Role of the Psychologist in Rehabilitation:
Appreciating and Countering Multiple Contributors to Impairment & Disability

Michael F. Martelli, Ph.D
Concussion Care Centre of Virginia, and Tree of Life
10120 West Broad Street, Suites G - H
Glen Allen (Richmond), Virginia 23060
Email: MFMartelli@cccv-ltd.com
VillaMartelli Disability Resources Website
http://villamartelli.com

"You're incredibly right."
Recovery & Adjustment
Following Insult or Illness

- If the Structure Tests say they Can, They Might Not
- If the Structure Tests say they Can’t, They Might

---

**REHABILITATION**

*The Systematic Process of:*

- Removing Obstacles to Independence
- Accessing Opportunities for Stepwise Achievements (Of Desired Goals) in the areas of Love, Work and Play!
- Changing Destiny!
Catastrophic Reaction: Goldstein's term for the extreme depression he observed after left-hemisphere lesions.

- "We have characterized the conditions of brain-injured patients, when faced with solvable and unsolvable tasks, as states of ordered behavior and catastrophic reaction. The [latter] show all the characteristics of anxiety."
- Organism in struggle to cope with the challenges of environment and own body.
- Whole; Cannot be divided into "organs" or "mind" & "body"
- "Disease" = changed state with the environment.
- Healing comes not through "repair" but through adaptation to conditions causing the new state
Common Personality Disturbances Following TBI

(Prigatano, 1987)

- Anxiety & the Catastrophic Reaction
cf Chronic Compensatory Effort Syndrome (Hopewell, 2001)
- Denial of Deficits (Anasognosia / Anosodiaphoria)
- Paranoia and Psychomotor Agitation (cf Bateson)
- Depression, Social Withdrawal & Amotivational States (cf Seligman; Taub)

Other Neurobehavioral Influenced Psychoemotional Patterns & Factors

- Behavior Disorders
  - Irritability / Reduced Frustration Tolerance, Impulsivity, Reduced Insight, Social Inappropriateness, Reduced Motivation, Increased Emotionality
- Executive Disorders
  - Initiation, Planning, Problem Solving, Self Regulation

- Psychosocial Disorders
- Substance Abuse
- Physical Dysfunction
- Cognitive Dysfunction
- Psychoemotional Dysfunction
- Psychosocial Changes / Disruption
- Self / Identity Changes / Disruption
Evidence for Rehabilitation Suppression by Catastrophic Reaction: **CONSTRAINT INDUCED MVMT TX**

Converging Lines of Evidence: Nonuse of a Single Deafferented Limb is a Learned Conditioned Suppression of Movement

- Neurologic injury → Depressed motor or perceptual function
- Lasts 2-6 months; progressive regaining of movement follows
- Initial attempts to use limb fail
- Begins to function adequately with 3 limbs, reinforcing 3 limb use
- Continued attempts to use deafferented limb produces failure, pain, incoordination, falling → punishment and suppression
- Nonuse response tendency persists, preventing monkeys from learning that after several months, the limb is Potentially Usable
- Conclusion: Animals never learned they could eventually use the limb (Learned Nonuse)

Evidence for Rehabilitation Suppression by Catastrophic Reaction: **Constraint-Induced Movement Therapy (CIMT)**

- To date, CIMT (Taub, 1966-present) used effectively for:
  - Upper paralytic/parietic limb of Chronic, Subacute CVA, TBI, LE CVA, Focal hand dystonia, Phantom limb pain
- Use Dependent Cortical Reorganization
  - Numerous efficacy studies, 5+ TMS, EEG, MEG studies with humans, 2+ studies of monkeys indicate: Cortical reorganization associated with TX
- Several Converging Lines of Evidence:
  - Nonuse of a Single Deafferented Limb is a Learned Conditioned Suppression of Movement...efforts to use limb during initial post trauma period are unsuccessful (due to diaschisis, etc.), painful, anxiety and failure inducing and result in Learned Nonuse (cf. Learned Helplessness, Catastrophic Reaction) persisting when cerebral reorganization possible.
- Mechanism of Action
  - (1) Changing learning contingencies reinforces Use Learning, inhibits "Nonuse Learning Phenomenon" (cf. Henri Meige (1904): "functional motor amnesia")
  - (2) Sustained, repeated practice of functional arm movements induces expansion of contralateral cortical area controlling movement, and recruitment of new ipsilateral areas.
Recovery After Injury
...and Adaptation to Impairment

