The reign of pain lies mainly in the brain: Emerging concepts in neuropsychology

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Part One: Overview

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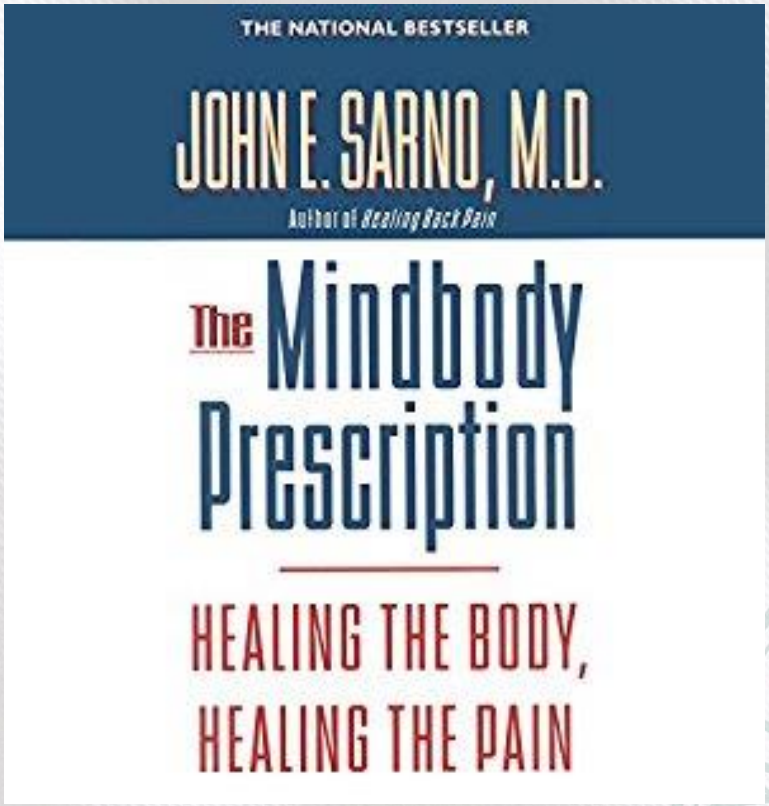

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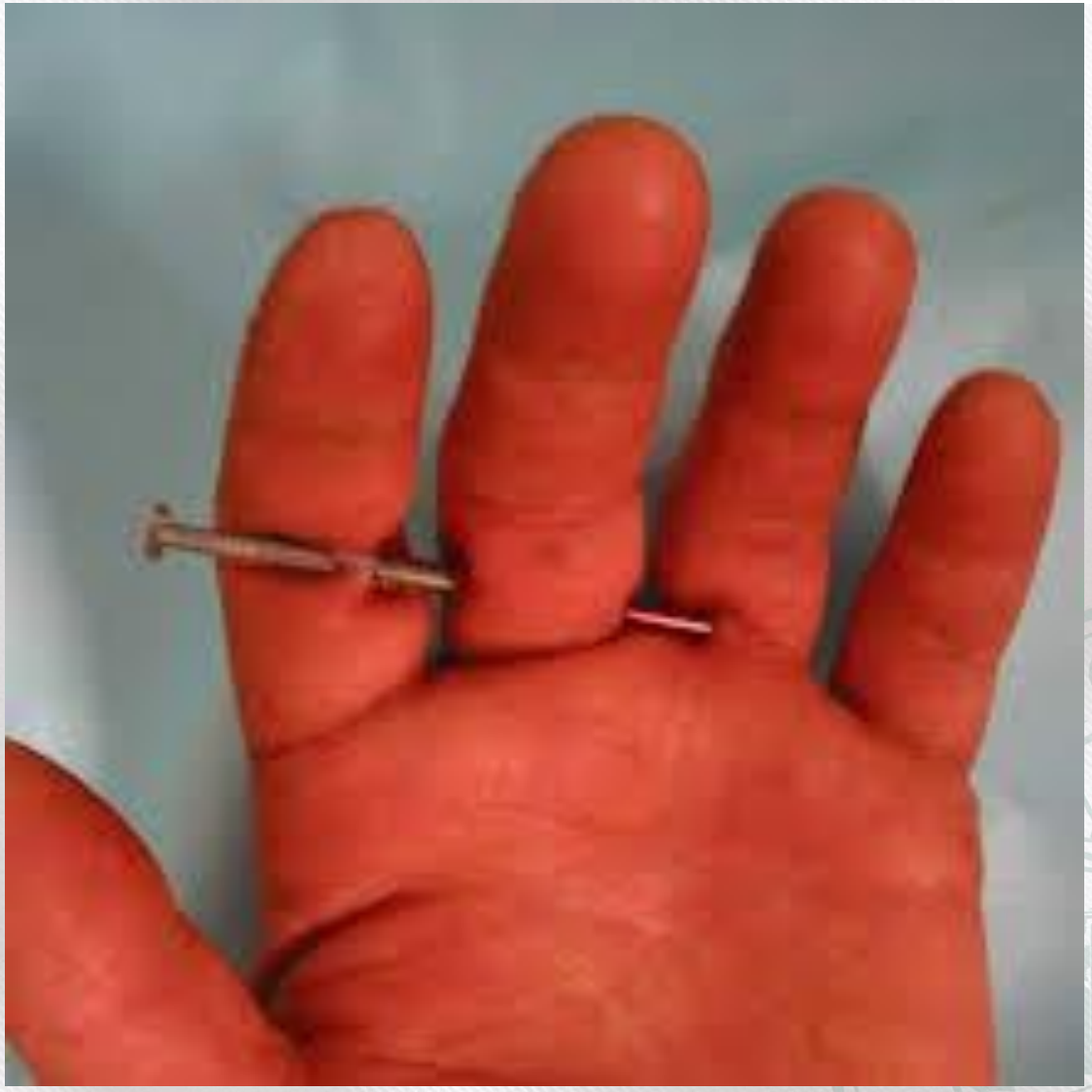

