THE PSYCHOLOGY OF CHRONIC PAIN IN PERSONS WITH TRAUMATIC & NON-TRAUMATIC BRAIN INJURY

By

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My Background

- M.S. Clinical Psychopharmacology
- M.S. Psychometrics
- Psy.D. Clinical Psychology with Emphasis in Neuropsychology
- Licensed Psychologist – Missouri, Louisiana, and Arkansas
- Board Certified Clinical Health Psychology (ABPP)
- Fellow of the American Academy of Clinical Health Psychology (FACHP)
- Registrant – National Register of Health Service Psychologists (NRHSPP)
- Missouri Psychological Association – Integrated Care and Pharmacology Committees
- Previous Board Member – Missouri Brain Injury Association
- Research – MMPI-2RF and new MMPI-3/Chronic Pain and Spinal Cord Stimulators/Spine Surgery Outcomes

2

Some of the Conditions I Assess and Treat

Depression **Anxiety** **ADHD** **Brain Injury (degree of impairment; Impulsivity/Speech and memory retraining) – neurofeedback** **Tinnitus** **Behavioral Medication Tapers (with medical management in place)** **Presurgical Evaluations/Prognosis for Surgery**	**Chronic Pain** **Fibromyalgia** **Migraine/Tension HA** **Neuropathy (various kinds)** **CRPS/RSD** **Trigeminal Neuralgia** **IBS** **Risk Assessment (Violence and Psychosexual Risk)** **Medication Risk/Medication Compliance**

Relevant Disclosures

- None

4

Outline

- PART I – Understanding Chronic Pain
  - Types of Pain and Development of the Pain Syndrome
  - Relationship between Chronic Pain and Traumatic Brain Injury
  - Psychological Factors impacting Pain and Brain Injury
    - Depression
    - Anxiety
    - Anger

5

Outline

- Part II – Psychological Evaluation of Chronic Pain
  - Kinesiophobia
  - Injustice
  - Catastrophizing
  - Anxiety
  - Depression
  - Somatization and Conversion
  - Psychopathology
  - (Measurements/Instruments)
  - Drug Effects and the Brain
  - Case Studies

6

Outline

- Part III – Interventions
  - Medical/Surgical
  - Pharmacological
  - Behavioral
  - Nutritional
  - Other

7

Outline

- Part IV – Dealing with Change and Adjustment Related to Pain and TBI
  - Coping with Change
  - Stages of Change
  - Resistance
  - Resilience
  - Acceptance
  - Conflict

8

I - Understanding Chronic Pain

9

Basic Types of [Physical] Pain

- Acute vs. Chronic Pain
- Cutaneous = skin-based, [usually] short in duration
- Somatic = ligaments, tendons, bones, (muscular) – not "nerve" like neuropathic – localized
- Visceral = internal (organs), more severe and dull in ache than other types of pain, can be difficult to localize
- Neuropathic = injury or pathology to nerve tissue can be seen, but may see no direct cause for pain but pain is perceived by the brain; affects sensory or motor neurons in the peripheral nervous system
- For Further Reading: www.continuingedcourses.net/active/courses/course016.php

10

How Chronic Pain Syndromes Develop: Overview

- Development of a chronic pain syndrome appears to reflect a ***failure to adapt*** (Epping-Jordan et al., 1998). Pain symptoms do not have to grow worse (although they may be *perceived* that way). Instead, the **individual cannot cope** with the unimproved symptoms.
- Presence of factors that interfere with adaptation (e.g., depression; kinesiophobia; inactivity; relationship problems) may promote the development of pain syndromes.
- Neurological injury may contribute

11

Treatment of Chronic Pain Syndromes: Overview

- The presence of a chronic pain syndrome strongly suggests that medical interventions alone (including surgery) ***will often not be very effective***. Therefore, accurately diagnosing the physical and psychological condition is critical to effective treatment.
- The most effective treatments incorporate both **psychological and physical components** provided by an interdisciplinary team (medical, psychological, physical therapy).
- **Early treatment** of pain syndromes may improve employment-related outcomes, but even those with longstanding syndromes generally improve dramatically (Epping-Jordan et al., 1998).

12

Developing a Chronic Pain Syndrome

- Likelihood of developing a Chronic Pain Syndrome is *unrelated* to pain intensity (Epping-Jordan et al., 1998; Klapow et al., 1993).
- *Psychological variables* (e.g., depression; somatic focus) and ***self-perceived disability*** consistently have been found to be the most accurate predictors of subsequent pain syndrome development (Gatchel et al., 1995).

13

The Relationship Between Chronic Pain and Traumatic Brain Injury

14

Pain and Traumatic Brain Injury

- Commonalities (P/TBI)
  - Headaches
  - Tinnitus
  - Neuropathic Symptoms
  - Spasticity
  - Deep Vein Thrombosis
  - GI difficulties
  - Orthopedic Disorders
  - Musculoskeletal dysfunction
  - Other medical issues
- Mood/Life Changes
  - Depression is possible
  - Anxiety is possible
  - Impulsivity is possible
  - Memory/Concentration changes possible
  - Altered processing speed/cognitive changes
  - Awareness or willingness to recognize possible
  - Lifestyle/Relationship issues

15

Chronic Pain Syndrome Symptoms

- Reduced activity*
- Impaired sleep*
- Depression
- Anxiety/PTSD*
- Suicidal ideation*
- Social withdrawal*
- Irritability and Fatigue*
- Strong somatic focus*
- Memory and cognitive impairment*
- Family Complications*
- Less interest in sex (or too much? – agitation)*
- Relationship problems*
- Pain behaviors*
- Helplessness*
- Hopelessness*
- Alcohol abuse*
- Medication abuse*
- Guilt*
- Anxiety (phobia/general)
- Poor self-esteem*
- Loss of employment*
- Kinesiophobia*
- Impulsivity (TBI)*

*Carryover among depression, anxiety, TBI

16

Pain/TBI Considerations

- Chronic Pain and Brain Injury are not necessarily exclusive, independent factors
- Often function in an interactive manner that results in increased symptom intensity associated with increase in each respective condition (e.g., increased pain and increased neurological condition/symptoms, respectively)
- Poorly managed pain can act as a trigger for behavioral/emotional conditions (restlessness/agitation) for which TBI patients may already be at risk
- Pain has been shown to affect quality of cognitive abilities (e.g., memory, concentration, processing speed)
- TBI may make patients more vulnerable to the side effects of medications (e.g., cognitive changes) – this can include medications in several different classes
- Need to help patients maintain consistency/follow-through on treatment plans – address things in writing, use of calendars, notes, compensatory measures

17

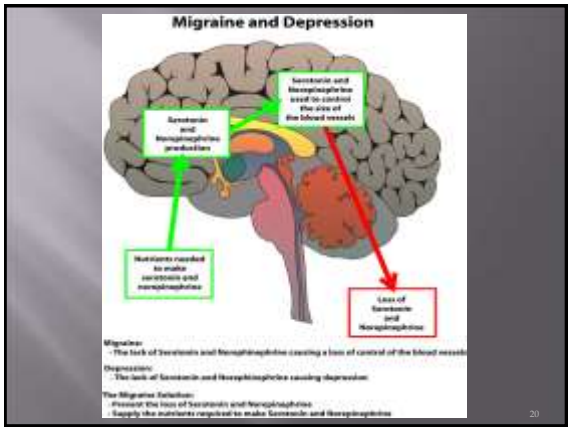
Depression and Chronic Pain

- **RATE** of depression about 3-4 times higher among those with chronic pain than in the general population (Sullivan et al., 1992).
- Depression repeatedly found to be one of the best predictors of pain intensity and pain-related impairment (Keefe et al., 1986; Leino & Magni, 1993).
- **COURSE:** Risk highest within 2 years following pain onset (Turner & Romano, 1984; Love, 1987).
- **CAUSE OR EFFECT? Depression → Pain or Pain → Depression…** Contradictory results thus far. e.g., Atkinson et al. (1991), Dworkin et al., 1992, Gamsa, 1990, Leino & Magni (1993), Zelman et al., 1991.

18


CURRENTLY ON
Zoloft
Prozac
Paxil
Buspar

19


Migraine and Depression

20

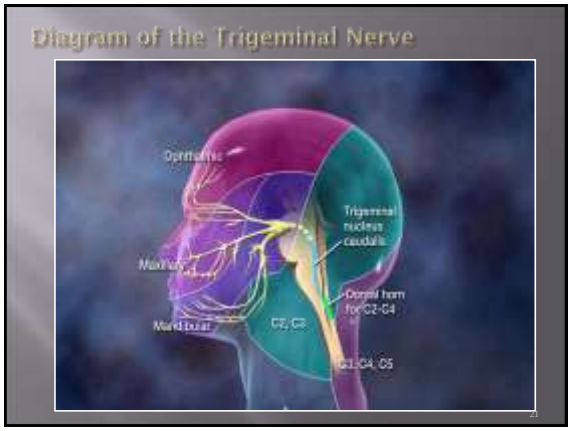


Diagram of the Trigeminal Nerve
Ophthalmic
Trigeminal nucleus caudalis
Maxillary
Dorsal horn for C2-C4
Mandibular
C2, C3
C1,C4, C5

Anxiety and Chronic Pain

- Less well studied than depression.
- **RATE:** Lifetime and point prevalence is higher for chronic LBP patients than for the general medical population (Atkinson et al., 1991).
- **CAUSE OR EFFECT:** Unclear. As likely to predate pain as to develop following pain onset.
- Appears to exacerbate pain, and in some cases increases muscle tension which may increase pain (spasticity may relate to increases in tension/pain experience)

22

Anger and Chronic Pain

- Some chronic pain patients (especially low back pain patients) have anger issues – this can promote psychophysiological tension/arousal
- However, anger levels are no higher for individuals with CLBP than for the general population (Clark, 1991).
- When anger *is* present, it may exacerbate depression (Wade et al., 1990), intensify pain (Kerns et al., 1991), and increase emotional distress (Clark, 1991).
- Brain injury can induce emotional changes/lability.