Injury

Premorbid Vulnerabilities
Comorbid Vulnerabilities
Contextual Factors

Exceptional
Expected
Atrocious

M.F. Martelli, Ph.D.: 1999

Empirical Predictors of Poor Adjustment Following Injury

- Previous Treatment Failures (esp. if surgical)
- Length/Duration of Complaints
- Vagueness or Inconsistency of Complaints
- Presence of Serious Psychopathology, and, to a lesser degree, a Personality Disorder
- Repressive and Somatization Defenses, including strong Hypochondriacal (e.g., MMPI scale 1) and Hysterical Traits (e.g., MMPI Scale 3)
- Dependency Traits
- Depression
- Emotional Immaturity/Inadequacy & Poor Coping Skills
Empirical Predictors of Poor Adjustment Following Injury

- Greater reinforcement for "Illness" vs "Wellness" behavior
- Absence of Significant Supportive Other(s)
- Anger or Resentment or Perceived Mistreatment
- Fear of Failure Or Rejection (e.g. damaged goods; fear of being fired after injury)
- Loss of Self-confidence and Self-efficacy associated with Residual Impairments
- External (health, pain) Locus of Control
- Fear of Pain (Kinesophobia, Cogniphobia) Re-injury / Exacerbation of Injury

Other Specific Impediments (cont)

- Discrepancies between Personality / Coping Style Behaviors and Injury Consequences
- Insufficient Residual Coping Resources / Skills
- Disuse Atrophy
- Fear of Loosing Disability Status, Benefits, Safety Net
- Perceptions of High Compensability for injury
- Preinjury Job (task, work environment) Dissatisfaction
- Collateral Injuries (especially if "silent")
- Inadequate and/or or Inaccurate Medical Information
- Mis- or Late diagnosis and Mis- or Late Treatment
- Dichotomous (organic vs. psychologic) Conceptualizations of injury and symptoms
Kinesiophobia*

- Defined as the unreasonable or irrational fear of pain and painful reinjury upon physical movement.
- Phobic responses to pain (or pain phobias), as unhealthy pain maintaining habits, are a major contributor to pain related disability, or Avoidance Conditioned Pain Related Disability (ACPRD).
- After R/O malingering, Combination TX:
  - Reeducation, countering maladaptive phobic responses and promoting adaptive attitudes and treatment participation/ cooperation

*cf Cogniphobia

Fishbain (2000) Metaanalysis on Waddell signs:

- Not correlated with psychological distress or secondary gain
- Do not discriminate organic from nonorganic problems
- May represent an organic phenomenon
- Associated with greater pain levels and poorer treatment outcomes

Other False Positives Indicators:
- Pain Relief by DISTRACTION, FBS, etc.!!!
Mensana Clinic Test Discrimination Success: "Organic" versus "Functional" Back Pain
($\chi^2 = 133; p<0.0001$)

<table>
<thead>
<tr>
<th>Physical Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 Objective 17 Mixed 21 Exaggerating 30</td>
</tr>
</tbody>
</table>

Test Scores - Categories

| 146/155 = 94% | 43/57 = 75% | 8/39 = 15% |
| 9/155 = 6% | 14/57 = 25% | 33/39 = 85% |

Extra-medical Factors and Rehabilitation Outcome

- Longitudinal study of PI MVA litigants (Evans, 1994)
- Strongest predictors of successful outcome were
  - Inclusion of psychological services in the Tx plan
  - Receipt of immediate intervention, with return to work (RTW) treatment focus
  - RTW at reduced status or modified duties
- $\geq$ 6 months: uncooperativeness and delayed bill paying of medical insurance carriers (vs. medical symptoms) was most frequently reported stressor.
- Insurance carrier bill payment very strongly predicted RTW
  - Prompt (\(\leq30\) days): 97% had returned to work.
  - Delayed (\(>90\) days): 4% had returned to work.
Extra-medical Factors (cont)

- Incidence & claim closure speed of Whiplash injury after change to no-fault in Saskatchewan, CA (Cassidy, et al, 2000)
- Claims dropped by 28%
- Time to claim settlement was cut by 54%.
- Intensity of neck pain, level of physical functioning, depressive symptoms, having attorney increased claim closure for both
- Their Conclusion: Compensation for pain and suffering increases frequency, duration of claims and delays recovery
- Note: No-fault system eliminated most court actions, income replacement and medical benefits were increased and medical care became universal, without barriers
- Pre-injury anxiety was associated with delayed claim closure only under the tort system
- More Valid Conclusion: removal of financial disincentives and medicolegal associated treatment barriers and anxiety provocation has a facilitative effect on post-injury recovery.

