TRAC Group Inc.
Concussion Rehabilitation Services

Presented to:
Sports Medicine Rounds hosted by Carleton University Sports Medicine Clinic

Presented by:
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TRAC Group Inc.

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TRAC Group Inc.

Established in 1996

Co-founded by Regulated Health Professionals

3 Divisions:
• **Medical Rehabilitation**
• Disability Management
• Student Success Services

Head Office: Ottawa
Satellite Offices: Sudbury, North Bay, Kingston, GTA, Pembroke & Barrie
Mission

To facilitate successful and enduring return to meaningful activities for individuals following illness or injury in the environments in which they live, work and play.

Community-Based

Multidisciplinary

Inter-Professional Collaboration
Funding Sources

Auto Insurance

Long-term Disability Benefits

Extended Health Benefits

Active Military Personnel

Veterans Affairs Canada

Academic Institutions & Associated Funding (BSWD)

WSIB*

Champlain CCAC Overflow Provider

Direct Consumer
TRAC Roster

- Registered Nurses
- Occupational Therapists
- Speech Language Pathologists
- Physiotherapists
- Kinesiologists
- Social Workers & Counsellors
- Behavioral Therapists
- Vocational Evaluators & Consultants
- Rehabilitation Aids/Life Skills Workers
- Teachers/Tutors
2002

Community Traumatic Brain Injury Rehabilitation Program

- Roster of Professionals with Requisite Expertise
- Admission Criteria
- Evidence-based Practice Guidelines
- Communication & Collaboration Protocols
- Functional Outcome Measures
TRAC
Concussion Management

September 2013 -
Guidelines for Concussion/mTBI & Persistent Symptoms: Second Edition

12 Modules

Diagnosis/Assessment of Concussion/mTBI
Management of Concussion/mTBI
Sports-related Concussion/mTBI
General Recommendations Regarding Diagnosis/Assessment of Persistent Symptoms
General Recommendations Regarding Management of Persistent Symptoms
Post-Traumatic Headache
Persistent Sleep/Wake Disturbances
Persistent Mental Health Disorders
Persistent Cognitive Difficulties
Persistent Vestibular (Balance/Dizziness) & Vision Dysfunction
Persistent Fatigue
Return-To-Activity/Work/School Considerations
Diagnosis & Assessment: Medicine

• Referral

• Confirmed Diagnosis
  – Physician (GP, ER, Sports Medicine, Physiatrist, Neurologist)
  – Neuropsychologist

• Screening
  – Interview + Grading Scale/Checklist
  – Consultation with Physician
  – Confirm Diagnosis
Post-Concussion Symptom Management

Concussion

Early
< 3-4 months

Persistent Symptoms
>3-4 months
Early Intervention

History

- Current & Prior Injur(ies)
- Medical
- Medication(s)
- Mental Health
- Learning/Cognition
- Educational/Vocational

Functional Problem List

Baseline of Symptoms

- Post Concussion Impact Questionnaire
- Post Concussion Symptom Grading Scale
Early Intervention

1-2 sessions*

Education & Follow Up (if required)

Individualized pacing, time-management

Functional compensatory strategies

Reduced ‘anxiety’ & symptom-focus

Improved ‘attention/concentration’

Improved activity pacing
Client Education

• Educational materials and concepts:
  – Client Family Handbook
  – Pacing systems
  – Weekly schedules
  – Tracking sheets
  – Feedback forms
Persistent Symptoms

Symptom Management Approach

Inter-professional Collaboration:

- Medicine
- Speech Language Pathology
- Physiotherapy
- Occupational Therapy
- Psychology
- Pain Management
- Behavioral Therapy
- Vocational Rehabilitation
Cognitive-communication disorders are communication impairments resulting from underlying cognitive deficits due to neurological impairment. These are 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)…Cognitive-communication disorders are commonly associated with traumatic brain injury (TBI) but can also occur as a result of other acquired brain injuries (ABI) such as haemorrhages, stroke, meningitis, encephalitis, anoxia, or tumours.
Speech Language Pathology

Symptoms Related to...