23

TBI and Pain Reports

- Hospital Pain Reports/TBI (Hoffman et al, 2005)
  - At 1 year post injury 72.6% of brain injured patients complained of some type of pain
  - 47.2% reported mild pain
  - 25.4% reported moderate to severe pain
  - Risk Factors for continued/higher pain reports:
    - Female gender, lower functional status, and depression led to increased pain severity reports
    - This does not mean that males do not have pain!

24

TBI Pain Reporting

- Uomoto and Esselman (1993) reported that 95% of mild TBI patients and 22% of patients with moderate to severe TBI reported "some kind" of pain problem
- Patients with TBI (no matter the TBI severity) were 2.5x more likely than non-TBI/neurologic patients to report some kind of pain complaint

25

Spasticity

- Rigidity and/or Dystonia present
- Joint contracture (may be seen more in males?) – painful positioning and resistance to stretching for some patients
- May result in some resistance to physical examination (painful to complete)
- Some patients (with more severe TBI) may not be able to communicate the level of pain (verbal communication deficits)
  - Provider/observer must be attuned to body language or more subtle pain behaviors to diagnose/understand patient's pain experience and communicate that to the health care provider in such situation(s)

26

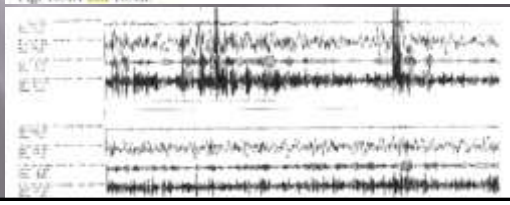
Spasticity Interventions

- Massage may be attempted if it can be tolerated (and is medically indicated)
- Some research has found accupuncture to be beneficial for short term relief of chronic musculoskeletal conditions (Goddard, 2005; Fibromyalgia - Targino et al, 2002).
- Neurofeedback has also been found to be helpful (multiple citations)
- More commonly used treatments – medications (muscle relaxers or pain meds), denervation, intrathecal pain delivery, surgery, physical therapy
- Some use of electrical stimulation therapies has been utilized (hemiplegia and spasticity; Price et al, 2000; Turner-Stokes et al, 2002; Yu, 2004).
- Neurofeedback has been found to be helpful (Budzynski et. al, 2009)

27

Spasticity and Neurofeedback

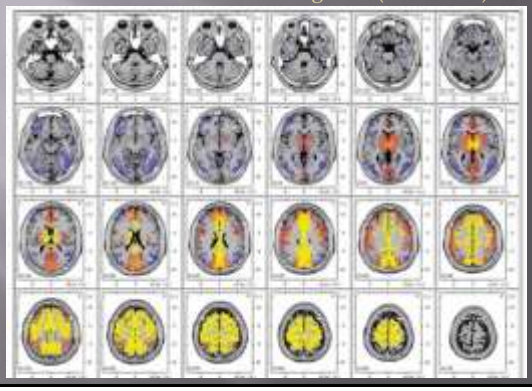
As an example, the Case 3 protocols were designed following the peripheral symptoms, such as for leg spasticity, and pain; the electrodes were placed over the central sensory motor area over the vertex at the Cz position. The BOSHI training was set for complex adaptive modality (CAM) for the light stimulation, to inhibit high beta frequency over 25 Hz, or Hilbert[3]. The effect was enhanced by using the electromagnetic stimulation, concomitantly. The hands tremor ceased when the electrodes were placed over the C3/C4 positions (where the motor control projection of the hands is located on Penfield's homunculus), and the training was designed to enhance S14 (SMR, 14) or SMR, 12–15 Hz (while Theta and Hilbert were discouraged). The sessions done on BOSHI 1, monitored and recorded on Neurocybernetics, and the changes in EEG presentation shown in Figs 16.4A and 16.4B.



The Usefulness of Quantitative EEG (QEEG) and Neurotherapy in the Assessment and Treatment of Post-Concussion Syndrome

29

We Can "See" Tinnitus and Target it: (sLORETA)



TBI and Pain Location -Headaches

- Studies on this subject are limited regarding brain injury and where people experience chronic pain, however…
- So far, results suggest most common pain location? → The Head
  - 50% to 75% of most "mild" TBI patients reporting headache(s) at severe pain levels (Yamaguchi et al, 1992; Couch et al, 2001; Uomoto et al, 1993, Lahz et al, 1996)
  - Studies (albeit few have been done thus far) suggest that the more severe the TBI, the less severe the headache.
  - Why is this? One hypothesis → Patients with more severe TBI may treated with paralytic agents (neuromuscular blocking causing anesthesia like effects) and best rest thus allowing for healing, whereas less severe TBI may not be recognized or treated, or less seriously injured patients may continue to strain muscles/ligaments in neck/shoulders (in case of headaches for instance) thus promoting continued injury (Zasler et al, 1999; Martelli et al, 2004).

31

II - PSYCHOLOGICAL EVALUATION OF PAIN

Issues with Psychological Evaluation

What is Psychological Testing?
Reliability
Validity
Standardization
Some Types/Categories of Tests
What We Measure
Treatment Planning
Case Example

The Psychological Evaluation

Why a psychological evaluation?

The overall goal evaluation is to identify as many influences on the patient's pain experience as possible and to target treatments accordingly. Referral for a psychological evaluation might be considered for any of a number of reasons:

- To round out a more complete evaluation of relevant factors influencing pain and associated symptoms (e.g., fatigue, sleep disturbances, cognitive processing problems, distressing emotional reactions).
- To identify psychological or behavioral processes (e.g., unhealthy pacing of activities, stress reactions) that might influence pain and related symptoms.
- To provide diagnoses of psychological conditions amenable to treatment, some of which (such as depression or anxiety disorders) might actually be part of a negative cycle with pain.
- To facilitate marital/family, work, or other adjustments.
- To identify problematic communication issues with health care providers.
- To help screen appropriate candidates for invasive/interventional procedures such as implantable medication pumps, spinal cord stimulators, spinal injections, and others, and provide additional rehabilitation recommendations.

*Oregon Health and Science University (2005)

34

What is Psychological Testing?

- **Psychological testing** is the use of [small] samples of behavior in order to infer larger generalizations about a given individual. The technical term(s) for psychological testing is psychometrics or psychometric testing.
- By samples of behavior, we mean observations of the individual over a limited amount of time performing tasks which have usually been prescribed beforehand, often with a great deal of research into the responses of members of a norm group.
- These responses are often compiled into statistical tables that allow the evaluator to compare the behavior of the individual being tested to the responses of the range of responses given by people in the norm group.
- A useful psychological measure must be both valid (actually tests what it claims to test) and reliable (does it consistently).

35

Reliability

a measure of the test's consistency. A useful test is consistent over time. As an analogy, think of a bathroom scale. If it gives you one weight the first time you step on it, and a different weight when you step on it a moment later, it is not reliable.

Similarly, if an IQ test yields a score of 95 for an individual today and 130 next week, it is not reliable.

Reliability also can be a measure of a test's internal consistency. All of the items (questions) on a test should be measuring the same thing -- from a statistical standpoint, the items should correlate with each other.

Good tests have reliability coefficients which range from a low of .65 to above .90 (the theoretical maximum is 1.00).

When used appropriately, psychological tests often have higher reliability and validity results than medical tests (per Meyer et. all, 2001)

36

Validity

a measure of a test's usefulness. Scores on the test should be related to some other behavior, reflective of personality, ability, or interest. For instance, a person who scores high on an IQ test would be expected to do well in school or on jobs requiring intelligence.

A person who scores high on a scale of depression should be diagnosed as depressed by mental health professionals who assess him.

A validity coefficient reflects the degree to which such relationships exist. Most tests have validity coefficients (correlations) of up to .30 with "real world" behavior. This is not a high correlation, and emphasizes the need to use tests in conjunction with other information.

Relatively low correlations mean that some people may score high on a scale of schizophrenia without being schizophrenic and some people may score high on an IQ test and yet not do well in school. Correlations as high as .50 are seen between IQ and academic performance (Pearson Assessments)

Standardization

Process of trying out the test on a group of people to see the scores which are typically obtained. In this way, any test taker can make sense of his or her score by comparing it to typical scores. This standardization provides a mean (average) and standard deviation (spread) relative to a certain group. When an individual takes the test, she can determine how far above or below the average her score is, relative to the normative group.

When evaluating a test, it is very important to determine how the normative group was selected. For instance, if everyone in the normative group took the test by logging into a website, you are probably being compared to a group which is very different from the general population.

Standardization also references the fact that the same procedures and rules are applied to each person undergoing the same measure/assessment procedure.

Types of Psychological Tests

- Intellectual
- Personality/Character-Based
- Neuropsychological
- Forensic
- Vocational
- Psychoeducational/Achievement
- Adaptive Skills

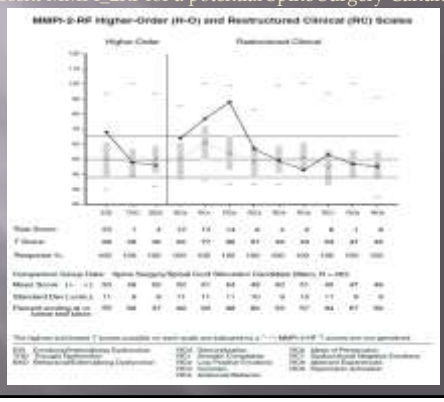
39

Some of the Tests Used at Pain Management

- Marlowe Crown - a measure of social desirability and pain coping (Crowne/Marlowe/1960)
- Pain Self Efficacy - self control in presence of pain (Nicholas/1989)
- Pain Catastrophizing - worst case thinking about pain (Sullivan et. al/1995)
- Injustice Experience Scale - emotional distress with pain (Sullivan et. al/2008)
- SOAPP and ORT - substance risk screening (Butler et. al, 2008; Webster et. al, 2005)
- MMPI-2 and MMPI-2RF (and MMPI-3 in development):
  - Objective self-report measure that assesses personality characteristics and pathological conditions affecting behavior
- Millon Behavioral Medicine Diagnostic (MBMD)
  - Objective self-report measure assessing personality characteristics that affect health and coping abilities
- *MMPI-2/RF and MMPI-3, MBMD = © Pearson Assessments.
- Reference material obtained from Pearson Assessment's website.