PSYCHOLOGIC ASSESSMENT

- Domain Specific Pain Coping Measures
  - Multidimensional Pain Inventory (MPI)
    - Section 1 assesses pain severity, interference, support, pain severity, life control and affective distress.
    - Section 2 assesses significant others' responses with punishing, solicitous, and distracting responses.
    - Section 3 assesses activity levels with household chores, outdoor work, activities away from home, social activities and general activities

PSYCHOLOGIC ASSESSMENT
PSYCHOLOGIC ASSESSMENT

Domain Specific Pain Coping Measures
- **Cogniphobia Scale** *(Sample Items)*
  - I'm afraid that I might make the cause of my head pain worse if I concentrate too much
  - My head pain is telling me that I have something dangerously wrong
  - My accident/injury has put my head & brain at risk for the rest of my life
  - Headaches always mean I have an injury or have done something to make it worse
  - I'm afraid that I might make my medical condition worse by concentrating too much or being too mentally active
  - Simply being careful not to concentrate too hard or too long is the safest thing I can do to prevent my pain from worsening
  - Pain lets me know when to stop concentrating so that I don't injure myself
  - It's really not safe for a person with a condition like mine to engage in too much thinking and concentrating
  - No one should ever concentrate on difficult mental tasks when s/he is in pain

PSYCHOLOGIC ASSESSMENT

- **Psychoemotional Measures**
  - **Zung Depression Inventory**
    - Measures Cognitive, Affective, Psychomotor and Neurovegetative Symptoms of Depression
  - **MMPI** *(Sample Derived Information):*
    - Pattern 1: Willingness to Emit Pain Behaviors
    - Pattern 2: Distress/Discomfort About Illness (“How comfortably sick?”)
    - Pattern 3: Poor General Coping Skills (Are other problems making pain behaviors reinforcing?)
    - Pattern 4: Depression Complicating Pain Symptoms (mostly in the elderly)
    - Pattern 5: Tension (and sympathetic arousal) contributing to Pain
    - Pattern 6: Predicting Treatment Outcome
ASSESSMENT OF PSYCHOLOGICAL MEDIATORS OF PAIN:
A STRESS & COPING MODEL

- INDIVIDUAL PATIENT VARIABLES
  - Comorbid Coping Vulnerabilities
    - PTSD
    - Reactive Depression, Anxiety, etc.
    - Associated Psychosocial Stresses
  - Premorbid Coping Vulnerabilities

FUNCTIONAL MEDICAL DISORDERS

- Practitioners in the "trenches," often see patients with:
  - Unclear medical presentations
  - Recalcitrance to treatment
  - Significant psychological disturbances
  - Uncertain intertwining of psychological and medical
  - Typically diagnosed "functional"
  - Often labeled "chronic" & beyond help
- Better Understanding Needed for More Effective Rehabilitation
  - Factitious
  - Somatoform
  - Psych Factors Affecting A GenMed Condition
  - Functional Amnesia
  - Psychogenic Seizures, etc.
### Vulnerable Personality Styles

<table>
<thead>
<tr>
<th>Style</th>
<th>Premorbid traits</th>
<th>Post morbidity reactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overachiver</td>
<td>Sense of self derived from driven accomplishments, which is frequently accompanied by obsessive compulsive traits</td>
<td>Catastrophic reaction if drop in performance is perceived</td>
</tr>
<tr>
<td>Dependent</td>
<td>Excessive need to be taken care of, frequently leading to submissive behaviors and a fear of separation</td>
<td>Paralyzed by symptoms if critical erosion of independence occurs</td>
</tr>
<tr>
<td>Borderline personality traits</td>
<td>Pattern of instability in interpersonal relationships and self-image with fear of rejection or abandonment</td>
<td>Exacerbation of personality disorganization, including despair, panic, impulsivity, instability, and self-destructive acts</td>
</tr>
<tr>
<td>General Insecurity</td>
<td>Weak sense of self, which can include shame, guilt, and dependency needs</td>
<td>Magnification of symptoms</td>
</tr>
<tr>
<td>Grandiosity</td>
<td>Overestimation of abilities and inflating accomplishments; can include need for admiration and lack of empathy</td>
<td>Minimization or denial of symptoms. If failure results, crash of self-esteem can result in catastrophic reaction</td>
</tr>
</tbody>
</table>