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Among people with NO back pain:

Age 30: 50% have DDD;
40% have bulging discs

Age 50: 80% with DDD;
60% have bulging discs


PARIS

Social rejection shares somatosensory representations with physical pain

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doi:10.1093/brain/awt211

BRAIN
A JOURNAL OF NEUROLOGY

Shape shifting pain: chronification of back pain shifts brain representation from nociceptive to emotional circuits

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Published in final edited form as:
Eur Arch Psychiatry Clin Neurosci. 2006 April ; 256(3): 174–186. doi:10.1007/s00406-005-0624-4.

The enduring effects of abuse and related adverse experiences in childhood:

A convergence of evidence from neurobiology and epidemiology

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To learn more:

Tmswiki.org

Part Two: Diagnosis of Psychophysiologic Disorders

Hidden in Plain Sight:

Meta-analysis of studies conducted in primary care offices:

40% and 49% of patients had at least one medically unexplained symptom

26-34% diagnosed with a somatoform disorder

(Haller, et. al., Deutsches Ärzteblatt International, 2015, 112, 279-287.)

Diseases that are likely PPD:

- GI: IBS, functional dyspepsia
- Musculo-skeletal: FM, MPS
- CNS: CFS, tension and migraine headaches, facial pain
- GU: IC, pelvic pain, vulvodynia
- ENT: TMJ
- Psychiatry: Anxiety, Depression, PTSD

These comprise a large proportion of primary care and specialty visits (40-60%)

Diseases that are NOT PPD

- **Oncology: Cancer**
- **Infections: HIV, Lyme disease, other infections**
- **CNS: Parkinson's disease, dementia, ALS**
- **ENT: Hearing loss, Meniere's disease**
- **Musculo-skeletal: Neurogenic findings of ruptured discs, arthritis causing significant limitations in movement**

Diseases that may have some component of PPD

- Rheumatology: SLE, RA
- CNS: MS
- ENT: Vertigo, dizziness
- Musculo-skeletal: Osteoarthritis
- GI: Crohn’s disease, UC

Diseases that are diagnosed as not PPD, but are often PPD

- CNS: Chronic fatigue syndrome, SEID
- Infections: Lyme disease, CMV, EBV
- Musculo-skeletal: Ehlers-Danlos syndrome, scoliosis
- GI: Chronic constipation

Almost any symptom can be caused by PPD

However, almost any symptom can also be caused by a structural disorder

Make each question, PE finding, and study work to help your distinguish

Diagnosing of PPD: Occam's Razor

- Details of injury and healing process
- Symptoms inconsistent—triggers, variability, anticipation
- PE not significant, not matching imaging
- PE yields non-structural or subjective findings
- Tests normal or within "normal aging"
- Rule out a structural disorder/rule in PPD

Diagnosing Psycho-Physiologic Disorders (PPD): Common patterns

- "I woke up with it"
- "It shifts from one spot to another"
- "It started here, but has now spread"
- The injury never healed, and gets worse over time
- "It was on one side and now it's on the other as well"
- "It went completely away when I was in _____"
- "My doctor's don't understand it" or "They told me it's X, Y, Z, etc."

Review of systems

For each of the following, check yes if you have had this symptom or condition and indicate the year it began; check again if it is still present.

