



Psychiatric Issues in Traumatic Brain Injury

Establishing a Differential Diagnosis and
Identifying Effective Treatment for Individuals
with TBI and Behavioral Health Problems

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Objectives

- ★ Explain the scope of problems experienced by traumatic brain injury (TBI) patients, including behavioral health issues
- ★ Discuss effective strategies for diagnosing neurological impairment, psychiatric illness, and co-morbidity
- ★ Review conditions created by TBI that can exacerbate underlying psychiatric conditions

Objectives

- ✦ Examine clinical presentation of persons with a dual diagnosis, which includes TBI
- ✦ Examine treatment/rehabilitation implications for individuals with dual diagnosis

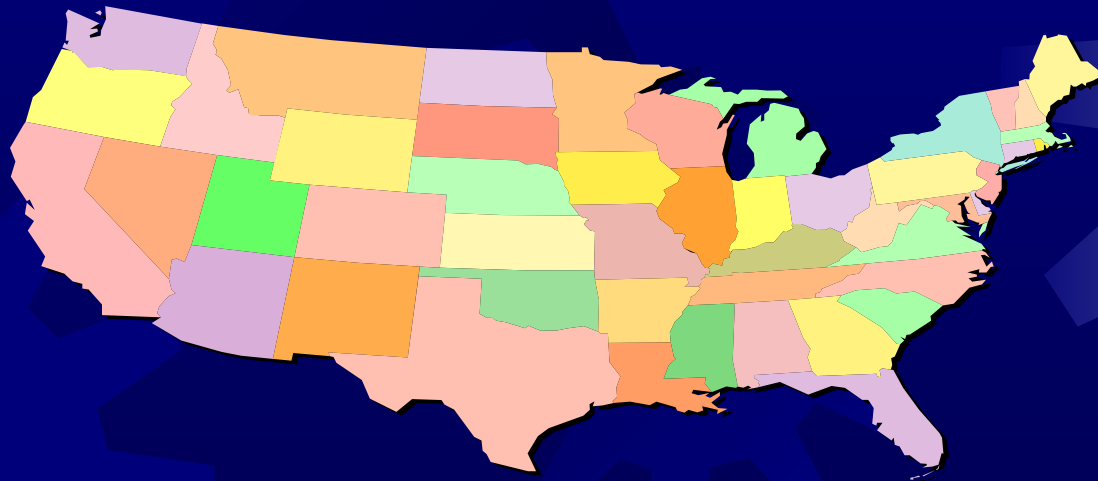
Psychiatric Issues in Individuals with TBI

- ✱ Behavioral components of TBI which resemble psychiatric illness
- ✱ Effects of brain injury on individuals with pre-existing conditions
- ✱ Issues of co-morbidity
- ✱ Diagnostic skills



Facts About Brain Injury

- ☀ Every day nearly 6,000 Americans sustain a brain injury (www.biausa.org)
- ☀ 400,000 individuals with moderate and severe brain injuries in the USA are hospitalized each year



Causes of Brain Injury

- ★ Motor Vehicle Accidents 50%
- ★ Falls 21%
- ★ Assaults 12%
- ★ Sports/Recreation 10%
- ★ Other 7%



Physical Effects of Brain Trauma in Closed Head Injuries

- ☀ Direct Impact
- ☀ Coup and Contra Coup Injuries
- ☀ Rotation and Shearing
- ☀ Swelling
- ☀ Bleeding
- ☀ Neurochemical Changes
- ☀ Secondary Effects



TBI Severity Distribution Injury

☀ Mild	85%
☀ Moderate	10%
☀ Severe	5%
☀ Mortality Rate	11%

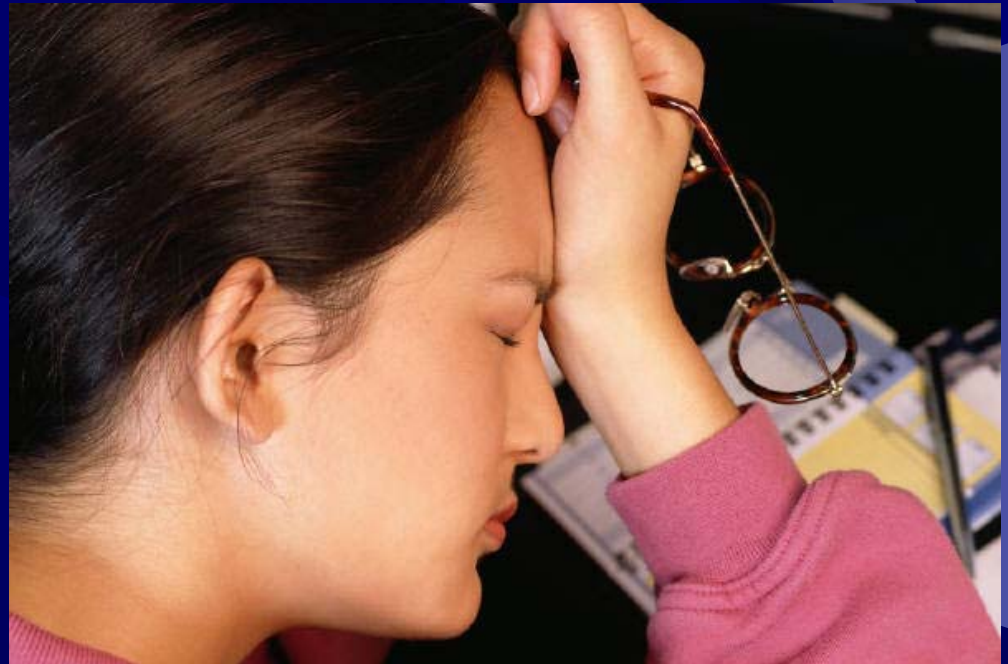


Assumptions about TBI

- ✱ Physiological impairment
- ✱ Disruption of sensorium
- ✱ Disinhibition
- ✱ Arousal and attention problems
- ✱ Unstable mood states
- ✱ Problems in learning and organization