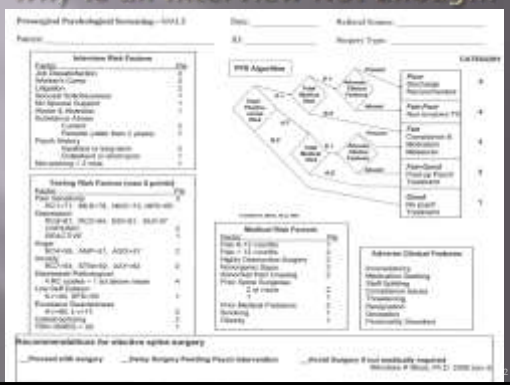
40

A Recent MMPI_2RF for a potential Spine Surgery Candidate



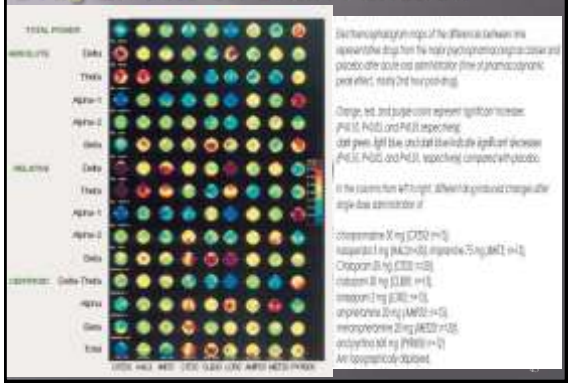
41

Why Is an Interview Not Enough?



42

Drug Effects on Brain Function



Medication Effects/Artifact(s)

Artifact -medications

Benzodiazepines, Barbiturates and Tranquilizers can significantly increase beta activity particularly beta over 20 Hz. There may also be a slight decrease in alpha. They also increase sleep spindles (Fisch p 417).

Marijuana will increase alpha and you can easily see this the next day.

Some Antidepressants may decrease alpha activity. Tricyclics may produce generalized asynchronous slow waves and spike and wave discharges. Although they decrease alpha and also perhaps low beta they may increase high beta. They also increase sleep spindles

Lithium use can result in generalized asynchronous slowing and some slowing of alpha. It may increase theta.

Phenothiazines, Haloperidol and Rauwolfia derivatives may slow alpha and produce asynchronous slow waves even at non toxic doses. There may also be increased synchrony.

Other Drugs -Street use

Drugs have major effects on brain neurotransmitter activity.

Cocaine and Ritalin, for example, are taken up by the basal ganglia (Amen, 1998 p 86) and enhance dopamine availability giving a high feeling. The cocaine 'reward' effect may be due to its stimulation of the ventral tegmental area (Bozarth, 1987)

Alcohol can increase beta (usually above 20 Hz) and decrease thalpha and alpha. Stimulants can produce some increase in beta and possibly a decrease in theta. The theta decrease may, in part, be secondary due to increasing alertness. However, we usually see minimal if any effect in the children who are training for ADHD using NFB.

Caffeine & Nicotine will suppress alpha and theta. Withdrawal may result in an increase in alpha and theta frontally.

LSD & Cocaine both increase fast activity. LSD, however, will decrease alpha whereas Cocaine tends to increase it.
Phencyclidine (PCP) increases slow activity.

Heroin and Morphine will increase slow alpha initially but this is followed by a decrease in alpha and an increase in theta and delta.

B.L. Jacobs. 1987. How Hallucinogenic Drugs Work. "American Scientist". 75:386-92.

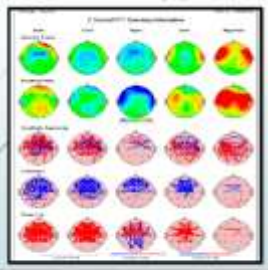
Medication Class Effects on EEG

Family	Drugs	Purpose	EEG Impact
Neuroleptics	Haldol, Prolixin, Thorazine, Mellaril	Sedative	Increase delta, theta and beta above 20 Hz and decrease alpha and beta below 20 Hz.
Neuroleptics	Seroquel, Risperdal, Geodone	Mild sedative and antipsychotic medications	Decrease alpha and increase beta in general.
Anxiolytics	Valium, Halcion, Librium, Dalmane	Anxiety relief	Decrease alpha and increase beta, especially 13-20 Hz beta
Benzodiazepines	Valium, Xanax, and Ativan	Anxiety, panic relief	Decrease alpha and increase 20-30 Hz beta
SSRIs	Prozac, Paxil, and Zoloft	a class of antidepressants used in the treatment of depression, anxiety disorders, and some personality disorders.	Decrease in frontal alpha and a mild increase in 18-35 Hz beta.
MAO Inhibitors	Marplan, Parnate, Eldepryl	Antidepressant	Tendency to increase 30-35 Hz beta while decreasing all other frequencies
Tricyclic antidepressants	Imipramine and Amitriptyline	Useful in depressed patients with insomnia, nightmares, and nervousness	Increase delta and theta while decreasing alpha; increase beta 25 Hz and up band

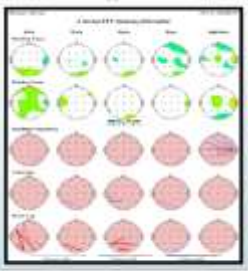
Family	Drugs	Purpose	EEG Impact
Antipsychotics	Lithium	Used for the treatment of manic/depressive (bipolar) and depressive disorders	Increases theta, mildly decreases alpha and increases beta
Amphetamines	Adderall, Vyvanse, and Dexedrine	a group of drugs that act by increasing levels of norepinephrine, serotonin, and dopamine in the brain	Decrease slow-wave activity and increase beta in the 32-36 Hz range
Marijuana		Recreational	Increases frontal low frequency alpha; affects EEG for three days
Opiates	Opium, hydromorphone, oxymorphone, heroin, morphine, oxycodone, Talwin, sedalone, methadone, meperidine, hydrocodone, Vicodin	Pain relief	Generate high amplitude slow alpha in the 8 Hz range
Barbiturates	Brevital, thiomylal (Surital), thiopental (Pentothal), amobarbital, Amytal, pentobarbital, Nembutal, secobarbital, Seconal, Tuinal, Phenobarbital, Luminal, mephobarbital, Mebaral	Produce a wide spectrum of central nervous system depression, from mild sedation to coma, and have been used as sedatives, hypnotics, anesthetics, and anticonvulsants	Increase beta at 35-45 Hz amplitude
Caffeine		Increases alertness	Increases beta and decreases slower waves

Case Study 1 - ASD

Brain Maps of 11-year-old Boy with Severe ASD symptoms



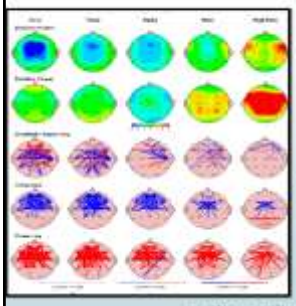
Brain Maps of 12-year-old Neurotypical Child



It shows the precise locations and frequencies at which your client's brain deviates from normal function. This information can be combined with symptoms and client self-report, to create a model of why your client has his or her individual pattern of thinking and behavior. This information is helpful to understand your client, as well as to plan and evaluate interventions.

What is a QEEG?

What does a brain map tell me?



What recording condition is it in?

Where is it?
(in what geographical region is the activity)

What is it?
(which metric is being examined)

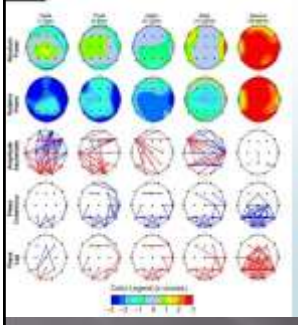
What frequency is it in?

Is it high or low?
(is the activity excess or deficit compared to the database norms)

What is everything else doing?
(the context of the overall neural and physiological dynamic)

QEEG Defined

Glossary of Important Terms:



Absolute Power: measurement of raw energy output at each site during recording compared to normative database

Relative Power: distribution of energy resources being utilized during recording among the frequencies measured compared to normative database

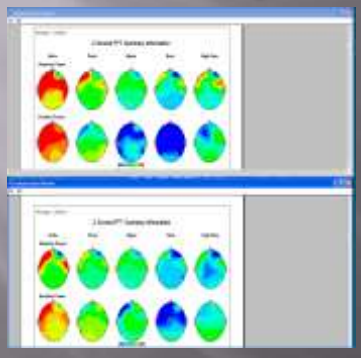
Amplitude Asymmetry: average difference between signals measured compared to normative database

Coherence: variability of neural activation and delay between sites compared to normative database (rate of shared information)

Phase Lag: average of the delay between processing sites compared to normative database
(speed of shared information)

50

Case 2 – EEG & Migraine Meditation



5 Minutes of Brain Activity – Pre-Meditation

Brain Activity after 10 Minutes of Meditation

51

"Visualize yourself not falling off the wall."

52

Meditation

A Wake Forest University study conducted by Fadel Zeidan in April 2011 took 15 healthy volunteers and performed MRI scans of their brains while inducing pain. In the four days that followed, a certified instructor taught the subjects mindfulness meditation (in which the patient is taught to focus on a sense/experience, often his or her breath, while accepting transient thoughts). On the fifth day, the researchers scanned the volunteers again, once while not meditating, and another time while meditating, with pain induced (heat probe) during both sessions. The study showed an approximately 40 percent reduction in pain intensity ratings during meditation when compared with non-meditation. (Many other studies document pain relief via meditation as well).