	Yes?	Began when	Still present?
1. Heartburn, acid reflux	X	Childhood	yes
2. Ulcer symptoms or stomach pains	X	↓	
3. Hiatal hernia	X		
4. Irritable bowel syndrome	X		
5. Colitis, spastic colon		n	n
6. Tension headache	X	Childhood	
7. Migraine headache			
8. Eczema			
9. Anxiety symptoms and/or panic attacks	X	Childhood	n
10. Depression	X	Childhood	
11. Obsessive-compulsive thought patterns			
12. Eating disorders			
13. Insomnia or trouble sleeping	X		yes
14. Fibromyalgia	X	2005	yes
15. Bell's palsy, facial paralysis			
16. Back pain	X	1981	
17. Neck pain	X	1981	
18. Shoulder pain	X	1981	
19. Repetitive stress injury			
20. Reflex sympathetic dystrophy (RSD)			
21. Temporo-mandibular joint syndrome (TMJ)	X	Teens	
22. Chronic tendonitis			
23. Carpal tunnel syndrome			
24. Trigeminal neuralgia, facial pain			
25. Numbness, paresthesias			
26. Fatigue or Chronic fatigue syndrome			
27. Palpitations	X	Teens	
28. Chest pain			
29. Hyperventilation	X	Teens	
30. Spastic bladder			
31. Interstitial cystitis			
32. Prostate problems			
33. Pelvic pain			
34. Muscle tenderness	X	2005	
35. Tachycardia or low blood pressure	X		
36. Tinnitus			
37. Dizziness			
38. Other symptoms (please list)			

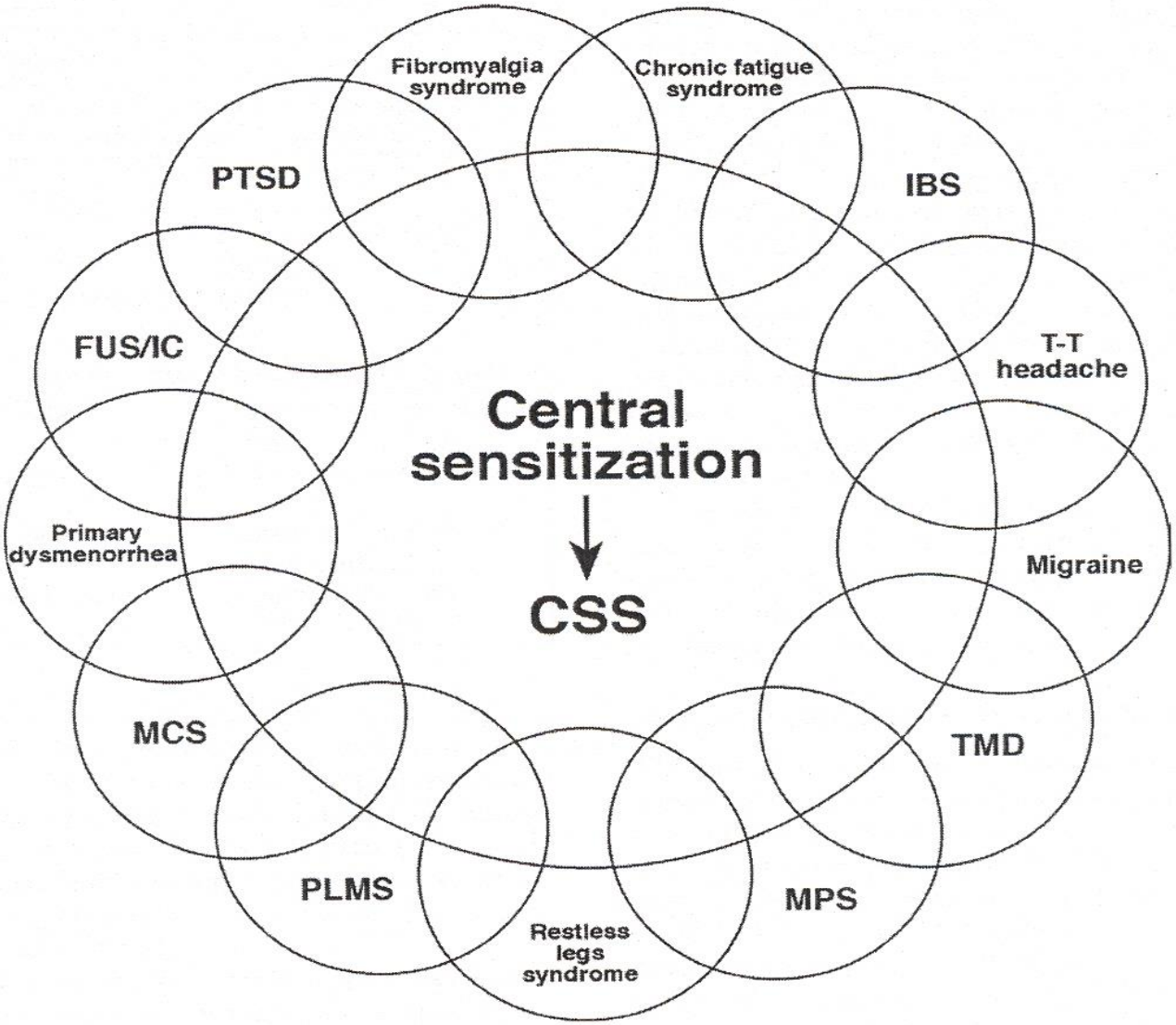


Figure 1 Currently proposed members of the CSS family with overlapping relationships and a common pathophysiological link of CS. IBS, irritable bowel syndrome; T-T headache, tension-type headache; TMD, temporomandibular disorders; MPS, myofascial pain syndrome; RSTPS, regional soft-tissue pain syndrome; PLMS, periodic limb movements in sleep; MCS, multiple chemical sensitivity; FUS, female urethral syndrome; IC, interstitial cystitis; PTSD, posttraumatic stress disorder. Depression may also be a member (see text). Modified from reference 198.