Behaviors in Early Recovery

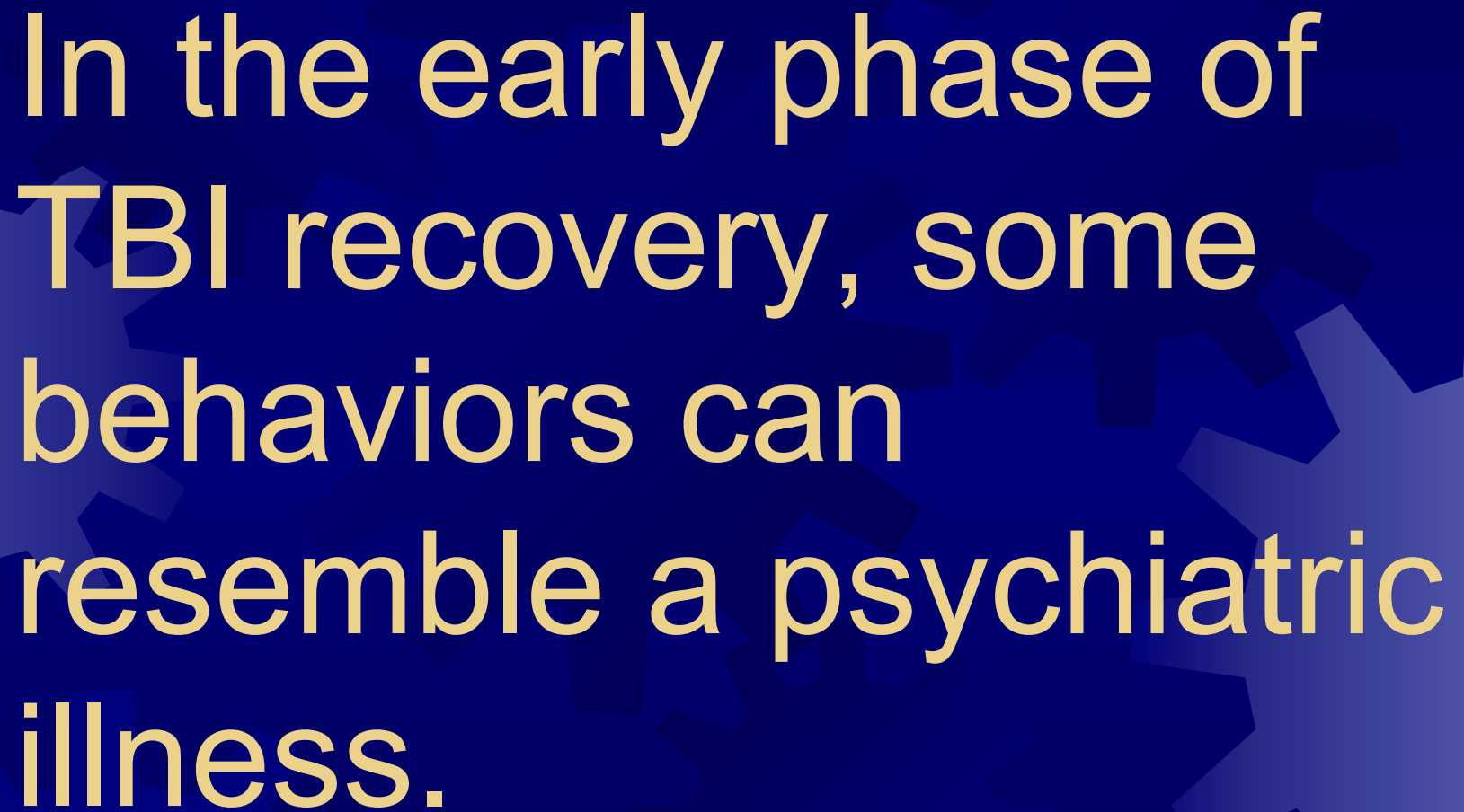
- ☀ Disorientation
- ☀ Paranoid Ideation
- ☀ Depression
- ☀ Hypomania
- ☀ Confabulation



Behaviors in Early Recovery

- ☀ Restlessness
- ☀ Agitation
- ☀ Combativeness
- ☀ Emotional Lability
- ☀ Confusion
- ☀ Hallucinations





In the early phase of
TBI recovery, some
behaviors can
resemble a psychiatric
illness.

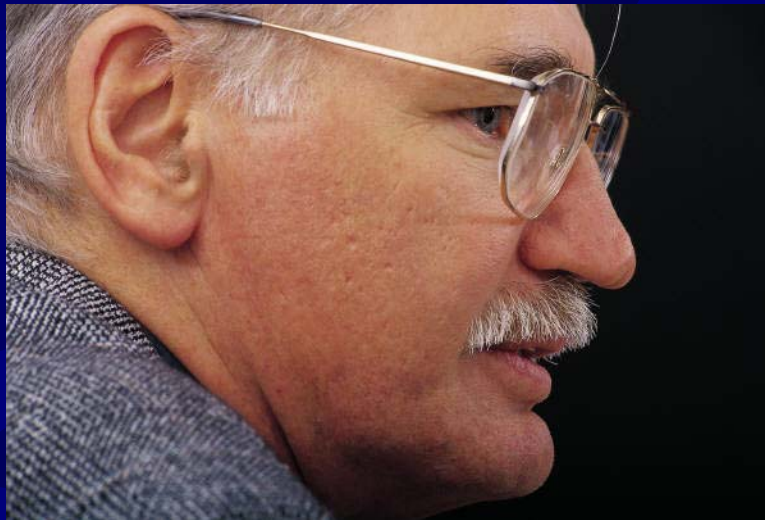
Biological Aspects of Injury

Further Psychological Problems

- ✱ Seizure disorder may include irritability and behavior dyscontrol
- ✱ Cognitive problems, especially memory, affect, emotional response
- ✱ Denial of deficits may affect capacity to receive help
- ✱ Previously effective medications may not work or may exacerbate injury-related problems
- ✱ Depression may prevent participation