The Effects of Brief Mindfulness Meditation Training on Experimentally Induced Pain. Fadel Zeidan, Nakia S. Gordon, Junaid Merchant, and Paula Goolkasian. The Journal of Pain (2009).

53

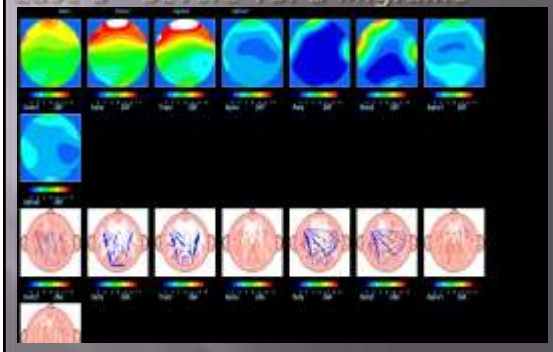
5 Immediate Meditation Benefits

- Reduced Blood Pressure and Improved Immune Functioning
- Sharpened Mental Skills (e.g., Attention, Concentration)
- Increased Serotonin levels (boost mood, reduce anxiety)
- Meditation (20 mins/day) = Improved Sleep
- More Mediation = Less Stress and Better Cardiovascular Functioning

Source: WebMD, HearthMath.com (relates to HRV training)

54

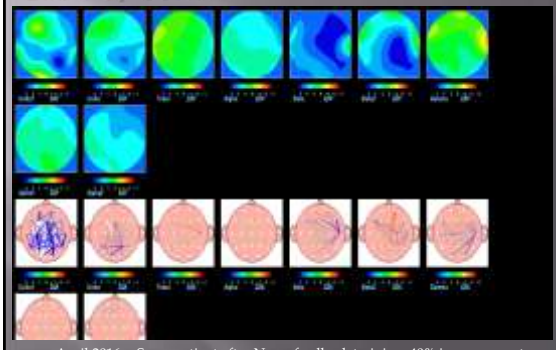
Case 3 – Severe TBI & Migraine



November 2015 – 2D Frequency Maps, Migraine and Tinnitus

55

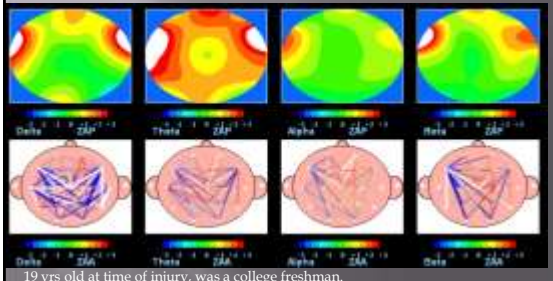
Case 3, Cont…



April 2016 -- Same patient after Neurofeedback training, 40% improvement in Tinnitus, 70% improvement in Migraines

56

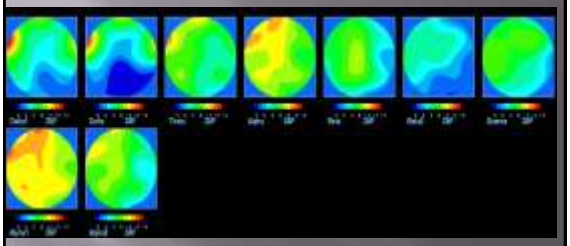
Case 4 – Severe TBI, global injuries across major cognitive abilities (but no pain!)



19 yrs old at time of injury, was a college freshman.
30 foot fall, GCS = 3 when ambulance got him to hospital.
I saw him 2 years after injury. 21yrs old at time of this qEEG.
Speech, memory, attention, impulsivity impairment, etc.

57

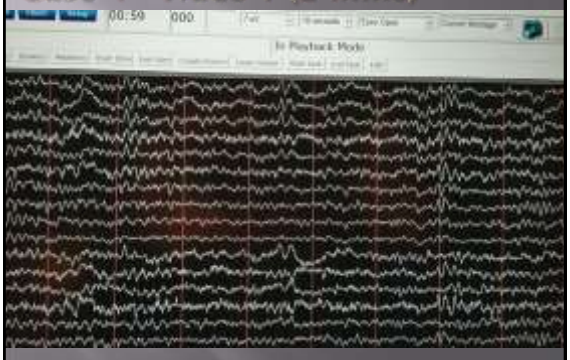
Case 4, Cont…



Now 23 years old. Neurofeedback training, qEEG as of July 31, 2017 (age 22) – Still see deficit areas namely over the Left Frontal lobe (increased delta/slowing – some executive functions), too little slowing in the Right Parietal/Occipital lobes (spatial, body awareness, math/spelling). But, notice more "normalization" across the brain compared to June 2016.Training continues – he is excelling in Speech functions now – 100% on speech/vocabulary tests (NF training and speech therapy, did not achieve this with speech therapy alone), , long term memory has returned.

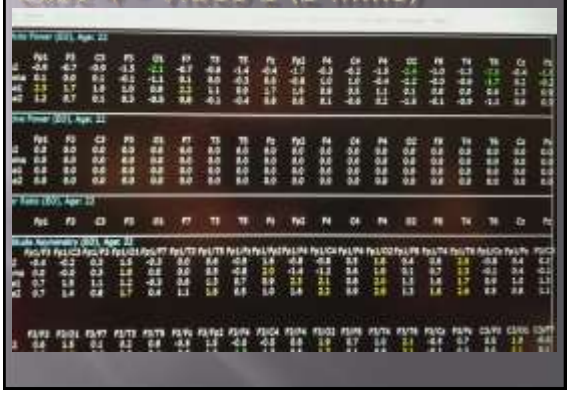
58

Case 4 - Video 1 (2 mins)

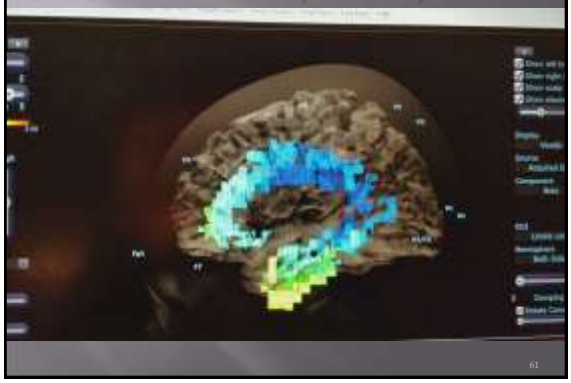


59

Case 4 – Video 2 (2 mins)



Case 4 – Video 3 (5 mins)



61

THE PSYCHOLOGY OF BRAIN INJURIES

62

Things to Watch For…

(c/o Tilia Trudel, PhD - Ref to Tropics)

- Agnosia – impairment in recognition not based in sensory or motor impairment
- Anosognosia – lack of knowledge about a deficit, loss of recognition – L. hemiplegia example
- Denial of Illness – implies psychological mechanism of blocking awareness
- Insight – multidimensional mechanism that permits understanding of deficits
- Anosodiaphoria – indifference, absence of concern regarding acknowledged deficit
- Anhedonia – lack of pleasure/interest (sign of depression)

63

Injuries and Behavior

- Frontal Lobe – Limbic:
  In this case -- lesions cause damage to the connections between the frontal cortex and the limbic (emotional) and reticular systems (activating).

- Behavior
  Injury(ies) thus affect executive functions leading to dysregulation and disruption on in managed behaviors; disinhibition, changes in affect and impaired awareness to self-regulate and monitor.

EXECUITVE ABILIITES:

- Self Awareness – most complex
- Planning, Prediction & Judgment
- Initiation, Sequencing & Organization
- Self monitoring & Correction
- Emotional regulation
- Behavioral control
- Problem solving

TBI and Mood/Recovery

- Increased awareness may be associated with depression - Deficit-focused personality style
- However, in some outcome studies, underestimators and accurate estimators both faired better than overestimators.
- Impaired awareness is associated with apathy , poorer emotional adjustment, diminished motivation, lack of emotional distress, and lower generalizability of skills outside of the therapy/rehabilitation session
  - Hoofien et al., 2004; Flashman & McAllister 2002

65

How to Treat TBI/Emotions

- Psychotherapeutic Treatment
  - Focus on exploring meaning of losses and impairments, accurately recognize new strengths and weaknesses and develop coping skills
  - 'Not knowing' about deficits:
    - Lack of access or ability to understand
    - Neuropsychological difficulty gleaning implications
    - Emotional pain and denial
  - Group and individual therapy
    - Performing activities, review of work and progress, continually monitor readiness.

Fleming and Ownsworth (2006)

66

Structured Experiences

Focuses on task knowledge, self knowledge and beliefs (metacognition)

And… situational awareness during task performance (on-line awareness)

Uses guided mastery experiences that allow for self-monitoring and self-evaluation

Anticipatory training (examine obstacles and strategies); self-prediction training (difficulty, speed and accuracy); time monitoring; self-checking; self- evaluation; self-questioning; role reversal are all tools used

Direct Feedback

Best for impaired awareness due to impairment of cognition as opposed to psychological denial (resistance and high emotional arousal to feedback) or neurological basis (passive response and indifference to feedback).

