

# Foundations of Pain Management

## BioPsychoSocial Issues

**MiCCSI**

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# Disclosures

- Consultant to Community Health Focus Inc.
- President of the American Pain Society
- Funded for research by NIH

There will be no use of off-label medications in this presentation.

# People have mixed reactions to learning about the Biopsychosocial influence on pain



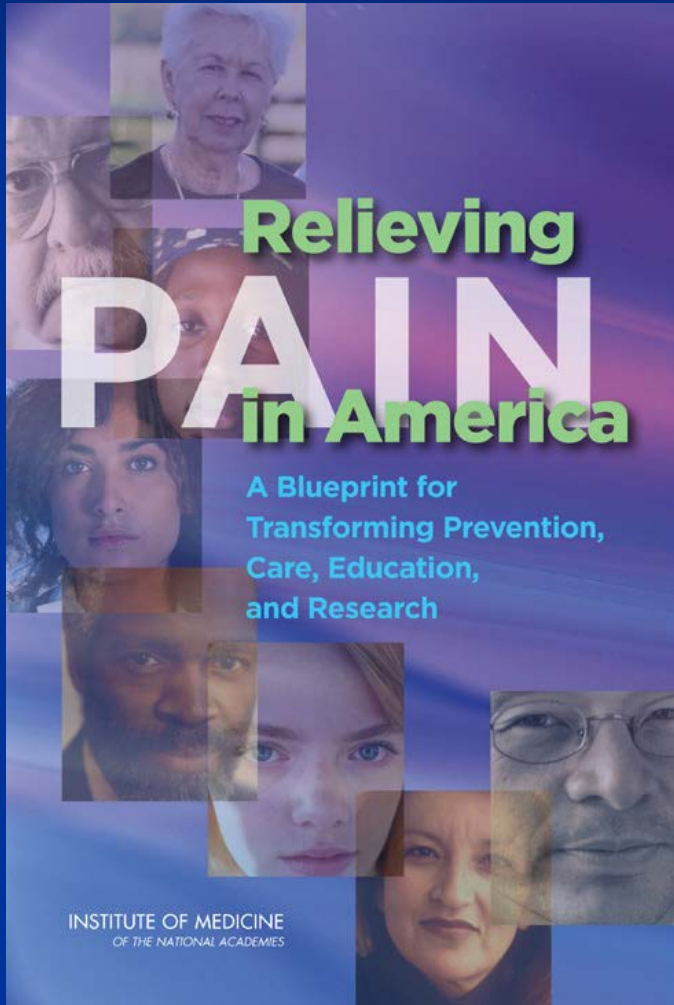
I assume he's going to tell me about

- Depression
- Anxiety
- Personality Disorders
- Addiction
- Problem patients



This is the really important stuff

# 100 Million Individuals in the U.S. have Chronic Pain



**Relieving  
PAIN  
in America**

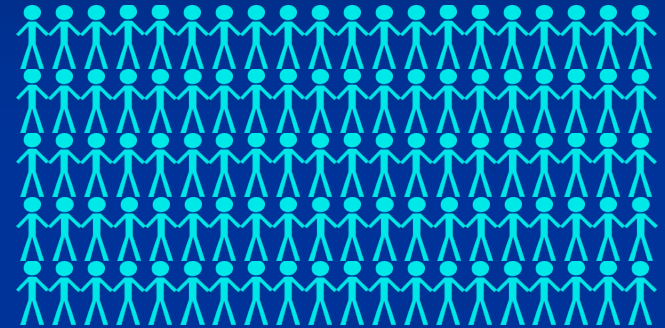
A Blueprint for  
Transforming Prevention,  
Care, Education,  
and Research

INSTITUTE OF MEDICINE  
OF THE NATIONAL ACADEMIES



# More people have Chronic Pain than Diabetes, Heart Disease, and Cancer Combined

Chronic Pain 100 Million



Diabetes 29.1 Million



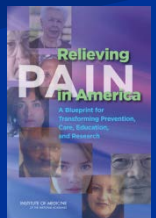
Heart Disease 27.6 Million



Cancer 13.7 Million



 = 1 Million individuals





# Most Pain Care Visits occur within Primary Care



Peterson K, et al.. VA ESP Project #09-199; 2017.