The Basic Person Doesn't Change

- ✱ The injury alters specific aspects of the person's psychological, cognitive and emotional function
- ✱ Specific personality traits or style remain



TBI Affects All Aspects of Life

- ☀ Previously competent individuals may show symptoms of psychiatric disease
- ☀ Coping skills are stressed
- ☀ Behavioral controls are lost



TBI Affects All Aspects of Life

- ★ Social skills and roles are affected
- ★ Insight into TBI-related changes may be limited
- ★ Previously self-managed symptoms may become out of control
- ★ Relationships/support systems are stressed



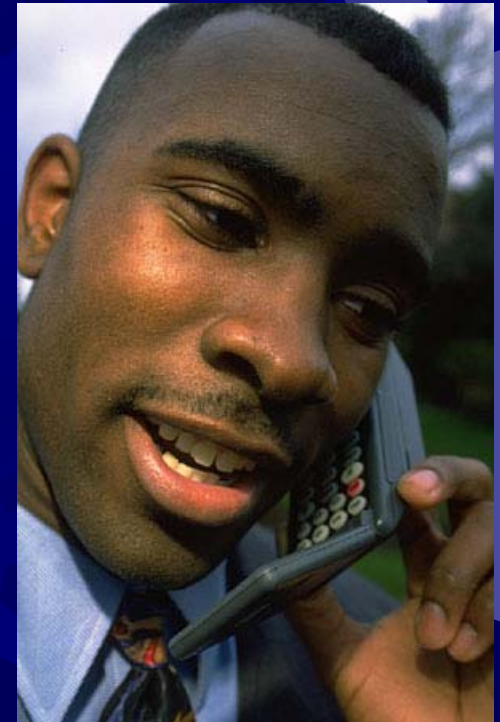
Positive Predictors of Recovery Outcome

- ✱ Focal vs. Globalized injury
- ✱ Aggressive early intervention and trauma care
- ✱ Work history



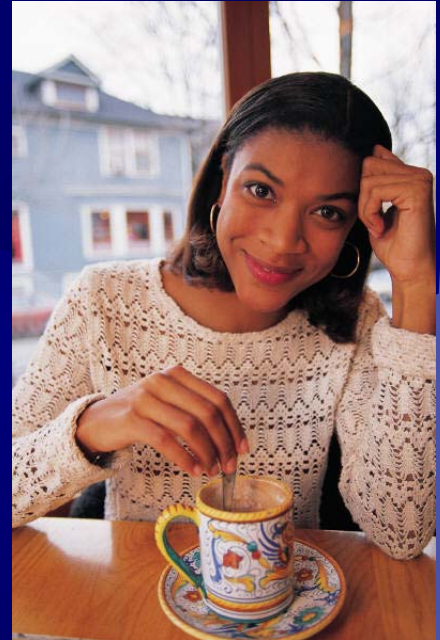
Positive Pre-Injury Predictors

- ★ Level of severity, coma duration
- ★ Natural recovery and return of functions
- ★ Medical/behavioral complications
- ★ Pre-injury achievement level
- ★ Learning, school and work history
- ★ Extroverted personality
- ★ Positive social history



Positive Pre-Injury Predictors

- ✦ Perseverance and motivation
- ✦ Strong social and family network and support
- ✦ Absence of pre-injury psychiatric symptoms
- ✦ Absence of substance abuse
- ✦ “Good character” and self control
- ✦ Strong-willed, determined personality



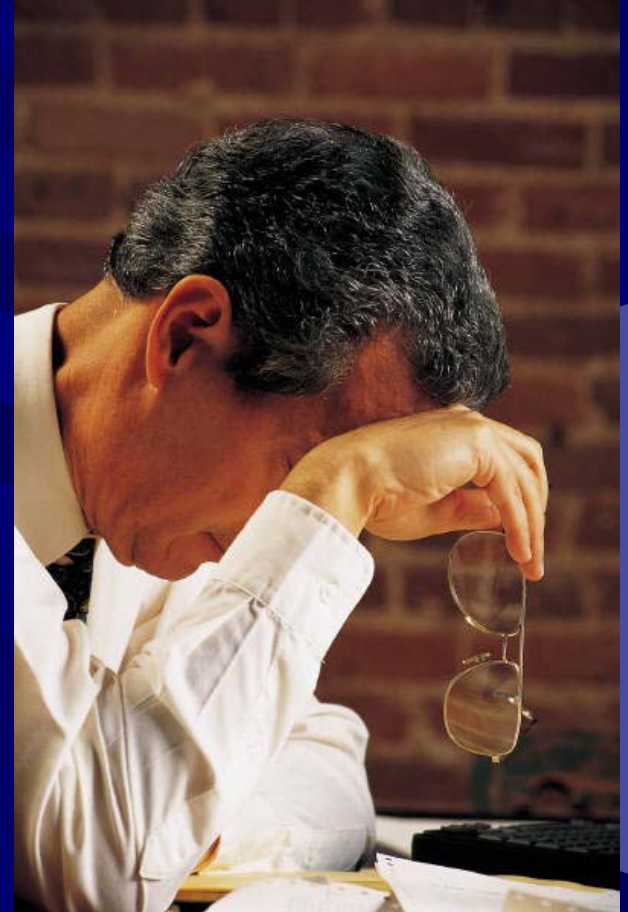
Negative Predictors

- ✱ Poor response to psychiatric medications
- ✱ Poor response to “talking” therapies
- ✱ Failure in behavioral programs requiring memory and problem-solving
- ✱ Social network failure: divorce, separation