Have you had any traumatic or violent experiences in childhood? Yes/(No)

Please explain

What words would you use to describe your father?

Cruel - hard working - generous - confident - intelligent - stubborn - appreciative - sad - lonely - determined

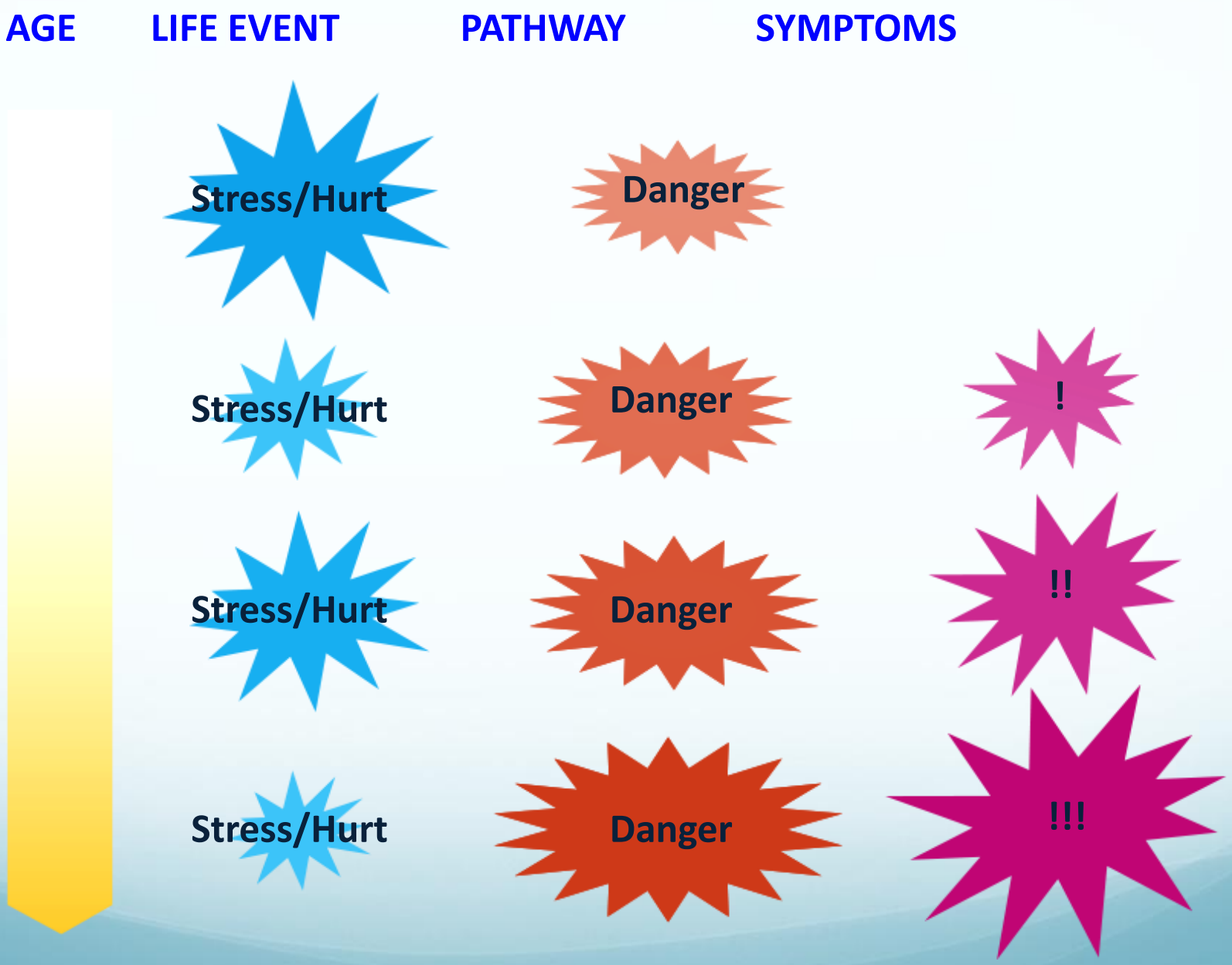
What words would you use to describe your mother?

