

EPICREHAB

CLINICAL RESEARCH CONSORTIUM

**Interdisciplinary Rehabilitation of
Executive Dysfunction**

April 6, 2011

INTERDISCIPLINARY REHABILITATION

- The Importance of Depression in Magnification of Executive Dysfunction
 - Identifying and treating depression must be taken on as an interdisciplinary challenge.
- Remediating Executive Function Deficits
 - Defining the “just-right challenge” for adults with work disability.

DEFINITIONS

- Executive function is the ability to integrate various component cognitive abilities to produce meaningful task performance.
- Executive dysfunction is the relative inability to devise novel responses, suppress habitual responses, identify and correct errors, and plan, organize, and initiate new solutions to challenging tasks.

EF AND DEPRESSION

- Depression as an interdisciplinary challenge.
 - Definition
 - Operational / DSM-IV Diagnosis
 - Neurochemical
 - Magnification of EF and other cognitive deficits.
 - Screening vs. Diagnosis

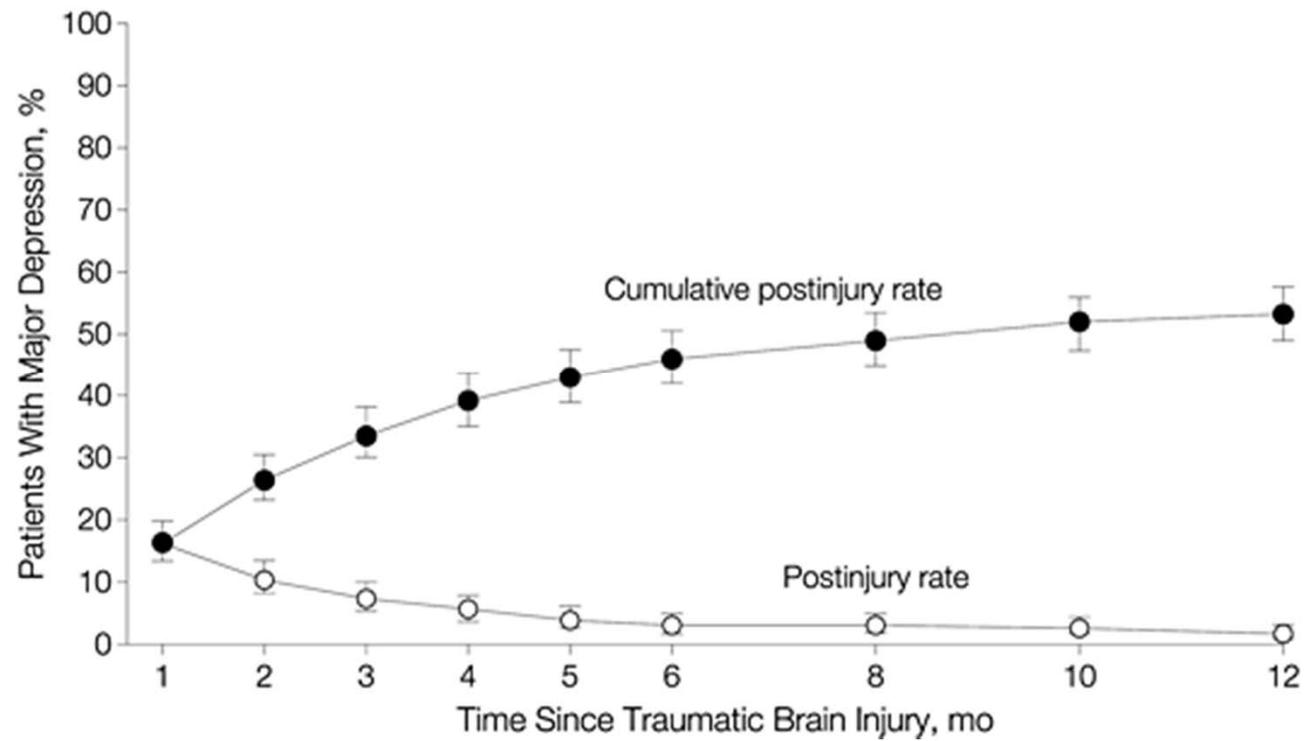
DEPRESSION - DSM-IV

- Five or more of the following, at least one of which is depressed mood or loss of interest:
 - Depressed mood;
 - Markedly diminished interest or pleasure in activities;
 - Significant weight loss;
 - Insomnia or hypersomnia;
 - Psychomotor agitation or retardation;
 - Fatigue or loss of energy;
 - Feelings of worthlessness or excessive guilt;
 - Diminished ability to think or concentrate, or indecisiveness;
 - Recurrent thoughts of death.

