe acquired brain injuries (ABI) from traumatic and non-traumatic causes.

### Step 1: Systematic Literature Search

+ 6000 references reviewed

### Inclusion Criteria:

- Intervention based study
- ≥ 50% of participants have a moderate to severe ABI
- Published in English
- Articles from 1980 – Present
- ≥3 participants

### Step 2: Article Analysis

798 Selected for careful data abstraction and quality determination.

Studies are tabled: Study design, study population, intervention and outcomes

RCTs are appraised using the PEDro Scale

### Step 3: Conclusion Statements

Statement s about the effectiveness of interventions are made and levels of evidence are assigned for each
798 articles selected for careful data abstraction and determination of study quality

<table>
<thead>
<tr>
<th>Research Design</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Randomized controlled trial (RCT) – high quality</td>
<td>143</td>
</tr>
<tr>
<td>RCT – low quality, Non-RCT, Prospective controlled trial, Cohort</td>
<td>214</td>
</tr>
<tr>
<td>Case control</td>
<td>57</td>
</tr>
<tr>
<td>Pre-post, Post-Test, Case Series</td>
<td>297</td>
</tr>
<tr>
<td>Observational, Case Report, Clinical Consensus</td>
<td>87</td>
</tr>
<tr>
<td>Total</td>
<td>798</td>
</tr>
</tbody>
</table>
## PEDro Scale for Assessment of RCT Quality

### RCTs
- Scored using the Physiotherapy Evidence Database (PEDro) rating scale (Moseley et al. 2002).

### Study Scores:
- 9-10 = Excellent Quality
- 6-8 = Good Quality
- 4-5 = Fair Quality
- <4 = Poor Quality

Studies employing a non-experimental or uncontrolled design were used to formulate conclusions only in the absence of RCTs.

### PEDro Quality Assessment Table

<table>
<thead>
<tr>
<th>PEDro Quality Assessment</th>
<th>Yes</th>
<th>No</th>
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</thead>
<tbody>
<tr>
<td>Random Allocation</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Concealed Allocation</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Baseline Comparability</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Between Group Comparisons</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>Blinded Subjects</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Blinded Therapists</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Blinded Assessors</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Adequacy of Follow-up</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Intention-to-Treat Analysis</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Point Estimates and Measures of Variability</td>
<td></td>
<td>x</td>
</tr>
<tr>
<td>Total Score</td>
<td>6</td>
<td></td>
</tr>
</tbody>
</table>

Studies employing a non-experimental or uncontrolled design were used to formulate conclusions only in the absence of RCTs.
Step 3: Assign Level Of Evidence

Levels of Evidence: Modified Sackett Scale (Straus et al. 2005)

<table>
<thead>
<tr>
<th>Level of Evidence</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Level 1a</td>
<td>2 or more RCTs with PEDro scores ≥ 6.</td>
</tr>
<tr>
<td>Level 1b</td>
<td>1 RCT with a PEDro score ≥ 6</td>
</tr>
<tr>
<td>Level 2</td>
<td>RCT (PEDro score &lt; 6), Prospective Controlled Trials, and Cohort studies</td>
</tr>
<tr>
<td>Level 3</td>
<td>Case-Control</td>
</tr>
<tr>
<td>Level 4</td>
<td>Pre-Post or Post-Study test, and Case Series</td>
</tr>
<tr>
<td>Level 5</td>
<td>Observational Study and Clinical Consensus</td>
</tr>
<tr>
<td>Conflicting</td>
<td>Studies with results that contradict each other</td>
</tr>
</tbody>
</table>
ERABI: Modules

- 19 Evidence Modules
  - Updated reviews by topic
  - PDF versions for download
Evolution of ABI Research

- 143 RCTs from 1980 to 2012
- Largest portion of ABI RCTs are published by authors in USA (62.8%)
- Cognitive and communication accounts for 41.9% of the RCTs
- 48% scored 4-5 on the PEDro Scale (‘fair’ quality)
- Approximately 32% of all RCTs were published recently (2008-2012)
Quality of Current Guidelines

CLINICAL PRACTICE GUIDELINE
FOR THE REHABILITATION OF ADULTS WITH MODERATE TO SEVERE TBI
Methodology

Identification
- 514 documents found in databases
- 41 documents found in the grey literature