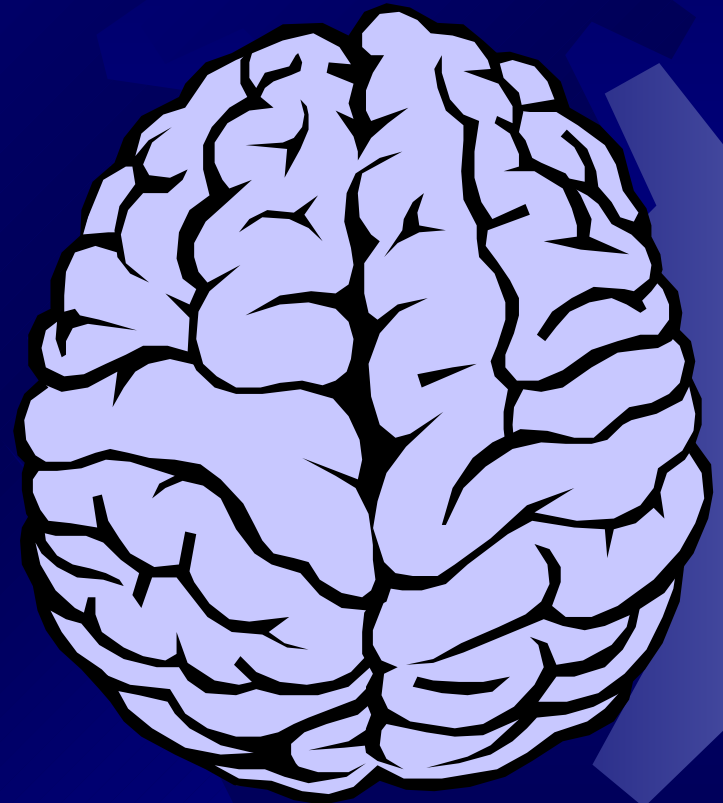
Negative Predictors

- ✱ Failure at work
- ✱ Involvement in the criminal justice system
- ✱ Persistence of chronic pain and headache symptoms
- ✱ Lack of support system



Lateralization Issues of Behavior Deficits

- ✱ Right Hemisphere: unable to respond, flat affect
- ✱ Left Hemisphere: depression, agitation, anxiety
- ✱ Diffuse: attention, concentration, arousal, response



TBI and Psychiatric Disease

Traumatic Brain Injury can mimic psychiatric symptoms

Examples: memory problems, behavioral and emotional control problems, mood disorders



Biological Brain Changes can Mimic Psychiatric Disease



- ✱ Biological changes can exacerbate a pre-existing psychiatric disease
- ✱ Executive Syndrome can resemble a thought disorder
- ✱ Behavioral features can resemble other conditions

TBI and Psychiatric Disease

TBI can mask psychiatric symptoms

Example: Frontal system damage can produce expressive aphasia/blunting, which may reduce the person's ability to express sadness

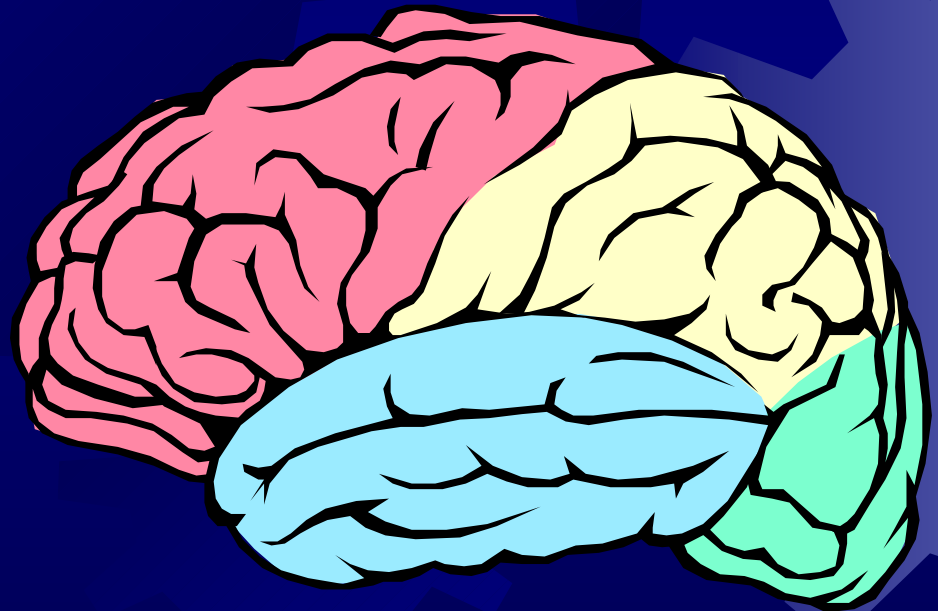


Risk Factors Associated with Psychiatric Diagnosis (Lishman, 1988)

- ✱ Organic factors
- ✱ Psychosocial factors (socio-economics, pre-morbid personality)
- ✱ Past history of psychiatric illness
- ✱ Family history of psychiatric illness
- ✱ Male
- ✱ Emergence of problems one year post-injury

Research Highlights

- ✱ Localization of injury (Fann, 1995)
- ✱ Noradrenergic and serotonergic projections are sites of contusion (Rosenthal, 1998)
- ✱ Individuals with depression and anxiety perceive themselves as more ill (Fann, 1995)



Research Highlights

- ✱ Reaction to failure (Alexander, 1975, 1992)
- ✱ Right hemisphere damage (Silver, 1992)
- ✱ Pre-morbid factors and social adjustment (Robinson & Jorge, 1993)
- ✱ Biochemical response (Robinson & Jorge, 1993)