# Pain Medicine Versus Pain Management: Ethical Dilemmas Created by Contemporary Medicine and Business

*John D. Loeser, MD\*† and Alex Cahana, MD, PhD\*†*

**Biomedical Model**  
**Interventional**  
**Pain Medicine**

- **Procedure Driven**
- **Focus on curing/fixing**

**Patient is passive recipient**

**Biopsychosocial model**  
**Interdisciplinary**  
**Pain Management**

- **Focus on multidisciplinary teams**
- **Focus on pain management**

**Patient is active participant**

# How good is our black bag for treating chronic pain?



Treatment	Impact on Chronic Pain
Long term opioids	32% reduction
Pain drugs generally (across classes)	30% - 40% get 40% - 50% relief
Spinal fusion	75% still have pain
Repair herniated disk	70% still have pain
Repeat Surgery	66% still have pain
Spinal cord stimulators	61% still in pain after 4 yrs. average pain relief 18% across studies



## Facet blocks: Limited evidence

Slipman CW, Bhat AL, Gilchrist RV, Isaac Z, Chou L, Lenrow DA. A critical review of the evidence for the use of zygapophysial injections and radiofrequency denervation in the treatment of low back pain. *Spine J.* 2003; 3:310-316.

Carette S, Marcoux S, Truchon R, et al. A controlled trial of corticosteroid injections into facet joints for chronic low back pain. *N Eng J Med.* 1991; 325:1002-1007.

## Biomedical Model Generally: Limited evidence

Chou R, Loeser JD, Owens DK, et al. Interventional therapies, surgery, and interdisciplinary rehabilitation for low back pain: an evidenced-based clinical practice guideline from the American Pain Society. *Spine.* 2009; 34:1066-1077.

Hogan QH, Abram SE. Neural blockade for diagnosis and prognosis: a review. *Anesthes.* 1997; 86:216-241.

Merrill DG. Hoffman's glasses: evidenced-base medicine and the search for quality in the literature on pain medicine. *Reg Anesth Pain Med.* 2003; 28:547-560.

Staal JB, de Bie RA, de Vet HCW, Hildebrandt J, Nelemans P. Injection therapy for subacute and chronic low back pain: an updated Cochrane review. *Spine.* 2009; 34:49-59.

## Epidural steroid injections: Limited evidence

Armon C, Argoff CE, Samuels J, Backonja M. Assessment: use of epidural injections to treat radicular lumbosacral pain: report of the Therapeutics and Technology Assessment Subcommittee of the American Academy of Neurology. *Neurology.* 2007; 68:723-729.

Bowman SJ, Wedderburn L, Whaley A, Grahame R, Newman S. Outcome assessment after epidural corticosteroid injection for low back pain and sciatica. *Spine.* 1993; 18:1345-1350.

Carette S, Leclaire R, Marcoux S, et al. Epidural corticosteroid injections for sciatica due to herniated nucleus pulposus. *N Eng J Med.* 1997; 336:1634-1640.

Koes BW, Scholten RJPM, Mens JMA, Bouter LM. Efficacy of epidural steroid injections for low-back pain and sciatica: a systematic review of randomized clinical trials. *Pain.* 1995; 63:279-288.

# If Patients don't respond to the BioMedical model...

- They must be crazy
- The pain is all in their heads
- They don't want to get better

# If Patients don't respond to the BioMedical model...

- They must be crazy
- The pain is all in their heads
- They don't want to get better

## **OR perhaps**

- We don't fully understand pain
- Treatment of pain requires a different approach than the traditional biomedical model
- Effective pain treatment requires a different financial model