### Vulnerable Personality Styles (Cont.)

<table>
<thead>
<tr>
<th>Style</th>
<th>Premorbid traits</th>
<th>Post morbidity reactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antisocial traits</td>
<td>Tendency to be manipulative or deceitful, temperamental, impulsive and irresponsible; lacks sensitivity to others</td>
<td>Possible exaggeration or malingering, increased risk taking, irritability, takes little responsibility for recovery</td>
</tr>
<tr>
<td>Hyperactivity</td>
<td>Restless, unfocused and sometimes disorganized</td>
<td>Attentional difficulties and impulsivity may be compounded; possible oppositional behavior</td>
</tr>
<tr>
<td>Depressed</td>
<td>Mood fluctuations dominated by negative affect</td>
<td>Increase of depressive symptoms, despondency</td>
</tr>
<tr>
<td>Histrionic style</td>
<td>Emotionality and attention seeking behavior</td>
<td>Dramatic flavor to symptom presentation; blaming behavior</td>
</tr>
<tr>
<td>Somatically focused</td>
<td>Preoccupation with physical well being, reluctance to accept psychological conflicts.</td>
<td>Endorsement of multiple premorbid physical symptoms intermixed with new or changing post morbidity residua</td>
</tr>
<tr>
<td>Post traumatic stress disorder</td>
<td>Prior stressors produced an emotional reaction of fear and helplessness</td>
<td>Decreased coping ability, cumulative effect of traumas with exaggerated reaction to current crisis</td>
</tr>
</tbody>
</table>

### The Vulnerability To Disability Rating Scale

**General Version**

<table>
<thead>
<tr>
<th>Increased Complaint Duration</th>
<th>Complaint Inconsistency / Vagueness</th>
<th>Previous Treatment Failure</th>
<th>Collateral Injury / Impairment</th>
<th>Pro/conversed Medical History</th>
<th>Medication Reliance</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = &lt; 6 Months</td>
<td>0 = Little</td>
<td>0 = Insignificant</td>
<td>0 = Insignificant</td>
<td>0 = Insignificant</td>
<td>1 = Moderate</td>
</tr>
<tr>
<td>1 = &lt; 12 Months</td>
<td>1 = Mixed</td>
<td>1 = Mild/Moderate</td>
<td>1 = Mild to &lt; Moderate</td>
<td>1 = Moderate</td>
<td>1 = Moderate</td>
</tr>
<tr>
<td>2 = &gt; 12 Months</td>
<td>2 = Mostly Inconsistent</td>
<td>2 = Mostly or All Failures</td>
<td>2 = Significant</td>
<td>2 = Significant</td>
<td>2 = Significant</td>
</tr>
</tbody>
</table>

### Vulnerability to Disability

- **Severity of Current Psychosocial Stress**
  - Psychosocial Coping Liabilities
  - Victimization Perception
  - Social Vulnerability
  - Human Reinforcement

### Vulnerability Score

- **Non-significant**
- **Little**
- **Moderate**
- **Significant**

### Martelli, 1996

- **Neurosensitization Syndrome (NSS)**: Syndrome of Subjective Discomfort and Objective Functional Disability
- **Often appears Excessive in Duration and Severity** (vs. initiating event)
- **May be Resistant to Conventional Medical and Psychological interventions**
- **Hypothesized to Develop from Progressively Enhanced Sensitivity / Reactivity of CNS mechanisms**

---

**More Evidence for Biopsychosocial Effects of Catastrophic Reaction: Traumatic Disability & NEUROSENSITIZATION Syndromes**

(e.g., Miller, 1997; 1998; 1999; 2000)

- **Neurosensitization Syndrome (NSS)**
  - Syndrome of Subjective Discomfort and Objective Functional Disability
  - Often appears Excessive in Duration and Severity (vs. initiating event)
  - May be Resistant to Conventional Medical and Psychological interventions
  - Hypothesized to Develop from Progressively Enhanced Sensitivity / Reactivity of CNS mechanisms

---

**Neurosensitization Syndrome (NSS)**

- Syndrome of Subjective Discomfort and Objective Functional Disability
- Often appears Excessive in Duration and Severity (vs. initiating event)
- May be Resistant to Conventional Medical and Psychological interventions
- Hypothesized to Develop from Progressively Enhanced Sensitivity / Reactivity of CNS mechanisms