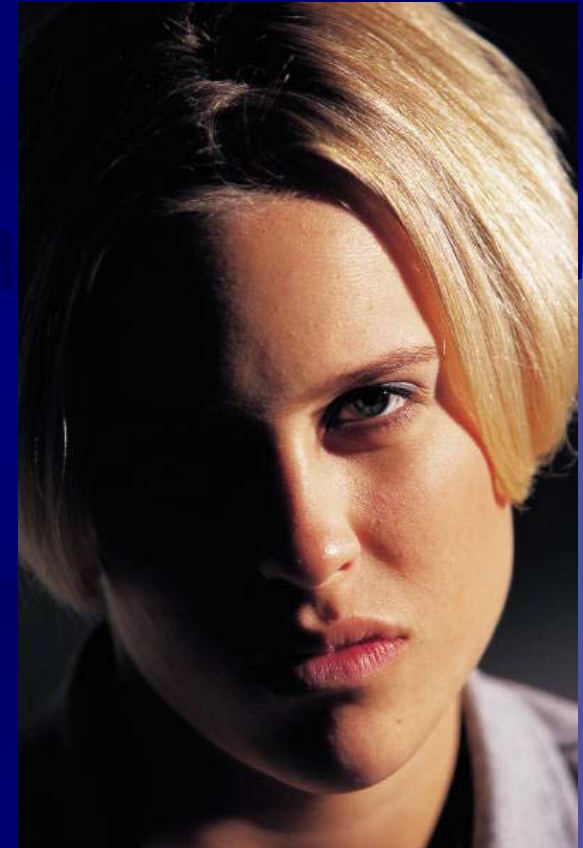
Brain Injured Patients with Psychiatric Disorders (Van Reekum, 2003)



The level of severity of the person's brain injury relates to the potential for the emergence of psychiatric disorders in the first 24 months post-injury

Personality Disturbances After Brain Injury

- ✦ Anxiety or “catastrophic reaction”
- ✦ Emotional lability/disinhibition
- ✦ Paranoia and psychomotor agitation
- ✦ Denial
- ✦ Depression
- ✦ Social withdrawal
- ✦ Amotivation/abulia



Distinguishing Brain Injury from Psychiatric Problems

- ★ Physical injury to the brain
- ★ Cognitive and behavioral deficits
- ★ Emotional and personality change
- ★ Attention, concentration, arousal, filtering
- ★ Memory problems
- ★ Seizure problems
- ★ Self regulation

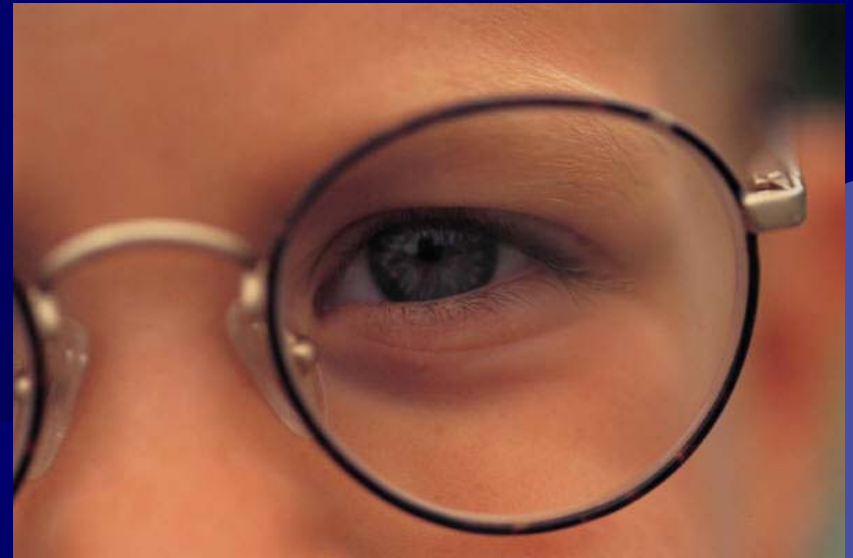


Psychological Syndromes can Co-occur or Predate Injury

- ★ When did the symptoms emerge, before or after the TBI?
- ★ What were persons like before injury?
- ★ What were their coping styles?
- ★ How have they adjusted to disability?
- ★ What new symptoms/behaviors have developed?

Problems in Diagnosing Psychiatric Illness in TBI

- ☀ Timing between injury and emergence of symptoms
- ☀ In mild cases lack of documentation of extent/severity of injury
- ☀ Pre-morbid personality traits
- ☀ Pre-injury issues



Rate of Psychiatric Illness One Year Post Brain Injury

- ☀ 21.7% of individuals with TBI had ICD-9 diagnosis vs 16.4% of general population (1998)
- ☀ Past studies focused on individuals with TBI who were seen in psychiatric hospitals



Psychiatric Diagnosis Distribution Following TBI



- ☀ Male - 21.6%
- ☀ Female – 11.3%
- ☀ Mild brain injury – 17.2%
- ☀ Moderate and severe brain injury – 23.3%

Psychiatric Diagnosis Features

Relationship of psychiatric diagnosis to:

- ✱ Younger age
- ✱ Glasgow outcome scale score
- ✱ History of pre-injury ETOH use/abuse
- ✱ History of psychiatric illness
- ✱ Lower Mini Mental State score
- ✱ Fewer years of education (Deb, 1999)
- ✱ Not working before injury (Bowen, 1998)

Psychiatric Issues in TBI Cases

- ✱ Male/female 70%/30% more likely to develop psychiatric symptoms
- ✱ Elevated risk for bi-polar affective disorder
- ✱ Seizures noted in 50% of cases with mania (Shukla, 1987)
- ✱ Limbic system lesions in 75% of manic cases (Starkstein, 1987)
- ✱ Family history of mood disorders

Diagnostic Issues in BI Group

★ Depressive episode	13.9% vs. 2.1%
★ Panic Disorder	9.0% vs. 0.8%
★ Generalized anxiety	2.5% vs. 3.1%
★ Phobic disorder	0.8% vs. 1.1%
★ Obsessive compulsive	1.6% vs. 1.2%
★ Schizophrenia	0.8% vs. 0.4%
★ ETOH dependence	4.9% vs. 4.7%

Brain Injury and Depression

Depression following brain injury occurs at a rate of 44.3% vs. 5.9% in non-brain injured population



Differential Diagnosis Issues

How can the clinician determine the role of injury and pre/post injury psychiatric factors that contribute to behavioral dysfunction?