Screening
- 553 documents screened
- 472 documents excluded

Eligibility
- 84 documents selected
- 75 documents excluded

Included
- 9 documents selected
<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Author/Organization</th>
<th>Country</th>
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<tbody>
<tr>
<td>2006</td>
<td>Guidelines for the Pharmacologic Treatment of Neurobehavioral Sequelae of Traumatic Brain Injury</td>
<td>Neurobehavioral Guidelines Working Group (NGWG)</td>
<td>United States</td>
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<tr>
<td>2006</td>
<td>Traumatic Brain Injury; Diagnosis, acute management and rehabilitation</td>
<td>New Zealand Guidelines Group (NZGG)</td>
<td>New Zealand</td>
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<tr>
<td>2007</td>
<td>ABIKUS evidence-based recommendations for rehabilitation of moderate to severe acquired brain injury</td>
<td>Acquired Brain Injury Knowledge Uptake Strategy (ABIKUS)</td>
<td>Canada</td>
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<tr>
<td>2009</td>
<td>Occupational Therapy Practice Guidelines for Adults with Traumatic Brain Injury</td>
<td>American Occupational Therapy Association (AOTA)</td>
<td>United States</td>
</tr>
<tr>
<td>2011</td>
<td>A guideline for vocational evaluation following traumatic brain injury: a systematic and evidence-based approach</td>
<td>Stergiou-Kita, M.</td>
<td>Canada</td>
</tr>
<tr>
<td>2011</td>
<td>Depression in moderate to severe TBI</td>
<td>Accident compensation corporation (ACC)</td>
<td>New Zealand</td>
</tr>
<tr>
<td>2011</td>
<td>Aging in moderate to severe TBI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>Brain injury rehabilitation in adults</td>
<td>Scottish Intercollegiate Guidelines Network (SIGN)</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>2013</td>
<td>Prolonged Disorders of Consciousness National Clinical Guidelines</td>
<td>Royal College of Physicians (RCP)</td>
<td>United Kingdom</td>
</tr>
<tr>
<td>2014</td>
<td>INCOG Guidelines for Cognitive Rehabilitation Following Traumatic Brain Injury</td>
<td>INCOG Team</td>
<td>Canada / Australia</td>
</tr>
</tbody>
</table>
AGREE Methodology

- A scoping review using multiple databases
- The Appraisal of Guidelines for Research and Evaluation II (AGREE II) instrument
- Independently evaluated by four appraisers
Domain 3: Rigour of Development

Clinical Practice Guidelines

- NZ (2006) 63.54
- Kita (2011) 70.83
- SIGN (2013) 93.75
- ACC (2011) 20.31
- AOTA (2009) 67.71
- Warden (2006) 54.17
- ABIKUS (2007) 72.92
- RCP (2013) 47.22
- INCOG (2014) 86.11

* Indicates passing score.
Mean Guideline Rating

<table>
<thead>
<tr>
<th>Clinical Practice Guideline</th>
<th>Score (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NZ (2006)</td>
<td>75.00</td>
</tr>
<tr>
<td>Kita (2011)</td>
<td>83.33</td>
</tr>
<tr>
<td>SIGN (2013)</td>
<td>83.33</td>
</tr>
<tr>
<td>ACC (2011)</td>
<td>29.17</td>
</tr>
<tr>
<td>AOTA (2009)</td>
<td>50.00</td>
</tr>
<tr>
<td>Warden (2006)</td>
<td>54.17</td>
</tr>
<tr>
<td>ABIKUS (2007)</td>
<td>66.67</td>
</tr>
<tr>
<td>RCP (2014)</td>
<td>66.67</td>
</tr>
<tr>
<td>INCOG (2014)</td>
<td>83.33 *</td>
</tr>
</tbody>
</table>
Objective 4

• Name some best practices that address important issues for QOL
Problems illustrated by Lisa's Case

- Irritability
- Memory
- Fatigability
- Cognitive communication
- Social cognition
- Vocational return
- Executive skills
Early rehabilitation - Problems with Irritability

- **Recommendation:** Support should be provided for caregiver/family, including:
  - *Training and education for the caregiver role*
  - *Training in behavioural management techniques when the person with traumatic brain injury has behavioural and personality changes resulting from the traumatic brain injury*  
    
    (Adapted from ABIKUS guidelines, NZGG)

- Lisa's husband is provided with education about the signs of irritability and after working with the team to do an antecedent analysis recognizes that Lisa is irritable when she is tired, has slept poorly or if they spend longer than 1.5 hours in busy environment such as public places
Early rehab - Problems with Fatigue

Recommendations

- Clinicians should also consider the possibility of brain injury related sleep disorders as a cause of cognitive and other behavioural changes. (ABIKUS)

- Clinicians should assess individuals for Neuroendocrine dysfunction

• Lisa is found to be hypothyroid and feels little better

• Lisa is taught about sleep hygiene
Generalization of learned activities into Community