---

**Martelli, 1996**

- Neurosensitization Syndrome (NSS): Syndrome of Subjective Discomfort and Objective Functional Disability
- Often appears Excessive in Duration and Severity (vs. initiating event)
- May be Resistant to Conventional Medical and Psychological interventions
- Hypothesized to Develop from Progressively Enhanced Sensitivity / Reactivity of CNS mechanisms

---

**More Evidence for Biopsychosocial Effects of Catastrophic Reaction: Traumatic Disability & NEUROSENSITIZATION Syndromes**

(e.g., Miller, 1997; 1998; 1999; 2000)

- **Neurosensitization Syndrome (NSS)**
  - Syndrome of Subjective Discomfort and Objective Functional Disability
  - Often appears Excessive in Duration and Severity (vs. initiating event)
  - May be Resistant to Conventional Medical and Psychological interventions
  - Hypothesized to Develop from Progressively Enhanced Sensitivity / Reactivity of CNS mechanisms

---

**Martelli, 1996**

- Neurosensitization Syndrome (NSS): Syndrome of Subjective Discomfort and Objective Functional Disability
- Often appears Excessive in Duration and Severity (vs. initiating event)
- May be Resistant to Conventional Medical and Psychological interventions
- Hypothesized to Develop from Progressively Enhanced Sensitivity / Reactivity of CNS mechanisms

---

**More Evidence for Biopsychosocial Effects of Catastrophic Reaction: Traumatic Disability & NEUROSENSITIZATION Syndromes**

(e.g., Miller, 1997; 1998; 1999; 2000)

- **Neurosensitization Syndrome (NSS)**
  - Syndrome of Subjective Discomfort and Objective Functional Disability
  - Often appears Excessive in Duration and Severity (vs. initiating event)
  - May be Resistant to Conventional Medical and Psychological interventions
  - Hypothesized to Develop from Progressively Enhanced Sensitivity / Reactivity of CNS mechanisms
Frequently Comorbid and Treatment Refractory Syndromes

- Persistent Post Concussion Syndrome
- Post Traumatic Stress Disorder
- Chronic Pain
- Depression
- Trait Anxiety Disorders
- Vestibular Disorders
- Neurogenic Fatigue
- Hyperacusis, Tinnitus
- Fibromyalgia
- Chronic Fatigue
- Multiple Chemical Sensitivity

Effect of Repeated Stimulation on CNS

- Kindling vs. Habituation
  - **Habituation**: continuous or short interval stimulation effect
  - **Kindling**: extended interval subthreshold stimulation summating as seizure, with permanent changes in CNS excitability resulting in susceptibility to intermittent stress, and spontaneity (amygdala)
Psychological reaction to Extremely Distressing Event

- Experience intense fear, terror, and helplessness *(Loss of Control)*
- Recurrent and Intrusive Recollections of event
- Distressing Dreams Re-experiencing event
- Deliberate Avoidance: associated thoughts, feelings, activities or situations
- MTBI like symptoms: Concentration difficulties, Forgetfulness, Sleep difficulties, Irritability, and Poor frustration tolerance, frequent Depression, Anxiety
- Cognitive Problems secondary to emotional and psychological distress (ACC, HPA activation)

Post-traumatic Stress Disorder
Psychotropic and Pain Medications are often First Stop Gap Measures
Psychotherapy is the Treatment of Choice for most cases of Traumatic Disability Syndromes
Dubovsky (1997): psychotherapy relationship "splints" the neurophysiological regulatory mechanisms, providing a repeated corrective stabilization that eventually allows normal functioning
Martelli (2000): "Calming the Catastrophic Reaction" through Integrated Combination Treatments
- Cf EMDR, Accupuncture, Biofeedback, Grad Exposure, Teasell Physical Rehab Beta-blockers, AEDs, Amytal, Tizanidine, etc.

NEUROSENSITIZATION Syndromes: Treatment Implications
(Miller, 1997; 1998; 1999; 2000)

Resolving the Persistent Catastrophic Reaction

- Confront Fears/ Deficits:
  - Without being Overwhelmed by distress
  - With a Conceptual Framework and Rehab Methodology that Bolsters and Supports and offers Hope Conceptually and Through Graduated Successes
  - With a Calmer CNS and Decreasing Catastrophic Reactions (emotional, cognitive, neurophysiologic) that would block optimal recovery
  - Cf EMDR, Accupuncture, Biofeedback, Grad Exposure, Teasell Physical Rehab Beta-blockers, AEDs, Amytal, Tizanidine, etc.
Holistic Habit Rehabilitation
Ingredients: The 3 P’s

• Plan: A strategy or design for stepwise progress toward a desired outcome. Most plans are based on task analyses, or breaking seemingly complex tasks down into simple component steps, and proceeding in a listwise fashion. Clearly, the more specific, concrete, and obvious, the more likely the plan will work.