Attention/Concentration
Memory (auditory-verbal, reading)
Information Processing
Word-Finding
Verbal Formulation/Organization
Reasoning, Problem-Solving
Decision-Making
Cognitive Endurance (Fatigue)
Speech Language Pathology

Approach...
Education & Self-Monitoring
Compensatory Strategies
Adaptive Aids
Stimulation/Facilitation/Practice
Cognitive Pacing & Time Management
Cognitive Endurance Building

Other Factors to Consider....
Funding
Vocational Demands
Learning/Cognition History
Physiotherapy

Vestibular Training

Concussion can be associated with balance deficits and postural instability \(^{1,2,3}\)

**Treatment** \(^{4}\)

- Canalith repositioning – Dix-Hallpike or Head roll test dictate
- Balance exercises
  - can incorporate visual training exercises
- Vestibular Ocular reflex (VOR) exercises
  - Substitution exercises – move eyes to a target and then head
  - VOR exercises – keep focused on target while shaking head back and forth
- Core stability exercises
- Gait exercises
Cervical Spine Dysfunction

Concussion can be associated with cervicogenic headaches.  

- Associated with: dizziness, tinnitus, nausea, imbalance, hearing complaints and ear/eye pain.

**Treatment:**  
- Range of Motion – unidirectional and/or combined movements  
- Mobilizations – as per assessment findings  
- Deep Neck Flexor/Extensor (DNF/DNE) training  
  - Management of muscle imbalances.  
- Muscle Extensibility Exercises – Stretching and Muscle energy techniques.  
- Postural correction  
- Cervical Proprioception – Head repositioning exercises, vestibular exercises  
- Acupuncture – Trigger point therapy
Physiotherapy

Cardiovascular Training

*Concussion can be associated with other metabolic and physiologic changes:*

- Greater HR at rest. 1
- Greater HR with physical and cognitive stresses. 2
- Greater sympathetic and lower parasympathetic nervous system activity. 3
- Decreased cerebral blood flow and disturbed cerebral auto regulation (ability to maintain CBF at relatively constant levels). 4

**Treatment** (individualized, progressive, sub-symptom threshold based) 5

- Stationary Bike
- Treadmill walking/running
- Elliptical

**Benefits:**

- Increased parasympathetic activity and improved autonomic regulation 6
- Increased global, regional and cerebral blood flow. 7
- Increased brain-derived neurotropic factor production with improved cognitive performance. 8
- Improved mood, sleep and depression 9
- Reduction in systemic markers of inflammation. 10
Occupational Therapy

Symptoms Related to...

Activity Pacing (Fatigue)

- Parkwood Pacing System
- Weekly activity chart

Visual disturbances

- sensitivity to light
- reading: paper, digital

Functional Memory

Organization

Return to Activity/Work
Occupational Therapy

Approach...
Education & Self-Monitoring
Environmental Modification
Adaptive Equipment
Compensatory Strategies
Cognitive Work Hardening
Coordination (Employer)

Other Factors to Consider....
Funding
ADL & Vocational Demands
Psychology/Psychotherapy

Symptoms Related to...
Mood
Response/Adjustment to Injury

Approach...
Education
CBT
Recommendations for Pharmacological Treatment

Factors to Consider...
Psychosocial History
Differential Diagnosis (*Dual Diagnoses*)

Neurocognitive Profile – *Nature & Severity of Injury*

Prognosis

Psychological Profile

Rehabilitation Recommendations

Baseline
The Realities of Funding...

Auto Insurance

Long-term Disability Benefits

Extended Health Benefits

Active Military Personnel

Veterans Affairs Canada

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Direct Consumer*
Case Study

Mr. W was referred to OT at TRAC Group by his LTD provider to address his ability to return to work.

Referral indicated the following:

Diagnosis: Concussion.