• *Recommendations* - In order to facilitate/achieve generalization of skills/strategies to daily activities, rehabilitation should:
  – *Focus on engaging in activities that are perceived as meaningful*
  – *Include therapy interventions in the affected person’s own environment and/or application to the person’s own life.* *(ABIKUS 2007)*

• Lisa’s therapist take her to the gym and she gets into a routine that she follows
Cognitive Communication

• communication impairments resulting from underlying cognitive deficits due to neurological impairment

• difficulties in communicative competence (listening, speaking, reading, writing, conversation, and social interaction) that

• result from underlying cognitive impairments (attention, memory, organization, information processing, problem solving and executive functions). (CASLPO)
Cognitive Communication rehab should provide opportunity to rehearse communication skills in situations appropriate to where patients will live, work, study, and socialize after discharge.

Assess/Consider premorbid native language, literacy, language proficiency; communication style, cultural expectations, fatigue and personal factors.

Consider communication partner, environment, and demands.

Interventions optimal for community living individuals (> 6 months post moderate to severe TBI) without neglect, psychosis, or substance abuse.

Patient identified goals for social communication?

Provide training to communication partners.

Teach partners to ask questions in a positive, non-demanding manner; encourage discussion of opinions e.g. TBI Express program.

Tailor therapy to individual’s learning ability.

Group-based intervention (+/- individual) with involvement of communication partners.

Social Skills training

Conversational skills training

*See Stroke Guidelines

IMPAIRED COMMUNICATION?

Referral to SLP

Yes

Aphasia

Treat Aphasia*

No

Severe Communication Deficit?

Yes

Augmentative Device + training in use

No

*See Stroke Guidelines
A cognitive-communication rehabilitation program should provide the opportunity to rehearse communication skills in situations appropriate to the context in which the individual will live, work, study, and socialize. (Adapted from ABIKUS)
Social cognition

• Social cognition includes processes such as emotion recognition from facial affect and voice and Theory of Mind, the belief that others have thoughts separate from one’s own and that these thoughts influence others’ behaviors.

Social cognition

• Treatment research is beginning to emerge.
• 3 published RCTs focusing on emotion recognition and recognition of social inference.
• Results showed benefits of training, and in one case, affect recognition training generalized to improvements in social interactions beyond the study.
• Lisa and her husband learn strategies to recognize affect recognition.
Memory

INCOG algorithm

Assess Severity

Severe
- Consider Acetylcholinesterase inhibitors
- Consider External Memory Device(s) / Strategies
  - Assess Patient characteristics, functional needs, preferences
  - Select appropriate device(s) / Strategies
  - Use Key instructional practices to teach and implement external device(s) / strategies

Mild / Moderate
- Select Combination
  - Consider External Compensatory Device(s) / Strategies
  - Assess Patient characteristics, functional needs and preferences
  - Select appropriate device(s) / Strategies
  - Choose group or individual format
  - Use Key instructional practices to teach implementation of internal and/or external device(s) / strategies

- Consider Internal Compensatory Strategies
  - Consider restorative strategy only in combination with internal/external strategies transfer to functional task and completed with therapist
INCOG Memory recommendation #1

• Teaching internal compensatory strategies may be used for TBI patients who have mild to moderate memory impairments. These strategies include:
• instructional and/or metacognitive strategies for example:
  – visualization/visual imagery,
  – repeated practice,
  – retrieval practice,
  – PQRST (Preview, Question, Read, Self-Recitation, Test),
  – self-cueing, self-generation, self-talk, et
• Utilizing multiple strategies is considered effective
• strategies can be taught individually or in a group format (adapted from ABIKUS)
INCQG Memory #4. Key instructional practices that can promote learning for individuals with memory impairments

- Clearly define intervention goals
- Break down tasks into smaller components when training multi-step procedures
- Allow sufficient time and opportunity for practice
- Use principles of distributed practice
- Teach strategies using variations in the stimuli/information being presented (e.g., multiple exemplars, practical tasks)
- Promote strategies that allow for more effortful processing of information/stimuli (e.g., verbal elaboration; visual imagery, etc.)
- Selection of and train to goals that are relevant to the patient (i.e., ecologically validity)
- Use teaching strategies that constrain errors (e.g., errorless, spaced retrieval, etc.) when acquiring new or relearning information and procedures
Lisa

- Commences use of her iPhone
- Lets move into the 21\textsuperscript{st} century!
- taught some internal strategies for memory in her own environment
Behavioural changes/irritability