DEPRESSION AND TBI

- Major Depressive Disorder
 - “The 1-year cumulative rate of MDD in this study sample is 7.9-times greater than would be expected in the general population (53.1% in our cohort vs. 6.7% in the general population).”
 - Bombardier, et al. JAMA, May 19, 2010. Vol 303, No. 19

Figure 2. Rate and Cumulative Rate of Major Depression Depending on Time Since Traumatic Brain Injury (N = 559)



Bombardier, C. H. et al. JAMA 2010;303:1938-1945



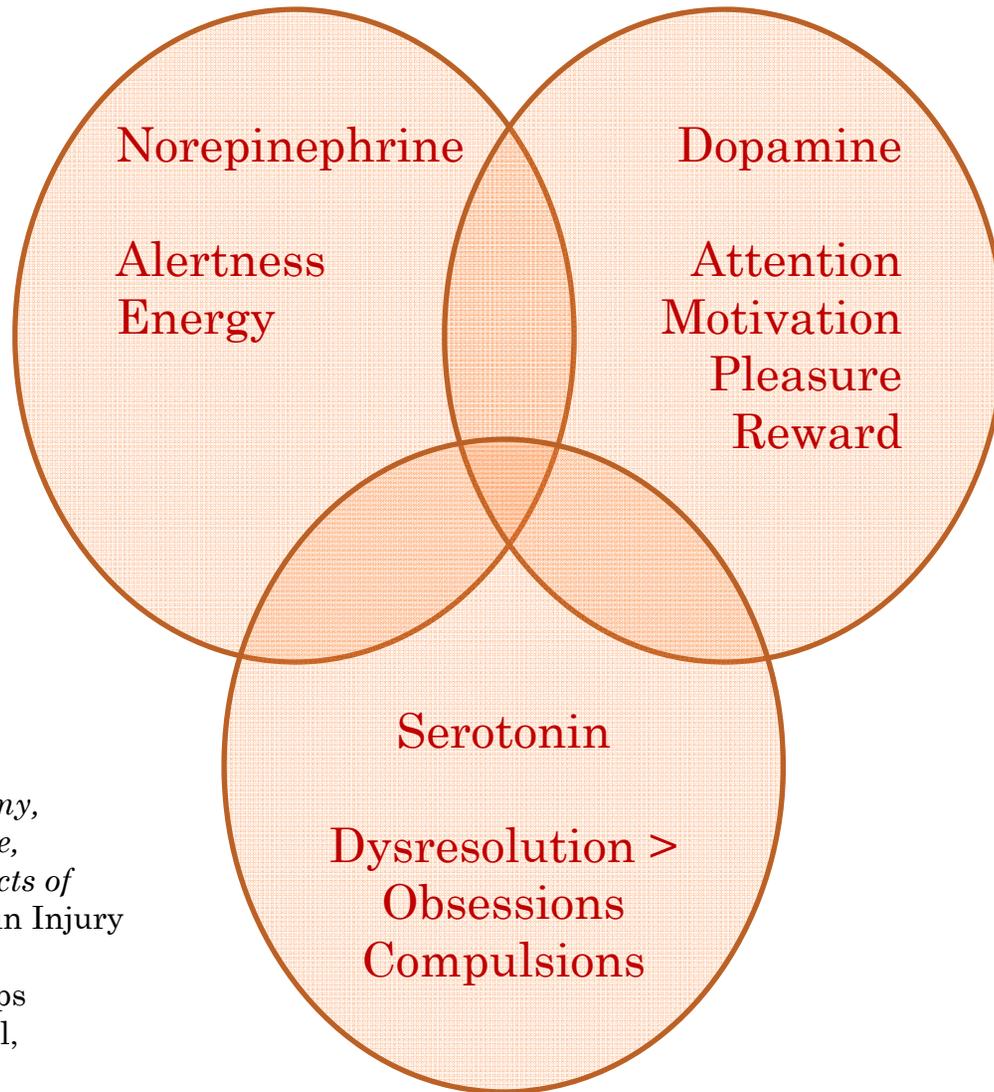
DEPRESSION

- Depression *reflects* neurochemical changes that also impair executive functions:
 - Cognitive Flexibility
 - Emotional Control
 - Initiation
 - Working Memory
 - Plan / Organize
 - Task Monitoring
 - Organization of Materials