• Practice: Repetition is the cement for learning which makes complex and cumbersome and boring tasks more automatic and effortless. With practice and repetition, even complex tasks become automatic and habitual. That is, a habit, or automatic robots, performs the tasks for us without special effort, energy, concentration, memory, and so on.

• Promoting Attitude: A facilitative attitude provides the motivation that fuels persistence & mobilization of energy necessary for accomplishment of a progressive series of desirable but challenging goals.

M.F. Martelli, Ph.D.
1999

Task Analysis:
The Building Block of LEARNing

• TA: breaking a task into single, logically sequenced steps & recording in a Checklist and then checking off each step as it is completed.
• TA’s always make task initiation, completion & follow through much easier...greatly improve performance despite limitations in memory, attention, energy, initiative, ability to sustain performance, organization...any other difficulty.
• TA’s reduce demand and energy consumed by reasoning and problem solving associated with planning, organizing & having to recall, make decisions & prioritize appropriate steps and sequences for both basic & complex tasks.
• TA’s (re)establish efficient habit routines: that make up normal everyday activity. 30 to 1000 consistent repetitions produce automatic habits
• Ingredients for (re)building automatic habits are the 3 P’s: Plan, Practice, Promoting Attitude. The result is (re)habilitation, or increased efficiency accomplished by removing obstacles to independence.
The Five Commandments of Rehabilitation: Incorporating Cognitive Behavioral Psychotherapy to Conquer the Catastrophic Reaction

Thou Shall Learn New Ways to Do Old Things.

Thou Shall Make Only Accurate Comparisons. Thou shall not make false comparisons.

Thou Shall Not Beat Thyself Up...Instead, Thou Shall Build Thyself Up!

Thou Shall View Progress as a Series of Small Steps

Thou Shall Expect Challenge & Strive to Beat It

Shaping via Reinforcement of Successive Approximations of Desired Behavior:

- This involves successively rewarding the smallest movements (baby steps) in the desired direction with carrots (i.e., verbal rewards, expressions of approval & appreciation, smiles & nonverbal gestures of approval, physical/tangible rewards, jumping up with joy, etc.)
- Each successful small step is rewarded, which teaches graduated successes.
Psychologically Based Pain Management

- Relaxation training
- Biofeedback
- Visualization/hypnosis
- Attention focus/distraction
- Graduated Exposure/Activity Programming
- Contingency Management
- Cognitive Behavioral Psychotherapy
- Treatment of comorbid depression, etc.
- Multidisciplinary and Interdisciplinary Treatment
- COMBINATION TREATMENTS

Desensitization Procedure Options

Desensitizing Medications

- Central Nervous System (CNS) Medications: Anti-epileptic drugs, Tizanidine HCL, Amytal, etc.
- Peripheral Nervous System (PNS) Medications: muscle relaxants; homeopathics?

Desensitizing CNS Neurophysiologic Procedures: EEG Biofeedback or EEG Driven Stimulation and adjunctive procedures such as sound and light (AudioVisualStimulation) and CranioElectrotherapy Stimulation, Transcranial Magnetic Stimulation, Brain Electrical Stimulation

Desensitizing PNS Procedures: EMG, Temp. Biofeedback; Various Relaxation Procedures; TENS
Desensitization Procedure Options (cont)

Desensitizing Behavioral Activity Procedures:
- Graduated Exposure / graduated activity programs; various exposure desensitization interventions, systematic desensitization, etc.; Pacing

Desensitizing Psychotherapeutic Procedures:
- Emotional desensitization of catastrophic reaction to injury and pain and other fears and trauma; splinting of emotional reactions; calming the catastrophic reaction; emotional reaction systematic desensitization; sensory desensitization / reprocessing psychotherapy

Powerful Psychotherapy Interventions

- Relaxation Proc's, Biofeedback, Hypnosis, etc.
- Cognitive Behavioral Psychotherapy
- Desensitization Procedures
- Shaping
- Behavioral Programming
- Schwartz (1996) 4-Step OCD TX Method
- Holistic Habit Retraining & Practical Adaptations
- Combination Interventions
- Network Therapy
- Group / Family Therapy
Effective Behavioral Medicine Group Studies

*Shapiro, Teasell (in press). Brit J Psychiatry
Design: 39 Conversion / Factitious motor disorder patients
- Standard Behavioural Rehabilitation program
  - 8 of 9 acute, 1 of 28 chronic pts improvey
- Strategic-behav TX for Nonimprovers
  - Frame: Full recovery = Organicity; Nonrecovery = Psychiatric
  - 13/21 chronic pts symptom-free at d/c

Conclusions: Strategic intervention superior with chronic pts. Other Tx components (wellness reinforcement, skills training) may be unnecessary.