Date of Disability: Sept 30, 2014 (1+ year off).

Employment: Computer Programmer for Government. 1 previous failed attempt at RTW, 3 weeks post concussion.

A Job description was provided.

Mandate: Occupational therapy assessment and treatment to assist with eventual return to work.
Case Study Continued.

• Initial Assessment – things we consider before even treating:
  - How much do they already know about concussions?
  - Try to get a feel for personality type and lifestyle
  - What services/treatments have they received to date?
  - Have they been seen by a Concussion Specialist?
  - Home life – supports?
  - Type of work/barriers/job satisfaction/employer accommodating?
  - Mandate of referral and funding constraints
Case Study Continued.

• Intervention with Mr. W
  – Administration of Symptom Grading Scales = most severe symptoms are headaches when looking at the computer screen, light sensitivity, dizziness and feeling nauseas, and fatigue.
  – Visual Stress Test noted that soft purple overlays helped him to read
  – MoCA – 30/30
  – Mobility = WFL
  – Balance affected only when dizzy
  – Fatigue after 30 minutes – onset of headache 3/10 at start of sx and 7/10 at end.
  – Appears as “head of the household” – type A personality traits – has 5 kids under 18
  – Difficulty to slow down and say “no”
  – Minimal understanding for principles of pacing.
  – Mood was poor – limited patience for kids.
Case Study Continued.

Recommendations:
- Block of 8-12 OT sessions
  - Education ++ (e.g. provided with weekly activity schedule and asked to track his usual activities; schedule rest breaks; “stop before symptom stops you”)
  - Introduction on Pacing System – target points value
  - Accommodations/strategies put into place for computer use (Dragon Dictate, Screen Tinting Software, Natural Reader, Visual Breaks)
  - Activity reintegration and progressing to home based work hardening program
  - Involvement of a Vocational Rehabilitation Consultant to transition to supported community volunteer placement
  - Goal = eventual return to work modified capacity.
Case Study Continued.

• Other recommendations:
  – Referral to Dr. X, Concussion Specialist for headache management /medical management
  – Vestibular screening with PT, treatment as indicated
  – Referral to counseling
  – Worksite consultation once medically cleared for RTW
  – Onsite workplace follow up

Funding constraints = treatment discontinued if RTW goals are not feasible; OT Reports can only be released to LTD Provider
For more information....

Q & A....

www.tracgroup.ca/concussion

Tel: 1.866.526.0877 ext. 0

Email: info@tracgroup.ca
http://onf.org/system/attachments/60/original/Guidelines_for_Mild_Traumatic_Brain_Injury_and_Persistent_Symptoms.pdf
Guidelines for Mild TBI & Persistent Symptoms – First Edition

Guidelines for Concussion/mTBI & Persistent Symptoms – Second Edition

http://www.caslpo.com/Portals/0/ppg/ppg_ccd.pdf
Cognitive-communication Preferred Practice Guidelines

https://www.sjhc.london.on.ca/your-st-josephs/events/acquired-brain-injury-survivor-and-family-education-series-videoconference-se
Parkwood Pacing Points System
References


2 (Gottshall K, Drake A, Gray N, McDonald E, Hoffer ME. Objective Vestibular Tests as Outcome Measures in Head Injury Patients. The Laryngoscope. 2003; 113: 1746-1750)


5 (Baron EP, Cherian N, Tepper SJ. Role of greater occipital nerve blocks and trigger point injections for patients with dizziness and headache. Neurologist. 2011; 17(6): 312-317.)
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8(Gall B, Parkhouse W, Goodman D. Heart rate variability of recently concussed athletes at rest and exercise. Medicine and Science in Sport and Exercise. 2004; 36(8): 1269-1274.)


8 (Griesbach GS, Hovda DA, Gomez-Pinilla F. Exercise-induced improvement in cognitive performance after traumatic brain injury in rats is dependent on BDNF activation. Brain Research. 2009; 1288: 105-115.)