Pre-existing Psychiatric Disorders Related to TBI

- ✱ Dementia due to head injury
- ✱ Cognitive disorder
- ✱ Bipolar disorder (manic or depressive types)
- ✱ Mood disorders (depression, mania)
- ✱ Sleep disorder
- ✱ Anxiety disorders
- ✱ Intermittent explosive disorder



Pre-existing Conditions can Affect Recovery from TBI

- ☀ Limited coping skills
- ☀ Impaired ability to manage symptoms
- ☀ Cognitive problems limit capacity to manage disability and pre-existing condition
- ☀ Advent of new behaviors
- ☀ Prior medications may increase cognitive problems

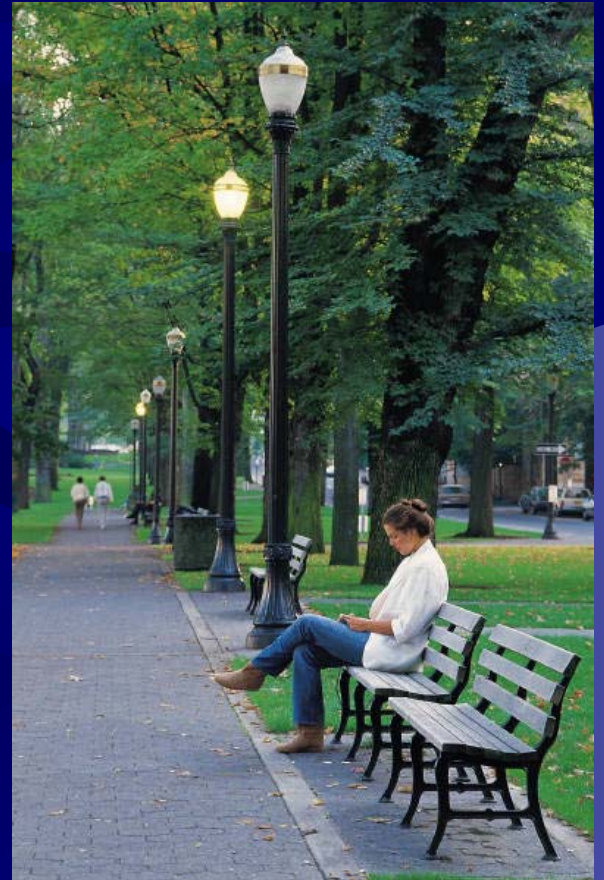


Effect of TBI on Underlying Psychiatric Disease

- ✱ Reduced capacity to self-manage symptoms
- ✱ Diminished impulse control leads to enhanced interpersonal problems
- ✱ Psychological defenses and coping skills fail to function
- ✱ Denial of deficits prevents person from responding to injury-related deficits

Effect of TBI on Underlying Psychiatric Disease

- ☀ Interpersonal relationships change
- ☀ Social role is altered
- ☀ Seizures and dyscontrol event are misinterpreted
- ☀ Enhanced dependent needs affect psychological status



Adjustment Difficulty due to Emotional & Behavioral Issues

- ✱ Emotional change
- ✱ Impaired perception of social interaction
- ✱ Impaired self control
- ✱ Increase dependency
- ✱ Behavioral rigidity



Most Frequent Problems Cited by Family Members

- ☀ Slowness
- ☀ Irritability
- ☀ Impatience
- ☀ Depression
- ☀ Memory



Co-Morbidity: PTSD & TBI

(Arnon, 1998)

- ★ 32% of motor vehicle accident victims meet diagnostic criteria for PTSD one year post-injury
- ★ Those with PTSD have higher rates of pre-morbid/co-morbid psychopathology (anxiety and affective disorders)
- ★ Immediacy of PTSD symptoms is a better predictor of later PTSD than injury severity

Role of Prior Learning or Attentional Problems in Occurrence of Psychiatric Diagnosis

- ✱ Prior learning and attentional problems are enhanced
- ✱ Diminished filtering and stimuli selection
- ✱ Altered coping skills produce dysfunctional responses



Psychiatric Issue or Brain Injury?

- ✱ Mania vs. Arousal problems
- ✱ Anxiety
- ✱ Denial
- ✱ Confusion
- ✱ Depression
- ✱ Cognitive problems
- ✱ Personality changes
- ✱ Intellectual changes
- ✱ Thought disorder vs. Thinking problem

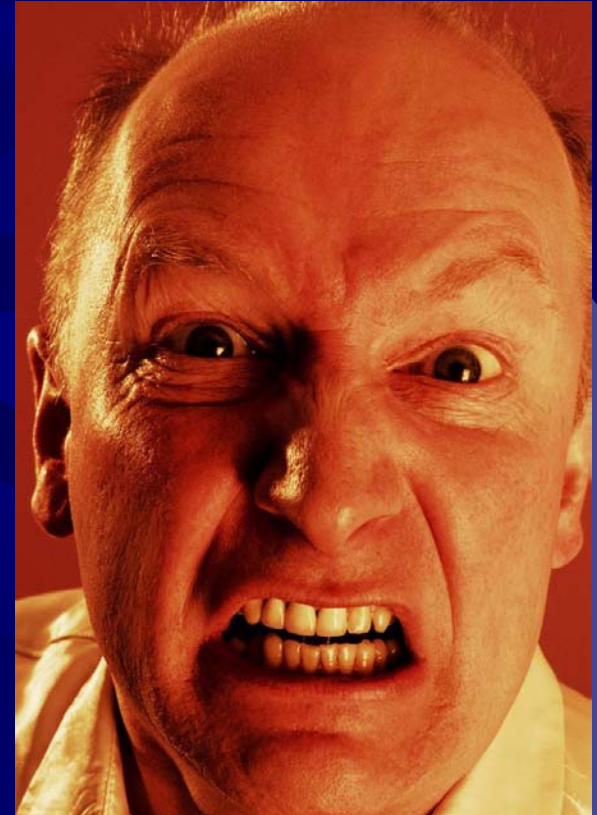


Psychiatric Features of TBI

- ✱ Mania - Agitation
- ✱ Anxiety - *Catastrophic Reaction* (Goldstein)
- ✱ Denial - Inability to accept deficits
- ✱ Confusion - Disorientation and memory problems
- ✱ Depression – Withdrawal, abulia