Feedback can be via individual, small group, videotape or audiotape methods

Subcomponent of other holistic approaches

67

Game formats

- Educational board games used as therapeutic tools
- Non-threatening and exploratory
- Knowledge may improve, but not necessarily increased accuracy of self-appraisal

Support Groups

- Psychoeducational programs in nature
- Benefit from peer feedback
- Opportunity to practice skills
- Included within comprehensive treatment packages

Behavioral Interventions

- Increase or decrease target behaviors and develop skills collaboratively with individual
- Self awareness may not be relevant or necessary for certain rehabilitation and functional gains to occur
- Behavioral/functional status may improve without gains in awareness
- Use learning principles and habit formation for compensatory techniques

- Interventions for Children
  - Low to high confrontation approaches (also a dynamic with adult interventions)
  - Serious or excess confrontation may result in increased anger or denial
  - Critical to consider developmental tasks, needs and identity formation challenges

***Other (Adult or Children)

Denial of illness may be adaptive

Externalized coping style

Breakdown of cognitive or sensory systems

Integrated frontal system of self-awareness, self-reflectiveness and self-monitoring not functioning effectively

May be able to analyze other's behavior more accurately than own behavior

May be more accurate for concrete (physical) than abstract (psychosocial) judgments

69

Headache Interventions

- Medications (prophylactic, prn/episodic)
- Injection Therapy
- Psychological Treatment (CBT)
- Diet/Lifestyle Modification
- Botox
- Biofeedback - Neurofeedback
- Relaxation Therapies
- Herbals
- VNS – Just FDA approved

"The time to relax is when you don't have time for it" – Sydney J. Harris (journalist)

70

Medications Types for Migraine

- Some Medication Types
  - Pain Killers (Opiate vs. Non-Opiate/NSAIDs)
  - Triptans (Abortive; Imitrex, Relpax, etc.)
  - Anti-Epileptics (seizure drugs that help with migraines – Neurontin, Topamax, Depakote, etc.)
  - Cardiovascular Drugs (regulate blood pressure, cardiac function – Inderal, Verapamil, etc.)
  - Serontonin Agonists – aka Antidepressants (alter levels of Serotonin in the brain)
  - Ergots
  - Alternatives (e.g., herbs – Feverfew)
- Medication Protocols
  - Prophylactic (Everyday Preventative)
  - Abortive (Acute Headache, take when present)

71

The Triptan Medications

- The **Triptans** appear to work by stimulation of 5-HT1B and 5-HT1D receptors. During a migraine attack, the trigemino-vascular system is activated, particularly peripheral blood vessels and the trigeminal nerve. This nerve communicates peripherally with these blood vessels and centrally with the trigeminal nuclei.
- The important receptors are serotonergic, as the blood vessel is driven by the 5-HT1B and the trigeminal nerve by the 5-HT1D subtypes at both ends.
- Medications in this class include: sumatriptan (Imigran® or Imitrex®), zolmitriptan (Zomig®), naratriptan (Naramig ® or Amerge®) and rizatriptan (Maxalt®). All these drugs are used for migraine headache treatment in clinical practice but the mainstay is still sumatriptan. Three relatiely new triptan medications have arrived, and they include eletriptan (Relpax), frovatriptan (Frova), and almotriptan (Axert).
- Imitrex is the most prescribed migraine medication in the U.S.

72

Ergotamine Medications

- **Ergotamine:** The use of ergotamine has been almost completely superseded by the triptans because of its potential to cause acute side effects, such as nausea, abdominal pains and cramps, and also because of its relatively low efficacy, particularly in the oral formulation. **Patients who are currently using ergotamine for migraine headache treatment on an infrequent basis and who find it efficacious without side effects would appear to be using the drug optimally and do not necessarily require a change in therapy**.
- The most worrying aspect would be the possibility of increasing use of ergotamine leading to ergotism, a form of **chronic daily headache**. In this circumstance, the patient should be referred for further assessment/treatment.
- Ergots = vasoconstriction, prolonged use/higher doses may see rebound headache

73

Cardiovascular & Anti-Epileptic Medications

- **Beta-blockers:** This class of drug is the most commonly used world-wide for migraine prophylaxis. Beta-blockers are contraindicated in patients with conditions such as asthma and peripheral vascular disease. Propranolol, atenolol, metoprolol and timolol are all used, although propranolol is the most commonly prescribed. Approach for migraine headache treatment is to start with a low dose (10mg bd), building up gradually. Inderal LA 160mg or Half-Inderal LA 80mg is commonly used, but the larger daily dose does confer the problem of additional side effects. One analysis of propranolol reported that, on average, there was a 44 per cent reduction in the frequency, duration and intensity of migraine attacks.
- The **calcium channel blockers** vary in efficacy against migraine. Flunarizine is reported to be effective. The evidence for nimodipine, nifedipine, and verapamil is difficult to interpret, and all have the potential for adverse events.
- **Anti-epileptics**: Of the anticonvulsant drugs, divalproex sodium and sodium valproate are effective but have frequent side effects, including nausea, alopecia, tremor, weight gain, and sleepiness, as well as potentially serious congenital, hepatic, and pancreatic toxicities. Topiramate has shown ability to reduce migraine frequency and is associated with weight loss, but the studies were complicated by high dropout rates

Behavioral and Emotional Factors Related to TBI

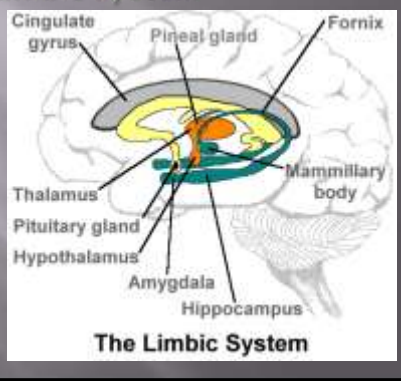
- Mood/Anxiety Disorders occur frequently in chronic pain patients and those with TBI
- Mood/Anxiety can impact on cognitive abilities and pain experiences
- Pain and TBI effects can create a "feedback loop" (Sherman et al, 2006) promoting further disability, discomfort, and cognitive decline

75

A Brief Primer on Pain Related Nervous System Functions

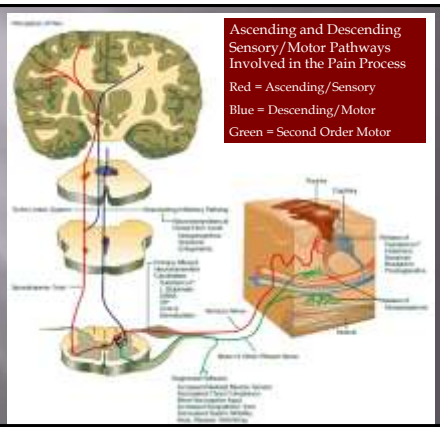
76

The Limbic System



The Limbic System

77



Ascending and Descending Sensory/Motor Pathways Involved in the Pain Process

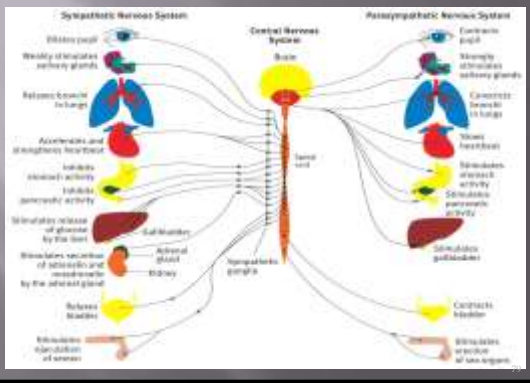
Red = Ascending/Sensory

Blue = Descending/Motor

Green = Second Order Motor

78

Sympathetic and Parasympathetic Projections



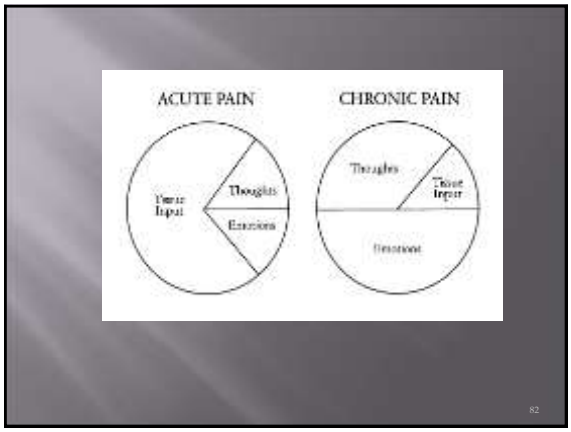
Physical and Emotional Pain Pathways

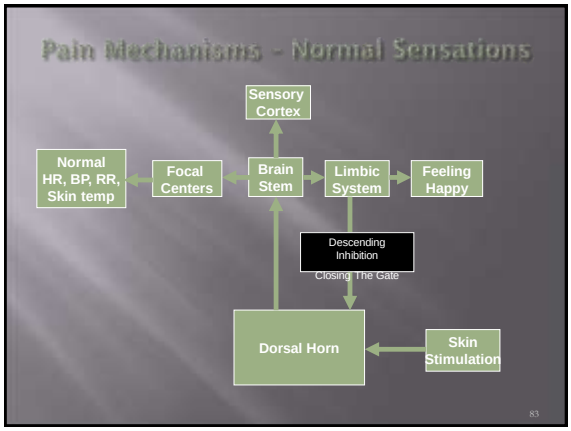
80

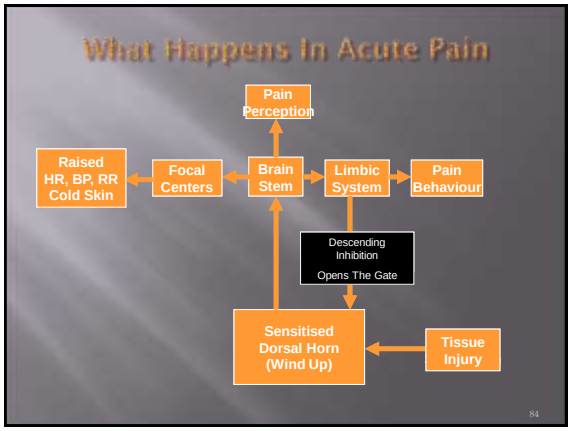
The Gate Control Theory

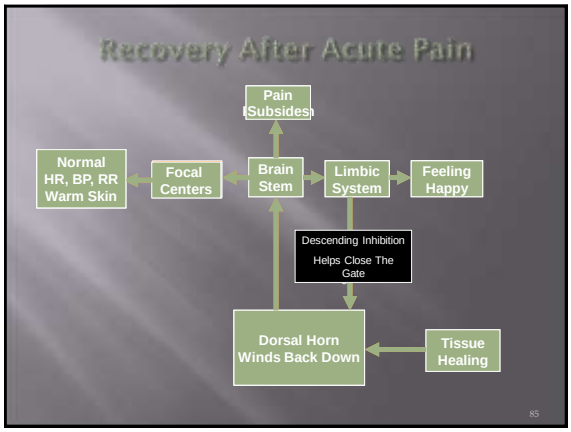
- Proposed by Melzack and Wall (1965)
- The Gate Theory purports to account for the clinically recognized importance of the mind and brain in pain perception (noting Beecher)
- Tries to account for influence of mental as well as physical aspects of pain perception
- Focus on the Nervous System and Cognition/Emotional State
  - Central (Brain and Spinal Cord)
  - Peripheral (nerves that branch out to body components …organs, tissue, lumbar roots, etc.)