passive - loving - hard worker - depressed - tired
ALZHEIMERS

History of stressors

Please **make a check** which of the following occurred around the time your symptoms (Sx) began **or** has occurred recently or is currently present:

	Occurred when Sx began	Recent or Current
1. Illness or death in your family or friends		X
2. Divorce or marital problems	X	
3. Legal problems		
4. Accident or injury		
5. New relationship or marriage	X	
6. Difficulties at work or change in job or business	X	
7. Gain of a new family member or change in the family structure		
8. Change in financial situation	X	
9. Change in living situation	X	
10. Violent experiences		
11. Changes in sexual functioning or other issues regarding sex		


AGE
LIFE EVENT
PATHWAY
SYMPTOMS
Stress/Hurt
Danger
Stress/Hurt
Danger
!
Stress/Hurt
Danger
!!
Stress/Hurt
Danger
!!!

35 year old man with bilateral hand pain for 3 years, now incapacitated, no diagnosis despite seeing several specialists

52 year old woman with daily headache for 37 years, has been to several headache specialists, treated with over 20 medications, to no avail

House or Osler?

Diagnosing PPD:

- Does the disorder/symptoms fall into PPD likely category?
- Do the symptoms fit for a neural pathway disorder (variability, timing, distribution)?
- Does the PE and testing rule out a structural disease?
- Does the person have other PPD diagnoses?
- Were there early life priming events?
- Do emotions/stress correlate with onset and exacerbations?

Clues to the diagnosis of PPD:

- Occurrence of a significant number of PPDs in the past (Review of Symptoms lifetime checklist)
- History of adverse childhood events (ACE scale)
- Personality traits of self-criticism, self-sacrificing, perfectionism, need to please, and others (personality traits checklist)
- Onset of symptoms coincide with significant stressful life events (life trajectory interview)
- Symptoms are in a distribution pattern inconsistent with a structural disorder, such as symmetric or one whole side of the body, or the whole arm or leg

Clues to the diagnosis of PPD 2:

- Symptoms have persisted after normal healing would have occurred
- Symptoms shift from one location in the body to others
- Symptoms spread from one area to adjacent regions
- Symptoms are bilateral in distribution
- Symptoms occur due to social contagion
- Symptoms vary with time of day, place, or activity in discernible patterns
- Symptoms are correlated with stressful situations or the anticipation of stressful situations, such as family visits or work stress

Clues to the diagnosis of PPD 3:

- Physical exam does not reveal clear objective signs of pathology; no evidence of injury and a normal neurological examination
- Light palpation elicits significant symptoms or results in unusual radiation of symptoms
- Lab studies and imaging reveal normal or “normative” findings, such as degenerative disc disease or bulging discs frequently found in patients without pain
- Symptoms are triggered in the office when discussing stressful events, alleviated when exposed to emotion-focussed exercises

Part Three:
New Research findings

Research Paper

PAIN®

Emotional awareness and expression therapy, cognitive behavioral therapy, and education for fibromyalgia: a cluster-randomized controlled trial

Mark A. Lumley[a,*], Howard Schubiner[b], Nancy A. Lockhart[a], Kelley M. Kidwell[c], Steven E. Harte[d,e], Daniel J. Clauw[d,e,f], David A. Williams[d,e,f,g]

Multi-site RCT for Fibromyalgia

- NIH-funded, 2-site, 3-arm, allegiance-controlled RCT (Wayne State University; University of Michigan, Providence Hosp.)
- Patients: n = 230 (94% female, M = 49 years old); 8 sessions, 90-min, once per week, small group
- Assessments: Baseline, post-treatment, and 6-month follow-up

Lumley, Schubiner, et al., submitted

Psychological therapies for chronic pain

Often directed at the consequences of pain, not cause of pain, diagnostic ambiguity

Often directed towards thoughts and behaviors, rather than emotions

Geared to function rather than pain itself

How many studies have shown one psychological therapy to be superior to another for pain?

Allegiance-controlled Treatments

- Emotional Awareness and Expression Therapy (Mark Lumley, PhD & Howard Schubiner, MD)
- Cognitive-behavioral therapy for FM (Dave Williams, PhD)
- FM Education (control) (Dan Clauw, MD & Nancy Lockhart, MSN)
- Different set of 3 therapists for each; skilled in and committed to that model

Emotional Awareness and Expression Therapy

- **Brain – emotion-(reversible) symptom model**
  - Symptom-stress life review
  - Developing comfort with anger and its expression
  - Sharing private experiences (secrets)
  - Experiential expression exercises (repeated)
  - Developing intimacy and connection with others
    - **Touch, praise, gratitude, forgiveness**
  - Learning to honestly confront troubled relationships
  - Homework: WED, daily recordings, relationship exercises