Neurologic and Neuropsychiatric Features

- ✱ Atypical seizure disorders
- ✱ Intermittent explosive disorder (Yudofsky)
- ✱ Neurologic rage or limbic-psychotic aggressive syndrome (Dorothy Lewis)

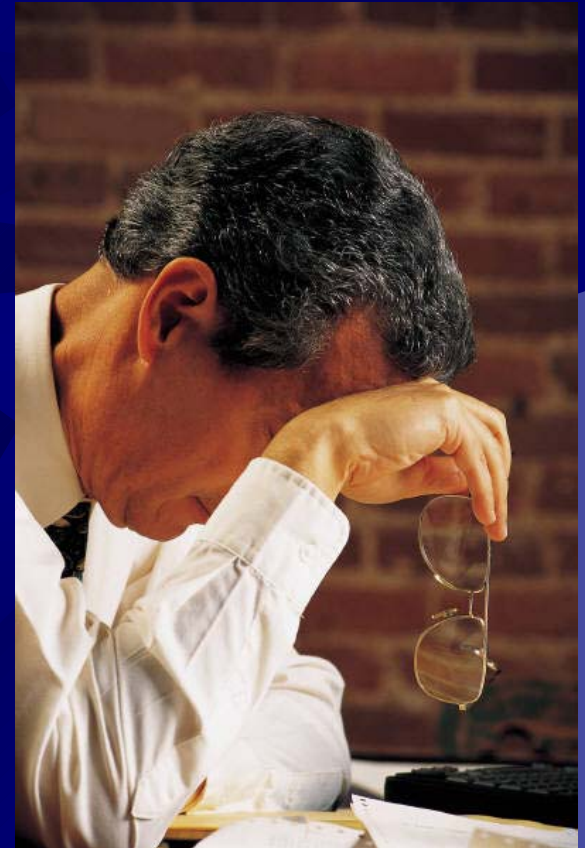


Neurologic Rage Identifiers

- ✱ Sudden loss of behavioral control, “out of the blue”
- ✱ Inability to stop the behavior
- ✱ Seizure-like quality, unawareness of the individual to the event
- ✱ Deficient memory of the event (Dorothy Lewis)

Factors Leading to Behavioral Problems in TBI

- ✱ Primary and secondary aspects of the physical injury
- ✱ Development of emotional problems
- ✱ Development of cognitive problems



Two Type of Behavioral Problems

- ☀ Behavioral excess –
too much
- ☀ Behavioral deficit –
too little

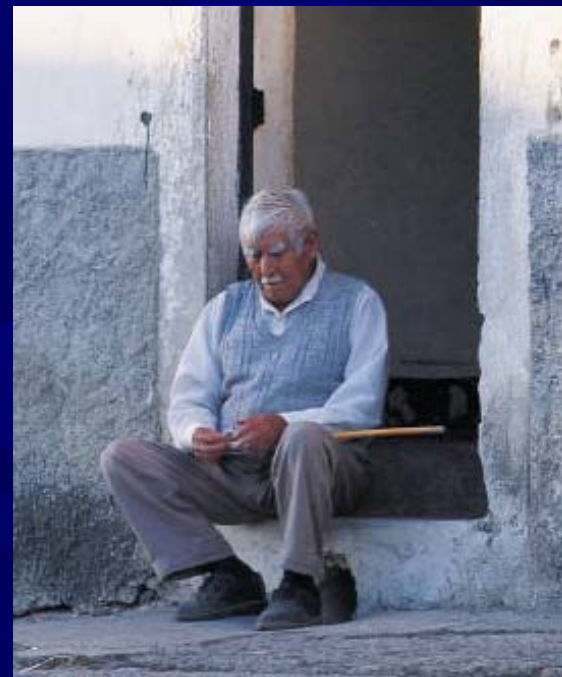


Neurobehavioral Issues

- ✱ Hyper/hypo arousal
- ✱ Level of response to external events/filtering
- ✱ Stimulus control vs. *stimulus bound*
- ✱ Denial
- ✱ Judgment
- ✱ Impulsivity vs. self-regulation
- ✱ Irritability and seizure-like events

Neurobehavioral Features

- ✱ Impulsivity (lack of self-regulation)
- ✱ Level of motor agitation/restlessness
- ✱ Aggressivity and assaultiveness
- ✱ Apathy, abulia, lack of motivation
- ✱ Irritability, impatience



Interpersonal/Psycho-Social Factors of Behavioral Problems



- ✱ Impaired self-perception
- ✱ Emotional changes
- ✱ Egocentric thinking
- ✱ Impaired perception of social issues
- ✱ Increased dependency
- ✱ Behavioral rigidity

Interpersonal/Psycho-Social Factors of Behavioral Problems

- ☀ Irritability
- ☀ Anger control problems
- ☀ Mood instability
- ☀ Hypo/hyper sexuality
- ☀ Diminished drive/motivation
- ☀ Cognitive deficits



Factors of Cognitive Problems in TBI

- ✱ Level of arousal
- ✱ Sensorium disruption
- ✱ Concentration and focus
- ✱ Filtering, stimuli control



Factors of Cognitive Problems

- ✱ Orientation and confusion
- ✱ Memory, information retrieval
- ✱ Problem-solving and decision-making
- ✱ Language and communication



Cognitive Problems Can Look Like Behavioral Problems

- ☀ Attention and filtering problems
- ☀ Over/under arousal
- ☀ Concentration
- ☀ Memory
- ☀ Task learning
- ☀ Novel learning (old to new)





The first step in making a diagnosis is to think of it.