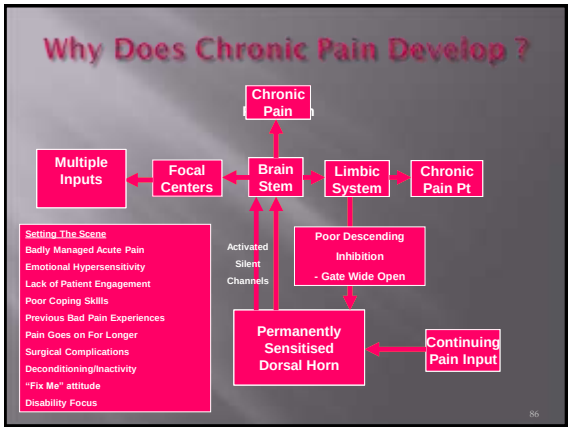
81

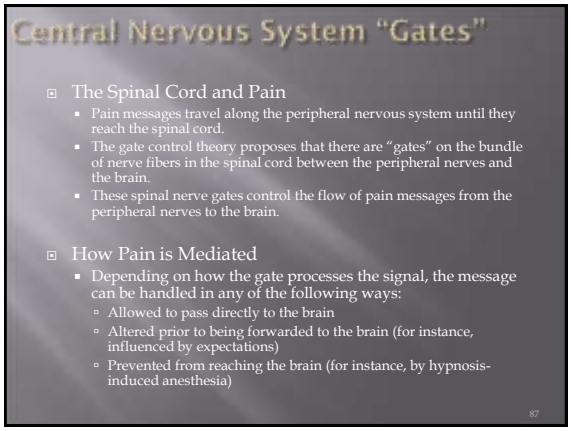

ACUTE PAIN
CHRONIC PAIN
Thoughts
Emotions
Thoughts
82


Pain Mechanisms - Normal Sensations
Sensory Cortex
Normal HR, BP, RR, Skin temp
Focal Centers
Brain Stem
Limbic System
Feeling Happy
Descending Inhibition
Closing The Gate
Dorsal Horn
Skin Stimulation
83


What Happens In Acute Pain
Pain Perception
Raised HR, BP, RR Cold Skin
Focal Centers
Brain Stem
Limbic System
Pain Behaviour
Descending Inhibition
Opens The Gate
Sensitised Dorsal Horn (Wind Up)
Tissue Injury
84

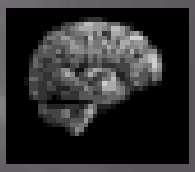

Recovery After Acute Pain
Pain Subsides
Normal HR, BP, RR Warm Skin
Focal Centers
Brain Stem
Limbic System
Feeling Happy
Descending Inhibition
Helps Close The Gate
Dorsal Horn Winds Back Down
Tissue Healing
85


Why Does Chronic Pain Develop ?
Chronic Pain
Multiple Inputs
Focal Centers
Brain Stem
Limbic System
Chronic Pain Pt
Setting The Scene
Badly Managed Acute Pain
Emotional Hypersensitivity
Lack of Patient Engagement
Poor Coping Skills
Previous Bad Pain Experiences
Pain Goes on For Longer
Surgical Complications
Deconditioning/Inactivity
"Fix Me" attitude
Disability Focus
Activated Silent Channels
Poor Descending Inhibition
- Gate Wide Open
Permanently Sensitised Dorsal Horn
Continuing Pain Input
86


Central Nervous System "Gates"
The Spinal Cord and Pain
Pain messages travel along the peripheral nervous system until they reach the spinal cord.
The gate control theory proposes that there are "gates" on the bundle of nerve fibers in the spinal cord between the peripheral nerves and the brain.
These spinal nerve gates control the flow of pain messages from the peripheral nerves to the brain.
How Pain is Mediated
Depending on how the gate processes the signal, the message can be handled in any of the following ways:
Allowed to pass directly to the brain
Altered prior to being forwarded to the brain (for instance, influenced by expectations)
Prevented from reaching the brain (for instance, by hypnosis-induced anesthesia)
87

The Role of the Brain

- Is Pain in your head? Technically, yes.
- Once a pain signal reaches the brain, a number of things can happen. Certain parts of the brain stem (which connects the brain to the spinal cord) can inhibit or muffle incoming pain signals by the production of endorphins, which are morphine-like substances that occur naturally in the human body.
- Stress, excitement, and vigorous exercise are among the factors that may stimulate the production of endorphins. The impact of endorphins is why athletes may not notice the pain of a fairly serious injury until the "big" game is over.



88

Pain and Mindset

- The brain also controls pain messages by attaching meaning to the personal and social context in which the pain is experienced. This occurs in the cortex. As per Beecher, soldiers who are wounded in combat may display much less pain than similarly wounded civilians involved in accidents. ***The meaning attached to the situation seems to be the important difference***.
- ***Henry Beecher, MD*** (1956, 1960) – mindset, placebos – (war experiences WWII, surgeon, studied the placebo effect)

89

How to Affect the Gates?

- Pain signals can be of different types (slow or fast), can travel along different pathways in the brain, and can be influenced by such things as endorphins in the brain stem. But even with all of that, the human pain system is still more elegant. The brain can send signals down the spinal cord (motor signals) to open and close the nerve gates.
- In times of anxiety or stress, descending messages from the brain may actually amplify the pain signal at the nerve gate as it moves up the spinal cord. Alternatively, impulses from the brain can "close" the nerve gate, preventing the pain signal from reaching the brain and being experienced as pain.

90

Some Factors That Open Gates

- **Sensory factors**, such as injury, inactivity, long-term narcotic use, poor body mechanics, and poor pacing of activities
- **Cognitive factors**, such as focusing on the chronic pain, having no outside interests or distractions, worrying about the pain, and other negative thoughts
- **Emotional factors**, such as depression, anger, anxiety, stress, frustration, hopelessness, and helplessness.

91

Some Factors That Close Gates

- **Sensory factors**, such as increasing activities, short-term use of pain medication, relaxation training and meditation.
- **Cognitive factors**, including outside interests, thoughts that help the patient cope with the pain, and distracting oneself from the chronic pain.
- **Emotional factors**, such as having a positive attitude, overcoming depression, feeling reassured that the pain is not harmful, taking control of one's chronic pain and life, and stress management.

92

Fatigue, Sleep, and TBI

- Fatigue and sleep problems can persist with TBI whether pain is present or not
- Fatigue and sleep can degrade coping and healing ability
- Sleep hygiene techniques can benefit sleep but may also see eventual improvement with pain due to sleep's ability to help with body healing, improved cognitive impact, and improvement on mood (Brewer el al, 2006)

93

Treatment

(not an all-inclusive list)

94

Pain Treatments

- Medical/Surgical (multiple types)
- Pharmacological (multiple types)
- Psychological (talk therapy, biofeedback, relaxation, etc.) -- Neurofeedback
- Physical Therapy (stabilization, manipulation, mobility, strengthening, etc.)
- Dietary
- Massage/Vibratory
- Accupunture
- Yoga
- Music
- Relaxation Therapies

95

Omega Three Fatty Acids

- According to emerging science and clinical experience, aggressive intake of omega-3 fatty acids (n-3FA) seems to be beneficial to TBI, concussion, and post-concussion syndrome patients. This research is presented in Concussions, Traumatic Brain Injury, and the Innovative Use of Omega-3s, a review article from the *Journal of the American College of Nutrition*, official publication of the American College of Nutrition.
- Omega Three Video

96

Treatment Strategies

- Must take into account multiple factors including other types of pain, cognitive deficits, sleep problems, anxiety/mood issues, stress
- Sometimes may be able to identify treatments that can address multiple problems simultaneously (e.g., relaxation can target pain and anxiety)
- Offer clear, direct treatment instructions
- Help develop and maintain realistic expectations
- Multidisciplinary approach is ideal when it comes to pain issues (tends to maximize functional outcomes, promotes communication)

97

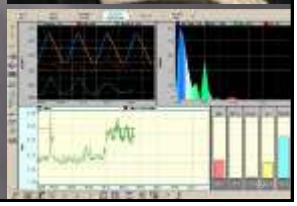
Non-Medication Treatments for Headache and Chronic Pain

- Dietary modification
- Exercise
- Education
- Social Support
- Improve your sleep
- Reduce your stress
- Keep your emotions in check
- Massage
- Acupuncture
- Hypnosis/Relaxation
- Chiropractic
- Aromatherapy
- Psychotherapy (CBT has the most support)
- Biofeedback/Neurofeedback
- Meditation

98

Biofeedback

- Biofeedback is the process of bringing involuntary physiological functions under voluntary control. Finger temperature, for instance, is a reflection of the body's level of vigilance.
- Biofeedback trains the nervous system to shut out excessive stimulation. Through biofeedback and relaxation, the individual steps back from daily concerns and focuses on returning the body to homeostasis through [for example] calming, relaxing music, visualization, and slow diaphragmatic breathing.