NEUROTRANSMITTER STORM AFTER TBI

- Immediately on concussion, disruption of the neuron membranes and stretching of the axons increases potassium outside the neurons and causes depolarization and release of these neurotransmitters:
 - Dopamine
 - Norepinephrine
 - Serotonin
 - Acetylcholine
 - Glutamate

NEUROTRANSMITTER DEFICITS

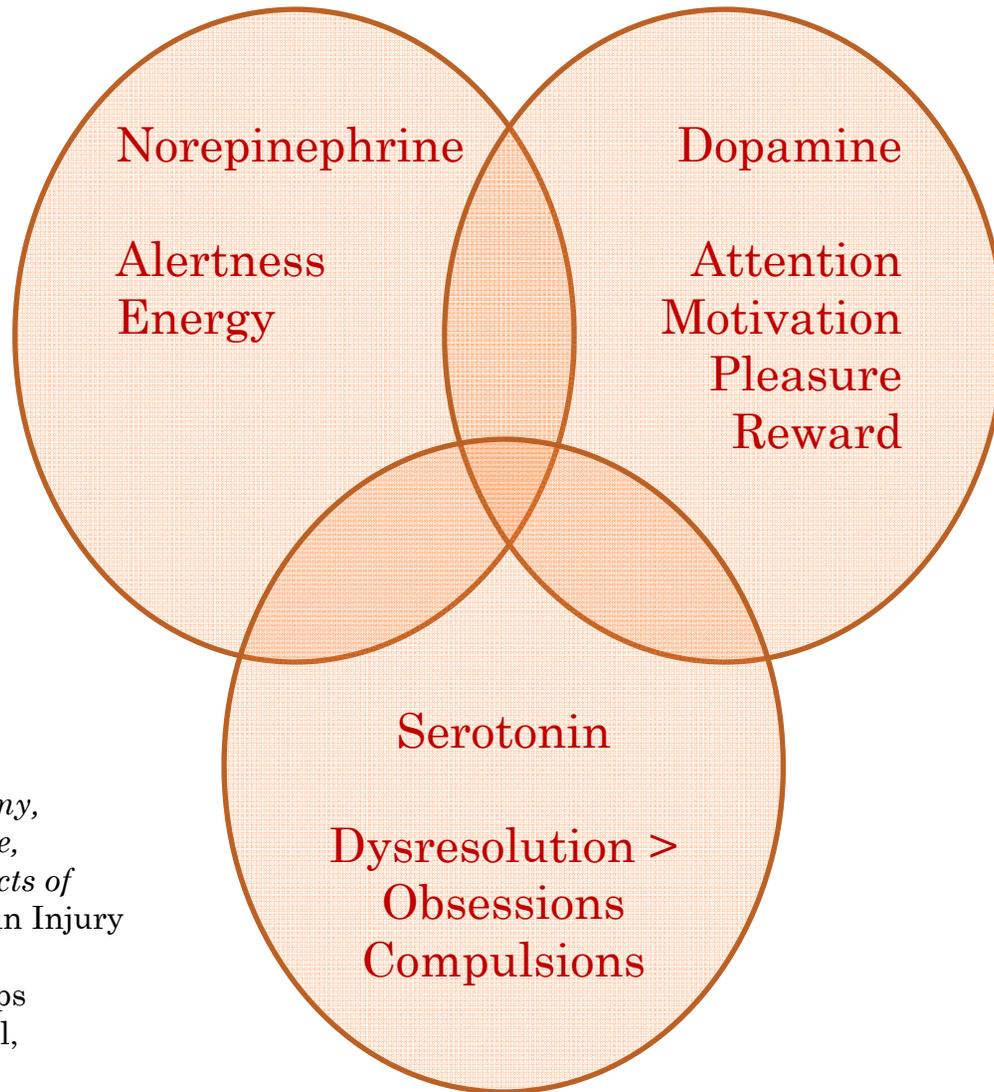


Lobatz, M. *Anatomy, Etiology, Incidence, Physiological Effects of Brain Injury*. Brain Injury Rehabilitation Conference, Scripps Memorial Hospital, Encinitas, 2011.

DEPRESSION

- Depression *creates* neurochemical changes that also impair executive functions.
 - Impulse Inhibition
 - Cognitive Flexibility
 - Emotional Control
 - Self-Awareness
 - Initiation
 - Working Memory
 - Plan / Organize
 - Task Monitoring
 - Organization of Materials

NEUROTRANSMITTER DEFICITS



Lobatz, M. *Anatomy, Etiology, Incidence, Physiological Effects of Brain Injury*. Brain Injury Rehabilitation Conference, Scripps Memorial Hospital, Encinitas, 2011.