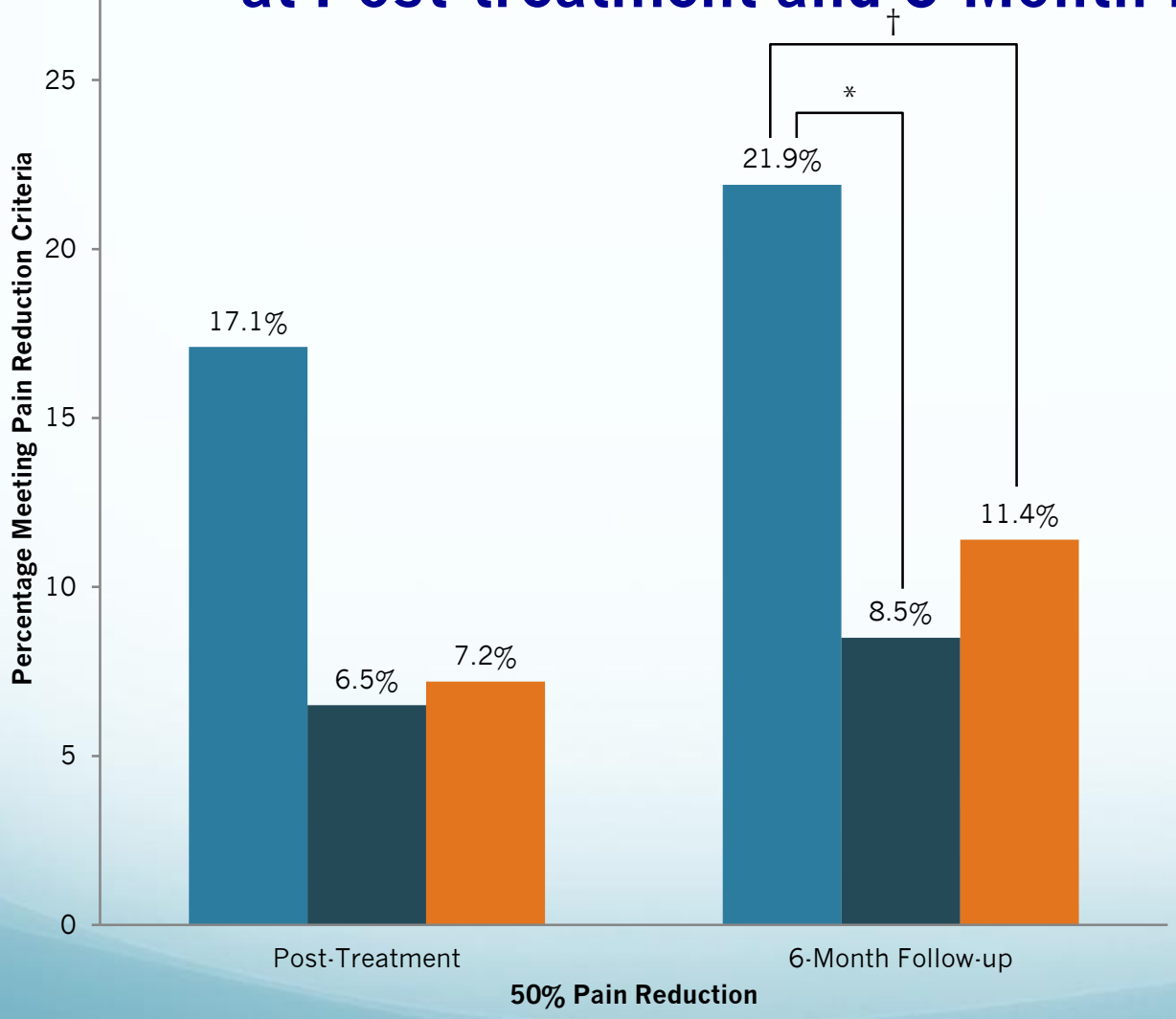
Cognitive-Behavioral Therapy

- Skill-based symptom management and lifestyle modification
  - Self-assessment: self-monitoring
  - Fatigue: time-based pacing
  - Pain: relaxation and problem solving
  - Sleep: behavioral sleep modification, goal setting
  - Mood: pleasant activity scheduling
  - Dyscognition: memory boosters, cognitive reappraisal
  - Functional status: combining skills
  - Homework: practice skills each week

FM Education (Control)

- Knowledge about FM increases power, decreases uncertainty, and reduces defensiveness
  - Provision of relevant information about FM in supportive group context
  - Fibromyalgia: definitions and diagnoses
  - Pain: physiology and assessment
  - Central sensitization syndromes
  - Medications for FM
  - Complementary and alternative FM treatments
  - Using the internet
  - Research methods in FM studies