Design: RCT of 187 hypochondriacal pts & volunteers
Intervention: 6-session, individual CBT vs usual medical care
Results at 12mo f/u:
- Less Hypochondriacal symptoms, beliefs, attitudes, health anxiety
- Less Impairment of social role functioning and ADL's
- No change in Hypochondriacal somatic symptoms

Conclusion: Brief, individual CBT designed to alter hypochondriacal thinking and restructure beliefs, produces beneficial long-term effects.
Biofeedback

- Visual and/or auditory information about bodily functions
  - Muscle tension
  - Skin temperature
  - Heart rate
  - Blood pressure
  - Breathing
  - Sweat gland activity
  - EEG (Brain waves)

Commonly treated conditions:

- Hypertension
  - Feedback on blood pressure, heart rate, and skin temperature (fingers, toes)
- Headaches
  - Feedback on muscle tension in the face and neck muscles
- Other chronic pain conditions, esp back, shoulders

PHYSIOLOGIC STRESS RESPONSE

**EVENT**

Perception

- Intervention Possibility

- RX: Relaxation
- RX: Modify Event or Environment
- RX: Reinterpret Problem Solve
- RX: Desynchronization

- Muscle Tone
- Heart Rate
- Blood Pressure
- Peripheral Vasconstriction
- Glucose Secretion
- EEG
- GI Secretions
- Breathing

Autonomic Nervous System

Medical & Rehabilitation Neuropsychology Service
Concussion Care Centre of Virginia
PATTERNING: Physiologic Response Habits

- Type I (Good) versus Type II (Bad) Stress
- Type I versus Type II Stress Response Habit

Chronic Stress and Disease Models
Pathophysiologic Resetting
PAIN PERPETUATION CYCLES: Resetting Physiological Function

PAIN

STRESS
& Sleep Disorder, Etc.

MUSCLE TENSION
& Muscle Fatigue

PAIN PERPETUATION CYCLES: Resetting Physiological Function

PAIN

STRESS
and/or Poor Posture
& Sleep Disorder, Etc.

MUSCLE TENSION,
& Muscle Fatigue
PAIN PERPETUATION CYCLES:
Resetting Physiological Function

PAIN
Physical Activity Avoidance
Disuse Atrophy

PAIN PERPETUATION CYCLES:
Resetting Physiological Function

HA PAIN
Cognitive Activity Avoidance
Disuse Atrophy
PAIN PERPETUATION CYCLES:
Over-Under-Activity Disability Pattern

Time I: Overactivity
Time II: Underactivity
Time I: Re-injury
Time II: Disuse Atrophy

RX:

The Basics: The 3 R's of Self Control

RESTING Baseline refers to the usual state of physiological & emotional arousal - for example, level of muscle tension, heart rate, electrical activity in the brain, or more general level of stress or emotional distress. Decreasing resting baseline level of physiological or emotional arousal provides increased protection against the harmful effects of stress by establishing a healthier regular resting state and a buffer against future stressors.

REACTIVITY to stressful events refers to the strength of increases in physiological variables such as heart rate, muscle tension or blood pressure, or the level of increased emotional arousal in response to stressful events. Decreasing our reactivity to stresses in the environment by controlling elevations in individual physiological channels & emotional status is another way of reducing the harmful effects of stress on our bodies and emotions.

RECOVERY refers to the length of time required for reducing physiological and emotional reactions to normal levels after stress responses. Learning to more quickly reduce our physiological and emotional responses reduces the harmful effects that come from prolonged stressful reactions and helps produce greater rebound & restoration of general physiological and emotional health. More importantly, it facilitates a habit of healthy recovery after stress that will lower long term physical and emotional distress and promote improved health and resistance to continuing stressors encountered in everyday life.
Table 1
The New RS Approach to Common Frontal Psychological Syndromes

<table>
<thead>
<tr>
<th>Syndrome</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Common Frontal Psychological Syndromes</td>
</tr>
<tr>
<td>2.</td>
<td>Common Frontal Psychological Syndromes</td>
</tr>
</tbody>
</table>

Downloadable References
That's all Folks!!