DEPRESSION INTERVENTION

- Depression screening:
 - Beck Depression Inventory
 - 21 sections of 4 responses each
 - 5 sections relevant to EF
 - Gold standard for screening
 - “Likelihood of ...”
 - Stanford Mood Scale
 - 15 Yes – No statements
 - Focused on mood; only 2 sections relevant to EF
 - Public domain
 - <http://www.stanford.edu/~yesavage/GDS.english.short.score.html>

BECK EXECUTIVE FUNCTION ITEMS

11. Agitation

- 0 I am no more restless or wound up than usual.
- 1 I feel more restless or wound up than usual.
- 2 I am so restless or agitated that it's hard to stay still.
- 3 I am so restless or agitated that I have to keep moving or doing something.

13. Indecisiveness

- 0 I make decisions about as well as ever.
- 1 I find it more difficult to make decisions than usual.
- 2 I have much greater difficulty in making decisions than I used to.
- 3 I have trouble making any decisions.

15. Loss of Energy

- 0 I have as much energy as ever.
- 1 I have less energy than I used to have.
- 2 I don't have enough energy to do very much.
- 3 I don't have enough energy to do anything.

BECK EXECUTIVE FUNCTION ITEMS

17. Irritability

- 0 I am no more irritable than usual.
- 1 I am more irritable than usual.
- 2 I am much more irritable than usual.
- 3 I am irritable all the time.

19. Concentration Difficulty

- 0 I can concentrate as well as ever.
- 1 I can't concentrate as well as usual.
- 2 It's hard to keep my mind on anything for very long.
- 3 I find I can't concentrate on anything.

DEPRESSION INTERVENTION

- Depression is responsive to:
 - Exercise & diet & sleep
 - Goal-directed approximations of success
 - Encouragement

 - Ongoing stress
 - Unexpected failure

 - Medicine – good and bad

REMEDIATING EF DEFICITS

- “Just-Right Challenge”
 - Lessons from Education
 - Lexile calibration of reading material.
 - Self-direction of students to identify just-right challenge.
 - Goaling Process
 - Motivational Interviewing
 - Work Sample Testing
 - Normative comparisons
 - Self-referent baseline comparisons

JUST-RIGHT CHALLENGE

- “When the demands of a meaningful task slightly exceed current ability.”
- Defining the just-right challenge.
 - Lexile calibration of reading material.
 - Self-direction to identify just-right challenge:
 - “Choose a book that interests you ...
 - Read the first full page of the book ...
 - If you can read everything, choose a more difficult book ...
 - If you make more than 5 errors, choose an easier book.”

JUST-RIGHT CHALLENGE IN REHAB

- Establish meaning with client:
 - Goaling Process
 - Motivational Interviewing
- Provide demand-calibrated tasks:
 - Work Samples
 - Situational Assessments

GOALING PROCESS

- “What do you want most out of your life?”
 - Professional is scribe, providing “unconditional positive regard”.
 - 12 to 15 Goal Statements
 - Reverse prioritization
 - Publishing to 20 people with whom the client is doing life and wants to be accountable.
 - Reference:
 - Matheson, L. (1994). Functional goal setting: Foundation of the rehabilitation relationship. *American Pain Society Journal*, 3(2), 111-114.

MOTIVATIONAL INTERVIEWING

- “How can I help you? / What would you like to be different?”
 - Express empathy; understand client’s perspective.
 - Develop discrepancy; explore discrepancies between wants and behaviors and attitudes.
 - Roll with resistance; reluctance to change is natural.
 - Support self-efficacy; explicitly embrace autonomy.
 - Reference:
 - Medley, A. R., & Powell, T. (2010). Motivational Interviewing to promote self-awareness and engagement in rehabilitation following acquired brain injury: A conceptual review. *Neuropsychol Rehabil*, 20(4), 481-508.

WORK SAMPLE TESTING

○ Occupational Readiness

- Use O*NET or DOT databases or job description for information about occupational demands.
- Select tests that are relevant to occupation.
- Administer, score, and help client interpret results in terms of readiness to handle increased challenge.
- Help client identify how to improve.
- Schedule these strategies.
- Re-test when client is ready, and continue to develop occupational readiness.