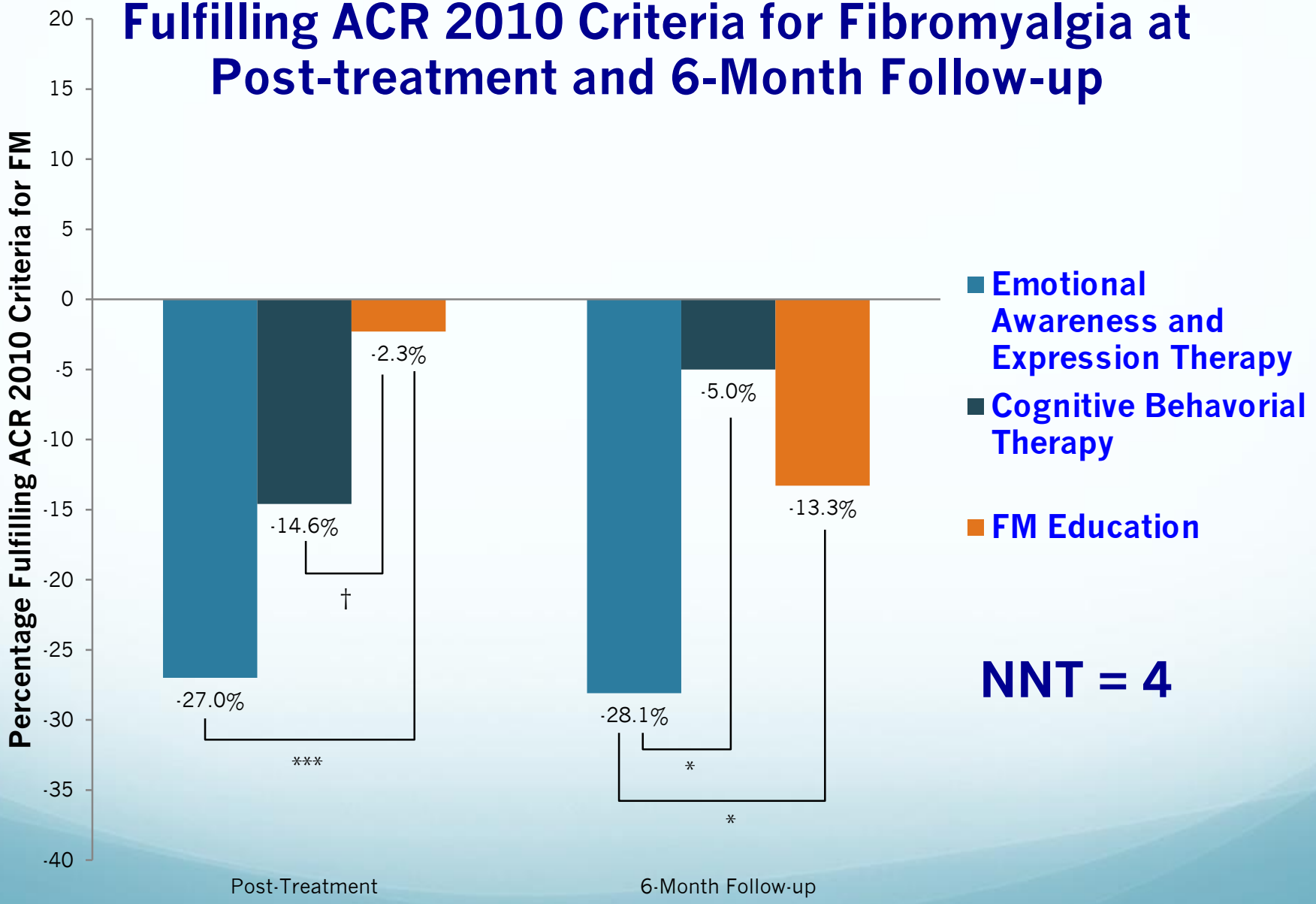
Percentage of Patients in Each Treatment with 50% Pain Reduction (BPI) from Pre-treatment at Post-treatment and 6-Month Follow-up



- Emotional Awareness and Expression Therapy
- Cognitive Behavorial Therapy
- FM Education

NNT = 7

Percentage of Patients in Each Treatment Fulfilling ACR 2010 Criteria for Fibromyalgia at Post-treatment and 6-Month Follow-up



NNT = 4

EAET: What we have learned

Many patients, especially those with central pain, have unresolved trauma, relational problems, conflicts

Pain is connected to emotions

Patients usually need help processing their emotions

Experiencing and expressing avoided adaptive, primary emotions reduces symptoms

--Some people have major improvements

EAET is superior to CBT for significant pain reduction

Part Four: Treatment Overview

Great Rx for the Few Who “Get It”

What patients need to “get”

- Your symptoms are real, but they will not harm you
- Your brain has been sensitized and is creating symptoms
- Symptoms are due to neural pathways
- Most people have this, at least to some degree
- This is not your fault
- You can get better

PPD Interventions

- Education
- Behavioral interventions
- Psychotherapy
- Emotional interventions
- Life changes

I am 21 months post-op (3rd back surgery, a 3-level fusion this time. 21 months spent trying every therapy in the book, anything and everything to get out of enormous unrelenting back pain. [On top of 22 years of constant chronic limiting back pain.] With no success.....
My doctor sent me the link to your website 6 days ago; I went to it the next day; *considered* the possibility that yes, maybe this could apply to me.....came back a day later to read all the material more seriously and realized: absolutely, this describes me to a "T.'' With that shift in belief the back pain subsided-----almost like "poof!"-----it went from like a 7 to a 1 on the pain scale, to off the pain scale onto a "discomfort" scale. I believe this was totally due to the complete shift in my belief system---no half way for me.....a total realization: this is me.