APPENDIX
Acquisition of Coping: Resilience (Optimal Learning)

Poor Acquisition of Coping: (Suboptimal Learning: Traumatization)
Graduated Exposure Programs in Rehabilitation

- Exposure to distressful emotional, physiological and sensory reaction situations
- Incremental increases in tolerance (and incremental compensatory learning, anxiety extinction, sensory interpretation distress) without experiencing significant anxiety or sensory distress.
- Requires person not experience distressful reactions or experiences.
- Examples: anxieties, phobias & distressful emotions and sensory reactions related to the following:
  - Noise and/or light (when not mediated by headaches, etc.)
  - Crowds and public places (e.g., stores, malls, sporting events)
  - Overwhelming visual stimulation and patterns
  - Driving (especially in traffic)

METHOD: Schedule Gradually Increased Exposure / Assigned Activities, Incremented in Time and/or Distance and/or Intensity that are followed Exactly
### Lisa's Graduated Exposure Driving Program

(Beginner's Version)

<table>
<thead>
<tr>
<th>Level/Step</th>
<th>Activity</th>
<th>Time</th>
<th>Frequency</th>
<th>SUDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1</td>
<td>Sit in and Start Car</td>
<td>&lt;= 2 min.</td>
<td>1-3 X/day</td>
<td></td>
</tr>
<tr>
<td>1-2</td>
<td>Start Car. Back up slightly, then pull forward in driveway, going no further than is comfortable</td>
<td>&lt;= 2 min.</td>
<td>1-3 X/day</td>
<td></td>
</tr>
<tr>
<td>1-3</td>
<td>Start Car, Back up all the way to street, then pull forward, going no further than is comfortable, and repeat one or two times.</td>
<td>&lt;= 2 min.</td>
<td>1-3 X/day</td>
<td></td>
</tr>
<tr>
<td>2-1</td>
<td>Start Car, Back up all the way to street and then slightly into street, then pull forward, going no further than is comfortable, and repeat one or two times.</td>
<td>&lt;= 2 min.</td>
<td>1-3 X/day</td>
<td></td>
</tr>
<tr>
<td>2-2</td>
<td>Start Car, Back up all the way to and one full car length into the street and then pull forward, going no further than is comfortable, and repeat one or two times.</td>
<td>&lt;= 2 min.</td>
<td>1-3 X/day</td>
<td></td>
</tr>
</tbody>
</table>

**RULES:**

- Stop the activity if you begin to feel even a little shaky.
- Do not progress to next level previous level completed for all exposures for 2 consec. days.
- Email feedback to MFM re: progress, any shakiness you experienced, when level completed.

---

### Graduated Exposure Sensory Tolerance Program

<table>
<thead>
<tr>
<th>Level/Step</th>
<th>Activity</th>
<th>Time</th>
<th>Frequency</th>
<th>SUDS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1</td>
<td>Stand on stepladder or chair for 3 Sec's (s)</td>
<td>3 Sec.</td>
<td>3 X/day</td>
<td></td>
</tr>
<tr>
<td>1-2</td>
<td>Perform a visuomotor scanning computer exercise</td>
<td>30 Sec</td>
<td>4 X/day</td>
<td></td>
</tr>
<tr>
<td>2-1</td>
<td>Listen to radio while driving</td>
<td>1 Min</td>
<td>1-3 X/day</td>
<td></td>
</tr>
<tr>
<td>2-2</td>
<td>Track 2 persons talking at same time</td>
<td>2 Min.</td>
<td>1-3 X/day</td>
<td></td>
</tr>
<tr>
<td>3-3</td>
<td>Visit Clover Mall (9-11am, 2-4pm, Main ent.)</td>
<td>10 min</td>
<td>1-2 X/day</td>
<td></td>
</tr>
</tbody>
</table>

**Sample Rationale:** “Like Breaking a Bronco, you can’t learn to ride until you can get in the saddle. You can’t get in the saddle until the horse believes it won’t die if something gets on its back. Similarly, You can’t increase your tolerance for (sounds, etc.) unless your system learns that it can tolerate some level of that (noise, etc.) without great (distress, pain, fatigue, etc.).”

M.F. Martelli, Ph.D.: 1999