-- Thibault, 1992

Evaluate and Separate Post-Injury from Pre-Injury Problems



Diagnostic Approaches

- ☀ Interview with individual
- ☀ Comprehensive medical and psychiatric history
- ☀ Developmental and school history
- ☀ Neurological evaluation
- ☀ Neuropsychological assessment
- ☀ Medical file review



Pre-Morbid Issues

- ☀ Presence of known psychiatric condition
- ☀ Level of adjustment, degree of attainment (school, work, family)
- ☀ History of learning, behavior and conduct problems
- ☀ History of substance problems
- ☀ Medical history
- ☀ School and vocational history



Post-Injury Effect on Coping Skills and Personality


- ☀ Response to disabling condition(s)
- ☀ Cognitive deficits
- ☀ Neurobehavioral deficits
- ☀ External support system
- ☀ Motivation/initiative
- ☀ Substance use/abuse
- ☀ Engagement in meaningful activities



Persistent Problems of Recovery and Rehabilitation

- ✱ Irritability
- ✱ Impulsivity
- ✱ Egocentricity
- ✱ Lability
- ✱ Judgment deficits
- ✱ Impatience
- ✱ Tension/Anxiety
- ✱ Depression





Implications for Rehabilitation: Why Patients “Fail”

Persistent Problems of Recovery and Rehabilitation

- ✱ Hypersexuality
- ✱ Hyposexuality
- ✱ Dependency
- ✱ Silliness/Euphoria
- ✱ Aggressivity
- ✱ Apathy
- ✱ Childishness
- ✱ Disinhibition



Why Patients “Fail”

Strategy:

- ☀ Individual and Group Psychotherapy

Why?

- ☀ Can't identify problems as shared by others
- ☀ Difficulty maintaining behavioral alternatives

Why Patients “Fail”

Strategy:

- ✱ Insight-Oriented Approaches

Why?

- ✱ Can't identify problem with self
- ✱ Problems with generalization

Why Patients “Fail”

Strategy:

- ☀ Didactic Approaches

Why?

- ☀ Memory problems prevent use of previous learning

Why Patients “Fail”

Strategy:

- ✱ Milieu Treatment

Why?

- ✱ Social deficits inhibit positive peer group membership

Why Patients “Fail”

Strategy:

- ☀ Cognitive-Behavioral Therapy

Why?

- ☀ Memory problems and difficulty with generalizations

Why Patients “Fail”

Strategy:

- ✱ Behavior Modification

Why?

- ✱ Problems with impulse control
- ✱ Memory problems prevent reinforcement strategy from being effective

Why Patients “Fail”

Strategy:

- ☀ Medication Management

Why?

- ☀ Some medications further cognitive problems or cause disinhibited behavior

Why Patients “Fail”

Strategy:


- ✱ Addictive Treatment/Self-Help Groups

Why?

- ✱ Cognitive problems prevent identification with the speaker/group process
- ✱ Individual cannot apply information to self

Why Patients “Fail”

- ✱ Person cannot process “talking therapies”
- ✱ Limited insight
- ✱ New behaviors (e.g. impulsivity) are related to the brain injury
- ✱ Increased dependence
- ✱ Unable to relate to previously effective support groups (e.g. AA, NA)



Support System Stresses Increase Psychological Issues

- ✱ High incidence of divorce or loss of primary relationship (50% in first two years post-injury)
- ✱ Adult children return to aging parents for physical assistance
- ✱ Loss of friends and work
- ✱ High potential for substance use/abuse
- ✱ Loss of social role with family, friends and community
- ✱ Cultural factors influence recovery

Social Network Issues Complicate Rehabilitation


- ✱ Social network failure seen 24-months post injury (Burke and Weslowski. 1989)
- ✱ Psychological effect of withdrawal or loss of supports





Social Network Issues Complicate Rehabilitation

- ✱ Changing social role post-injury affects self-image and self-worth
- ✱ Individual response to loss of functions and social changes
- ✱ Recidivism and emergence of psychiatric symptoms commonly seen 12-24 months post-injury



Increasing Success in Rehabilitation and Treatment: What Works!

What Works?

- ✱ Early identification of problems
- ✱ Highly structured, social learning environment
- ✱ Repetitive “teaching” of behavioral alternatives
- ✱ External controls managed by staff, gradually transferred to the individual
- ✱ Neurological approach to medication management
- ✱ Integrated rehab program, including psychiatric and substance abuse treatment

What Works?

- ✱ Emphasis on learning and relearning of social role
- ✱ Teaching “scripts” for social interaction
- ✱ Guided/supported attendance at AA/NA/self-help groups
- ✱ Use of “failures” within treatment to address denial and limited insight

What Works?

- ✱ Focus on social role re-entry and response of family, friends, co-workers, peers, and others to the person
- ✱ Staff understanding of TBI-related behavioral, cognitive, emotional and psychological issues
- ✱ Understanding of adjustment to disability
- ✱ Teaching individual about consequences of TBI
- ✱ Promoting return to work, avocational and recreational activities

What Works?

- ☀ Consistent response from staff throughout the environment
- ☀ Use of behavioral analysis to understand brain/behavior issues
- ☀ Avoidance of negative consequences for behavior problems
- ☀ Focus on discharge engineering to assure that the individual moves to a supportive placement with the solid transfer of information and management techniques



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