Then, another BIG change: Once I got it that there is nothing structurally wrong with my back, on the 4th day, I started walking. I could barely walk around the building, but I kept up a steady mantra of "I can walk." And there I was taking a pleasant walk around the complex.

Forgive me for being effusive here but WOW!----- what a day-and-night difference ---- from crippled, fearful, bewildered, discouraged, bordering on despairing------to “on my way”--to regaining my life.

Cognitive and behavioral techniques:

- Reduce fear in relation to symptoms
- Be more assertive and challenge triggers to symptoms
- Practice outcome independence by paying less attention to symptoms while reengaging in activities
- Practice mindful awareness of thoughts and feelings
- Learn to identify emotions as they arise, especially when connected to symptom onset or exacerbation

Cognitive and behavioral techniques 2:

- Practice giving compassion to self and to oneself at earlier ages
- Perform expressive writing exercises
- Take action in life to stand up for oneself and create self-fulfillment
- Work on forgiveness for self and others
- Engage more fully in life, work, exercise, play, and awe

“I had a huge success today. I was in quite a bit of pain but super determined to walk in the neighborhood. I said to my subconscious mind: "I am walking today despite the pain. You can make it easy for me or you can make it difficult. But I am doing it!" I walked about a half an hour and my pain lessened considerably. This was a huge breakthrough for me and means the program is working! I am astonished. I cannot believe it.”

Emotion focussed techniques:

- Access emotions on a regular basis
- Search for emotions when symptoms arise
- Memory reconsolidation techniques
- Compassion training for present and past
- Expressive writing
- ISTDP
- Share secrets in safe settings

Changes in one's life

Current life situations can add greatly to stress and undermine PPD recovery

Dealing with the emotions is critical

Accepting unalterable situations with grace is necessary

Setting boundaries often required

Acting to change things is empowering when possible

Serenity prayer as a guide

Compassion: A key ingredient for the patient and for the provider

Be patient; don't expect patients to understand this; it's hard to get; they are in real pain; their lives have been painful.

Please don't add to stigma.

"The true basis of the good bed-side manner is a large heart."

Peabody F. JAMA 1892, 18: 203-204

One suggestion is to work on self-compassion. The little girl who was you was hurt and you can help to heal yourself by working on providing love and understanding to that little girl. Pay a visit to her, write to her, talk to her with kindness and caring; cry with her. Let her know that you're there for her and that she deserved better.

Yes, self-compassion makes total sense. Not being cared for by others as a kid is something that can never be undone, but the way I treat myself can be altered, and shall be. I was stuck in a kind of learned helplessness for a long time without even realizing it. I see the protective function of the MBS very clearly now, actually it seems like an attempt to get cared for like I had never been, at the price of one's health and well-being. I think there's a lot of anxiety waiting to break free. But I'm getting better all the time :-).
It's almost unbelievable that a health issue of this magnitude isn't picked up by the medical community at large.

Yesterday I did the first writing exercise, with tears streaming down my face at times, to find that my anxiety comes from a whole different place than I thought it did. When I was finished, my whole body was screaming with pain, like saying, no, you can't stand facing that, I have to prevent that all costs. And I wrote a letter to my brain replying that, yes, I can face it, I want to and I'm capable of doing it, and today the pain is all but gone. A few days ago I had to stand for hours without the possibility of sitting down, something I haven't been able to do for many years on account of the vicious back pain, and it was perfectly all right! This made me so proud and happy.

Psychophysiologic Disorders

- Stress and unresolved emotions create real, physical pain via neural pathways
- No disease process in the body, i.e., physiological, but not pathological changes
- Symptoms are a message created by subconscious processes
- Pain and other symptoms can persist for years due to learned neural pathways
- Reversal of mind body symptoms can occur by cognitive, behavioral and affective interventions

“Working in the field of pain management for many years, I was aware that chronic pain could occur from traumatic experiences. But we didn’t know how to use that knowledge. We could only offer support and help them cope with their pain when medications and injections were only partially helpful. Since I have understood that the mind commonly generates pain and learned how to recognize that process, I realize that the majority of my patients have a psycho-physiologic disorder and that many of them can recover.” --Joel Konikow, MD, Swedish Hospital Pain Center, Seattle