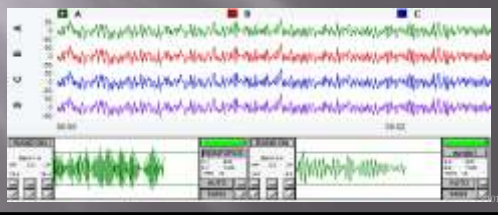
Types of Biofeedback

- Electromyographic (EMG) – muscle tension/various conditions
- Thermal – temperature
- Galvanic Skin Response – skin conductance
- Heart Rate/HRV – cardiovascular training, vagal
- Electroencephalograph – brain waves
- Photoplethysmograph – blood flow volume related to HRV
- Echocardiogram/ECG – heart rate
- Capnometer – CO2/breathing training
- Pneumograph – breathing training
- Hemoencephalography – another form of blood flow training

100

Neurofeedback (subset of qEEG)

- Use of the EEG (electroencephalogram) to measure target brain waves
- Use computer feedback to train the brain to function in a more adaptive and effective brain wave state
- Research suggests anywhere from 15 to 40 sessions of treatment to bring about effective migraine management
- Walker Study (2011) – Headache, average of 24 sessions (qEEG guided for migraine relief) – in practice, usually much shorter



Protocols - 1

qEEG Profile	Description of Pattern	Medication	Neurofeedback
Diffuse slow activity, with or without low frequency alpha.	Increased delta and theta (1-7 Hz) with or without slow posterior dominant rhythm	Stimulant	Inhibit midline frontocentral activity below 10 Hz., add reward anterior beta frequencies for increased effect
Focal abnormalities, not epileptiform.	Focal slow activity or focal lack of activity.	Stimulant	Inhibit slow activity (<10 Hz) and reward higher frequencies (> 12 Hz)
Mixed fast and slow	Increased activity below 8 Hz., lack of alpha, increased beta frequency activity	Combine across classes, e.g. stimulant + anticonvulsant?	Inhibit slow frequencies, reward middle frequencies. Reward SMR.
Frontal lobe disturbances	Frontally dominant excess theta or alpha frequency activity	Antidepressant, stimulant	Inhibit midline frontocentral activity below 10 Hz., add reward anterior beta frequencies for increased effect
Frontal asymmetries	Variable asymmetry L->R or R->L, primarily at F3, F4.	Antidepressant	Reward F3 beta, inhibit F3 theta and alpha frequencies.

Note: The above information is not intended as a substitute for professional consultation. See text for more complete descriptions.

Protocols - 2

qEEG Profile	Description of Pattern	Medication	Neurofeedback
Excess temporal lobe alpha	Increased alpha activity generated in temporal lobe	Stimulant	Inhibit 9-12 Hz activity over [illegible] regions, [illegible] slow activity
Epileptiform	Transient spike/wave, sharp waves, paroxysmal EEG	Anticonvulsant	Inhibit low and high frequencies over affected regions, central strip training, reward SCP
Faster alpha variants, not low voltage	Alpha frequency greater than 12 Hz over posterior cortex.	???	Reward 9-10 Hz alpha at Pz, shift alpha frequency lower with alpha/theta protocol
Spindling excessive beta	High frequency beta with a spindle morphology, often with an anterior emphasis	Anticonvulsant	Inhibit beta frequencies, wide band inhibit.
Generally low magnitudes (fast or slow)	Low voltage EEG overall.	Metabolic support, nutraceuticals	Reward alpha activity posteriorly.
Persistent alpha with eyes open	Lack of appreciable alpha blocking with eye opening	???	Reward beta frequencies, inhibit alpha. Reward higher frequency alpha.

Note: The above information is not intended as a substitute for professional consultation. See text for more complete descriptions.

Neurofeedback Sources

- www.aboutneurofeedback.com
- www.eeginfo.com
- www.aapb.com
- www.brainmaster.com
- www.appliedneuroscience.com
- www.braindx.com
- www.isnr.org
- "Comprehensive Neurofeedback Bibliography": https://www.isnr.org/isnr-comprehensive-bibliography

Temperature BioFeedback-- Handwarming

- The average finger temperature is 88°F. As the stress response builds in the body, the finger temperature generally decreases. When the finger temperature is chronically low (below 80°F), the body is in the survival mode, usually signifying that the individual has lost the ability to relax and re-create.
- Biofeedback trains the nervous system to shut out excessive stimulation. Through biofeedback and relaxation, the individual steps back from daily concerns and focuses on returning the body to homeostasis through calming, relaxing music, visualization, and slow diaphragmatic breathing. As this occurs, the finger temperature rises. The goal is 96°F
- Hand warming is basic to learning how to control the autonomic nervous system. Many people who experience panic attacks have cold hands much of the time. Cold hands (and feet) are indicative of the fight/flight response, which reduces blood flow to the arms and hands, legs and feet. The less warm blood from the heart that reaches your hands and feet, the cooler they will be.

When you learn to warm your hands, you take control of the sympathetic nervous system over-activity that is so much the case with panic disorder. It is easy to do and demonstrates that you are able to control the fight/flight response when you are under stress or in a trigger situation (for instance, if getting on a freeway is something that usually triggers shortness of breath and clammy hands.)

105

Other Interventions

- Cognitive-Behavioral Psychotherapy
- Chiropractic
- Accupuncture/Eastern Medicine
- Herbal Treatments
- Massage/Vibratory
- Exercise
- Diet
- Cutaneous (ice/heat/pressure)
- Medical Interventions
  - Medications, surgical procedures, etc.

106

107

Alpha Stim

Non-addictive Option For At-risk Patients and Others as Well

Alpha-Stim technology is a non-addictive therapy that is a treatment solution for patients who:

- Are addicted to, or at risk of, addiction to opiates
- Have drug interaction risk factors
- Have vocational restrictions on narcotic use
- Are elderly
- At risk due to compromised organ systems
- Are medication resistant
- Chronic Pain Patients (with or without narcotic risk)
- Depression/Anxiety, and Sleep Difficulty as well

FDA Approved, Class II

108

Alpha Stim Results

109

Psychotherapy for Pain

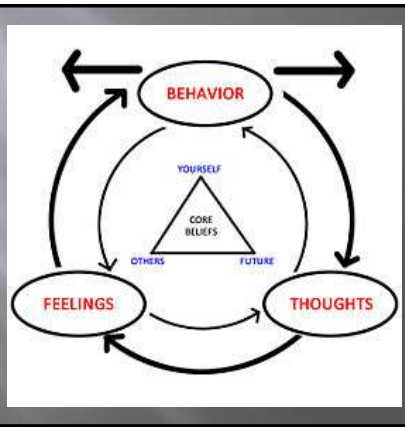
- Cognitive Behavioral Therapy (CBT)
- Acceptance-Commitment (ACT)
- Motivational Interviewing (MI)
- Interpersonal Psychotherapy (IP)

Part I
Introducing CBT Basics

111

Cognitive Behavioral Therapy (CBT)

- Has the most research support for pain patients/interventions
- CBT is a "problem-focused" and "action-oriented" form of therapy, meaning it is used to treat specific problems related to a diagnosed [mental or physical] disorder. The therapist's role is to assist the client in finding and practicing effective strategies to address the identified goals and decrease symptoms of the disorder. CBT is based on the belief that thought disortions and maladaptive behaviors play a role in the development and maintenance of [psychological disorders], and that symptoms and associated distress can be reduced by teaching new information-processing skills and coping mechanisms. (Wikipedia)



113

Acceptance/Commitment Therapy (ACT)

Acceptance and commitment therapy (ACT, typically pronounced as the word "act") is a form of counseling and a branch of clinical behavior analysis. It is an empirically based psychological intervention that uses acceptance and mindfulness strategies mixed in different ways with commitment and behavior-change strategies, to increase psychological flexibility.

ACT differs from traditional cognitive behavioral therapy (CBT) in that rather than trying to teach people to better control their thoughts, feelings, sensations, memories and other private events, ACT teaches them to "just notice," accept, and embrace their private events, especially previously unwanted ones. ACT helps the individual get in contact with a transcendant sense of self known as "self-as-context"—the you who is always there observing and experiencing and yet distinct from one's thoughts, feelings, sensations, and memories. ACT aims to help the individual clarify their personal values and to take action on them, bringing more vitality and meaning to their life in the process, increasing their psychological flexibility. (Wikipedia)

- The core concept of ACT is that psychological suffering is usually caused by experiential avoidance, cognitive entanglement, and resulting psychological rigidity that leads to a failure to take needed behavioral steps in accord with core values.
- As a simple way to summarize the model, ACT views the core of many problems to be due to the concepts represented in the acronym, **FEAR**:
  - **F**usion with your thoughts
  - **E**valuation of experience
  - **A**voidance of your experience
  - **R**eason-giving for your behavior
- And the healthy alternative is to **ACT**:
  - **A**ccept your reactions and be present
  - **C**hoose a valued direction
  - **T**ake action

115

Motivational Interviewing (MI)

- MI is a goal-oriented, client-centered counseling style for eliciting behavior change by helping clients to explore and resolve ambivalence.
- Motivational interviewing is non-judgmental, non-confrontational and non-adversarial. The approach attempts to increase the client's awareness of the potential problems caused, consequences experienced, and risks faced as a result of the behavior in question.
- Alternatively, or in addition, therapists may help clients envision a better future, and become increasingly motivated to achieve it.[2]
- Either way, the strategy seeks to help clients think differently about their behavior and ultimately to consider what might be gained through change. Motivational interviewing focuses on the present, and entails working with a client to access motivation to change a particular behavior that is not consistent with a client's personal value or goal.
- (Wikipedia)

116

Processes of MI

- Engaging: the process of establishing a working relationship based on trust and respect. The client should be doing most of the talking, as the counselor utilizes the skill of reflective listening throughout the process. Both the client and counselor make an agreement on treatment goals and on collaborate the tasks that will help the client reach those goals.
- Focusing: the ongoing process of seeking and maintaining direction.
- Evoking: eliciting the client's own motivations for change, while evoking hope and confidence.
- Planning: involves the client making a commitment to change, and together with the counselor, developing a specific plan of action.
- (Wikipedia)