- Lisa and her husband have learned to avoid the busy malls however find it somewhat limiting their lifestyle
- Recommend **Serotonin Reuptake Inhibitors** for Episodic Behavioural or Emotional Dyscontrol following TBI. Specifically, **Sertraline** (25-200 mg/day) and **Paroxetine** (20 mg/day) have been reported to be effective (ABIKUS 2007 and NGWG)
- A small dose of sertraline 25 mg is added and the irritability improves well.
Interpersonal Relationships

• A discussion about sexuality, initiated by the provider, should cover both physical aspects (e.g., positioning, sensory deficits, erectile dysfunction, drugs, disruption to menstrual cycle) and psychological aspects (e.g., communication, fears, altered roles, disinhibition, threats to safety, and sense of attractiveness). (adapted from NZGG 2007, 6.5, p. 113)
Vocational Rehab

• People with traumatic brain injury should be assessed for the need for vocational rehabilitation to assist their return to work, or for entering the workforce for those not previously employed, and vocational rehabilitation should be provided to those found to need it. (NZGG)
Vocational Pre-Assessment (Stergiou-Kita et al)

- The evaluator should complete an assessment of the environmental supports and barriers to work or return to work. This should include an assessment of the following domains:
  1. the physical workplace environment
  2. the work culture
  3. social supports and opportunities available to the individual both within the workplace and his/her network

1. Assessment of the physical workplace environment should include:
   - light, noise, level of distractions, temperature control outdoor/indoor work proximity to co-workers (e.g. in relation to both supports and possible distractions)
   - proximity to supervision length of working day and flexibility in scheduling work hours potential risks in the work environment (e.g. heights, dangerous machinery, heavy lifting)
   - travel required and the effect of travel on work performance
Vocational assessment (Kita)

2. Assessment of the work culture should include identification of whether or not a workplace and its employees demonstrate the following attributes:

- tolerances for differences amongst employees positive attitudes towards individuals with disabilities (e.g. an environment free of harassment and discrimination)
- an understanding of or willingness to learn about TBI
- a willingness to provide accommodations and/or job modifications
- a willingness to involve employment specialists in a collaborative work planning process opportunities for social participation and team work
3. Assessment of supports and opportunities within the workplace and the individual’s network should include:

- availability of accommodations and/or job modifications in relation to:
  - work activities, work hours, and graduated return to work
  - workstation modifications (including reductions to distractions)
  - adaptive aids/devices and opportunities to apply compensatory strategies
- the identification of individual(s) able to provide on-going assessment and feedback of the individual’s work performance
- availability of instrumental support from the community such as family, volunteer or hired supports (e.g. housekeeping etc)
- availability of transportation supports and services,
Supported Employment (NZGG)

Should include these fundamental aspects:

a. job placement, including matching job needs to abilities and potential and facilitating communication
b. job site training and advocacy by the job coach
c. job retention and follow-up by the job coach including: monitoring of progress to anticipate problems and intervene proactively when necessary.
Lisa

• With education the employer recognizes Lisa's situations that are problematic and prompts her when she observes issues.

• Lisa receives training in certain metacognitive strategies and adopts the use of these on a daily basis that she uses regularly.
Executive Skills
INCOG Recs

#E1: Metacognitive strategy instruction (MSI) is step-by-step procedures that train:
- Goal setting & selection
- Creating general/specific plans
- Selecting & using strategies
- Self-assessing (i.e., self-monitoring)
- Adjust goal and/or plan

#E2: Gist reasoning therapy

#E4: Group-based problem solving/planning

Outcomes measured as functional changes in activities that clients identified as personal goals.
These activities include:
- Complex activities that involve planning and adjusting to feedback
- Can be reported by client and/or other person (e.g., co-worker, spouse)

Post-acute recovery phase
- Out of post-traumatic amnesia?
- Able to identify functional need?

Assess executive function skills & gather information via tests, behavioral questionnaires, interview, behavioral observation, reports from others

Aware of deficits?
Motivated?

YES →

NO → Reassess at later time

YES →

#E3: Educate client &/or engage in experiential therapy to improve awareness & motivate
Lisa

- Avoids layoffs despite impairments
- Continues to require ongoing employment of techniques
- Now hoping to start a family.
Conclusions

1. The most problematic issues for people long-term after brain injury are related to depressed mood, cognitive and emotional changes, vocational activity/productivity and interpersonal relationships.

2. Healthcare providers priorities issues for guidelines included: optimal intensity and duration of intervention, interventions for mental health issues, behavioral changes and cognition.

3. There are a number of best practice resources including: the ERABI, INCOG guidelines, vocational guidelines as well as the upcoming ONF-INESS TBI guidelines.

4. Implementation of available strategies and best practices has the potential to improve outcomes for people with brain injury.
QUESTIONS?

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