117

5 General MI Principles

- Clinician practices motivational interviewing with five general principles in mind:
- Express empathy through reflective listening.
- Develop discrepancy between clients' goals or values and their current behavior.
- Avoid argument and direct confrontation.
- Adjust to client resistance rather than opposing it directly ("Rolling with Resistance").
- Support self-efficacy and optimism.
- Miller and Rollnick (1991)

118

Interpersonal Psychotherapy (IP)

- Some support for pain interventions as related to lifestyle functioning but mostly used with depression, grief, eating disorders
- The main goal of IPT is to improve the quality of a client's interpersonal relationships and social functioning to help reduce their distress.
- IPT provides strategies to resolve problems within four key areas.
  - First, it addresses interpersonal deficits, including social isolation or involvement in unfulfilling relationships.
  - Second, it can help patients manage unresolved grief—if the onset of distress is linked to the death of a loved one, either recent or past.
  - Third, IPT can help with difficult life transitions like retirement, divorce, or moving to another city.
  - Fourth, IPT is recommended for dealing with interpersonal disputes that emerge from conflicting expectations between partners, family members, close friends, or coworkers.
  - Psychology Today (https://www.psychologytoday.com/therapy-types/interpersonal-psychotherapy)

119

IV –DEALING WITH CHANGE AND ADJUSTMENT RELATED TO PAIN AND TBI

Thoughts to Ponder:

- "I think there's a world market for maybe 5 computers." - Thomas Watson, chairman of IBM 1943
- "Computers in the future will weigh no more than 1.5 tons." - Popular Mechanics, forecasting advance of science 1949
- "There is no reason why anyone would want to have a computer in their home" - Ken Olson, President, Chairman & Founder of Digital Equipment. Corp. 1972
- "If you want to make enemies, try to change something." -- Woodrow Wilson
- "Only I can change my life. No one can do it for me." – Carol Burnett
- "Change your thoughts and you change your world." -- Norman Vincent Peale
- "A person who never made a mistake never tried anything new." – Albert Einstein
- "Everything has beauty, but not everyone can see." – Confusious
- And, for Star Wars fans – "Do or do not. There is no try." - Yoda

Change

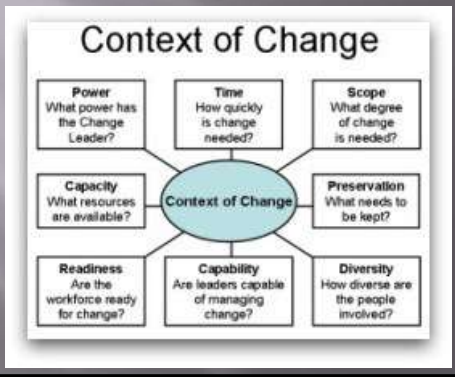
- What is Change? – Definition (Meriam Webster Dictionary):
- Etymology: Middle English, from Anglo-French *changer*, from Latin *cambiare* to exchange, probably of Celtic origin; akin to Old Irish *camm* crooked
- Date: 13th century
- *transitive verb* **1 a :** to make different in some particular **:** alter <never bothered to change the will> **b :** to make radically different **:** transform <can't change human nature> **c :** to give a different position, course, or direction to
  2 a : to replace with another <let's change the subject> **b :** to make a shift from one to another **:** switch <always changes sides in an argument> **c :** to exchange for an equivalent sum of money (as in smaller denominations or in a foreign currency) <change a 20-dollar bill> **d :** to undergo a modification of <foliage *changing* color> **e :** to put fresh clothes or covering on <change a bed>*intransitive verb* **1 :** to become different <her mood changes every hour>
  2 *of the moon* **:** to pass from one phase to another
  3 : to shift one's means of conveyance **:** transfer <on the bus trip he had to change twice>
  4 *of the voice* **:** to shift to lower register **:** break
  5 : to undergo transformation, transition, or substitution <winter *changed* to spring>

The Change Model

- Denial = try to resist and maintain the status quo
- Anger = upset with pending or occurring changes and thus emotional reactions
- Dejection = cannot have the old ways back and anger becomes remorse/despair/depression
- Acceptance = transition to more accepting perception, beginning to see situation for what it is and what it can be (more hopeful and positive)
- Learning and Development = change can finally be seen as positive and may actually improve the situation

123

Context of Change



What About Fear of Change?

- Change can be scary as it takes people out of their "comfort zone"
- Acknowledge and Accept that Change occurs – Does not mean you have to like it
- Look for ways to remain calm
- Assess the situation objectively
- Communicate personal needs and share feelings
- Be honest with yourself about what is happening
- Small steps to change – don't "bite off more than you can chew"
- Address resistance but don't push harder than one can manage – "Roll With Resistance" (Motivational Interviewing Technique)

What about Resistance to Change?

- Sometimes we need to ask for help – we can't do everything alone
- Look for information to help with decision making
- Nagging only pushes people away
- Enhance perception of control

128

129

Resistance…

- Can provoke negativity and even sabotage in some situations
- Feelings of loss, loneliness
- Feelings of indifference, confusion
- Feelings of anger, hostility
- Distance, isolation can be seen
- Disruptive behaviors, complaining

Strategies for Coping with Change

- Assess the situation carefully
- Think before acting
- Listen – Listen – Listen
- Ask questions of others and be willing to listen to the answers
- Trying to manage confusion – thus seek out information to help with decision making

Why Does Change Sometimes Fail?

- Unclear goal or vision
- Poor Communication
- Poor planning
- Poor motivation
- Change seen as a "management" issue only
- Too much focus on technical details and not enough focus on people issues
- No change in culture or the change process itself/never changes itself
- People do not feel a part of the change process
- People do not feel valued in the change process

Strategies for Coping with Change

- Assess the situation carefully
- Think before acting
- Listen – Listen – Listen
- Ask questions of others and be willing to listen to the answers
- Trying to manage confusion – thus seek out information to help with decision making
- Goal Setting
  - Realistic
  - Short Term vs. Long Term
  - Delegation in the workplace – everyone does their share and appropriate sharing of responsibility among participants
  - Don't make promises or commitments you can't keep

Strategies, cont…

- Adopt a positive attitude
- Surround yourself with positive motivators
- Rather than fear change, try to think of change as an opportunity for something new
- Keep sight of the long term vision
- Build up resilience
- Treat yourself well
- Sleep, eat, exercise, have some fun
- All work and no play…
- Take a break when feeling overwhelmed
- Build a support system and engage it
- Address spiritual needs as appropriate

Critical to the Change Process

- Look for people who know the situation, tools, and have the knowledge to help with the issues at hand – those who can serve as guides and mentors through the change process
- Web Site Reference: http://it.toolbox.com/blogs/enterprise-solutions/key-roles-in-change-acceptance-19358

Critical, cont…

- Those people (and leaders) making changes in a new setting must:
  - = assess readiness,
  - = choose a strategy,
  - = prepare a plan,
  - = develop a vision,
  - = seek and work with committed sponsorship,

Critical, cont…

= identify potential problems (resistance, risks, and barriers)
= provide open and regular communication,
= provide guidance and direction
= obtain the right resources
= promote teamwork and productive action
= motivate the target population
= monitor and evaluate the outcome

Stakeholder Mapping

Identify the key facilitators and obstacles involved

Resilience

Four Traits:

- Optimism – positive view, not effected by worry or negativity
- Engagement – actively involved
- Mobility – staying physically active
- Adaptability – ability to stay balanced by adapting to and accepting to change/loss

Acceptance

- The concept of acceptance is especially prominent in Eastern philosophy and religion, as well as in Christianity and other great religious systems. For example, in religious literature the spiritual principle of accepting the "suffering aspect" of life is described elegantly in the writings (various Books of the Bible) related to Christ's death. Acceptance is key to spiritual and emotional enlightenment and freedom (e.g., the Old Testament's *Book of Job).*

Acceptance

- Acceptance indicates that we address life as it is, not necessarily how we want it to be.
- Acceptance does not mean we have to like something – only that we accept things as they are
- With acceptance comes peace (resolution of conflict or dissonance) – in knowing that change must happen and must be accepted
- Acceptance = Non-Judgmental
- If you are judging, you have not engaged acceptance

Conflict

Etymology: Middle English, from Latin *conflictus* act of striking together, from *confligere* to strike together, from *com-* + *fligere* to strike — more at profligate

Date: 15th century

1 : fight, battle, war <an armed conflict>
2 a : competitive or opposing action of incompatibles **:** antagonistic state or action (as of divergent ideas, interests, or persons) **b :** mental struggle resulting from incompatible or opposing needs, drives, wishes, or external or internal demands
3 : the opposition of persons or forces that gives rise to the dramatic action in a drama or fiction

Types of Conflict

- Approach-Approach
- Approach-Avoidance
- Avoidance-Avoidance

- Approach = positive aspects/desirable
- Avoidance = negative aspects/undesirable

Lewin (1935), Allport (1948)

Addressing Conflict

- Accommodation = surrender personal needs to those of the other party
- Avoidance = ignore or postpone, change the subject, "buy time"
- Collaboration = work together to find mutual solutions
- Compromise = bring the problem into the open, each side gives up something to reach the middle; often a third party serves as intermediary
- Competition = assert your needs at the expense of the other; violent or non-violent means

Managing Conflict

- Stress Response Management Techniques
- Personal Outlets
- Enhanced Communication
- EAP Programs for staff/family
- Observant Managers, concerned coworkers
- "Don't blame the messenger"
- Think before you act

In Summary - Change:

With regard to change, be prepared to ask the following questions and see if the answers are worth the "cost" of change:

- What is going to be different with the change and/or after change(s) occurs? What do we gain? What do we lose?
- Why am I (we) doing this? How does this benefit me (us)?
- How will I know this has made a positive benefit?
- Who does this actually affect? How will they react?
- What are the risks to face? Costs?
- How do we manage everything so that change occurs, people are [happy], and benefit occurs?
- If things don't work out as expected, can we handle that, too?

End of Presentation

Thank you for your attention

147