# Thinking Differently about Pain

- Chronic pain is not just extended acute pain

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- Nociception is NOT pain





# Thinking Differently about Pain

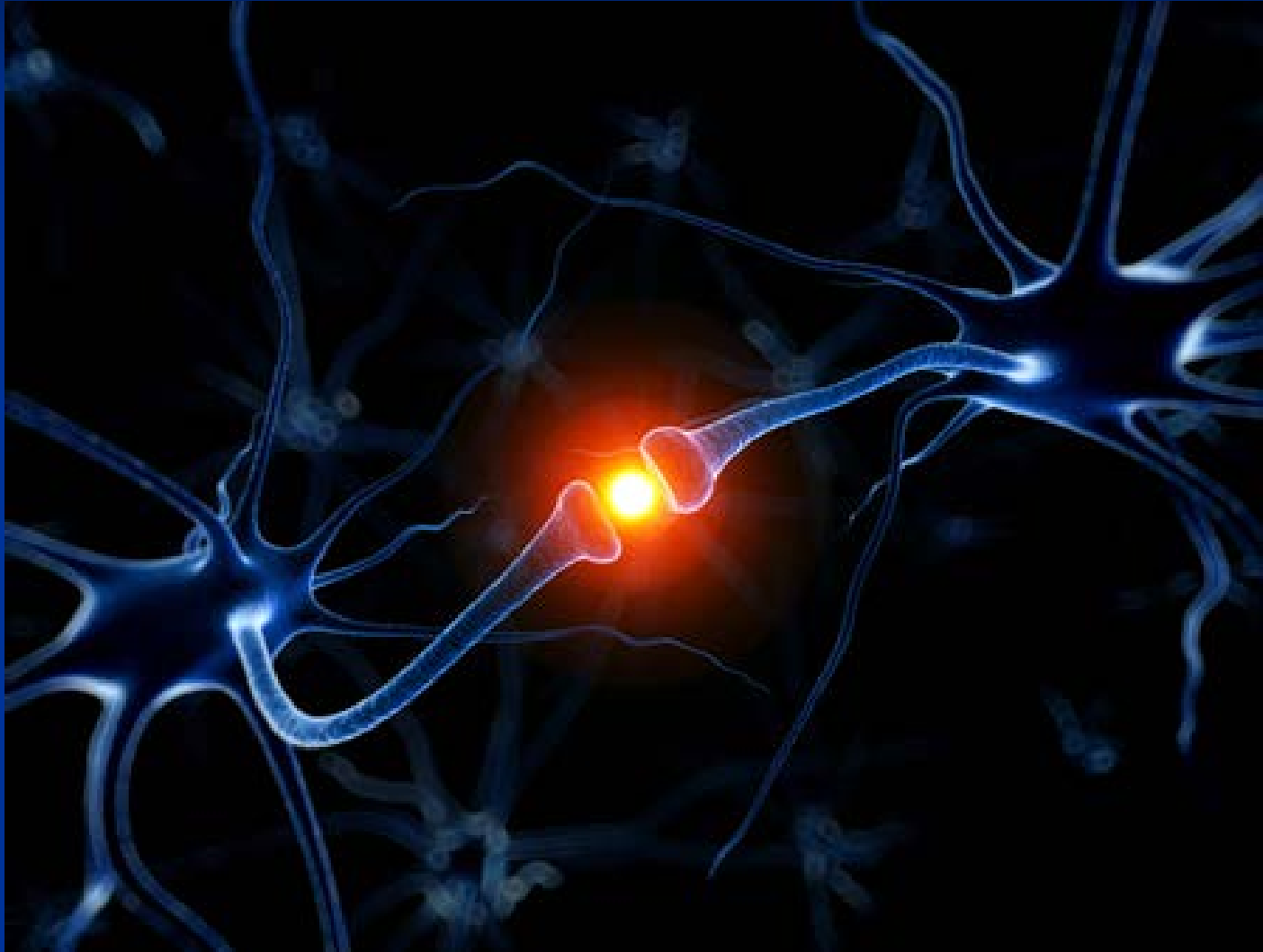
- Chronic pain is not just extended acute pain
- Nociception is NOT pain

- Pain is an experience

- Much like hunger
- The experience is not equivalent to the biological processes
- Fixing the identified biology won't fix the perceptual process or the perception itself
- You have to “fix” the whole experience



**Nociception is just a neural signal**  
**Nociception needs context to become pain**

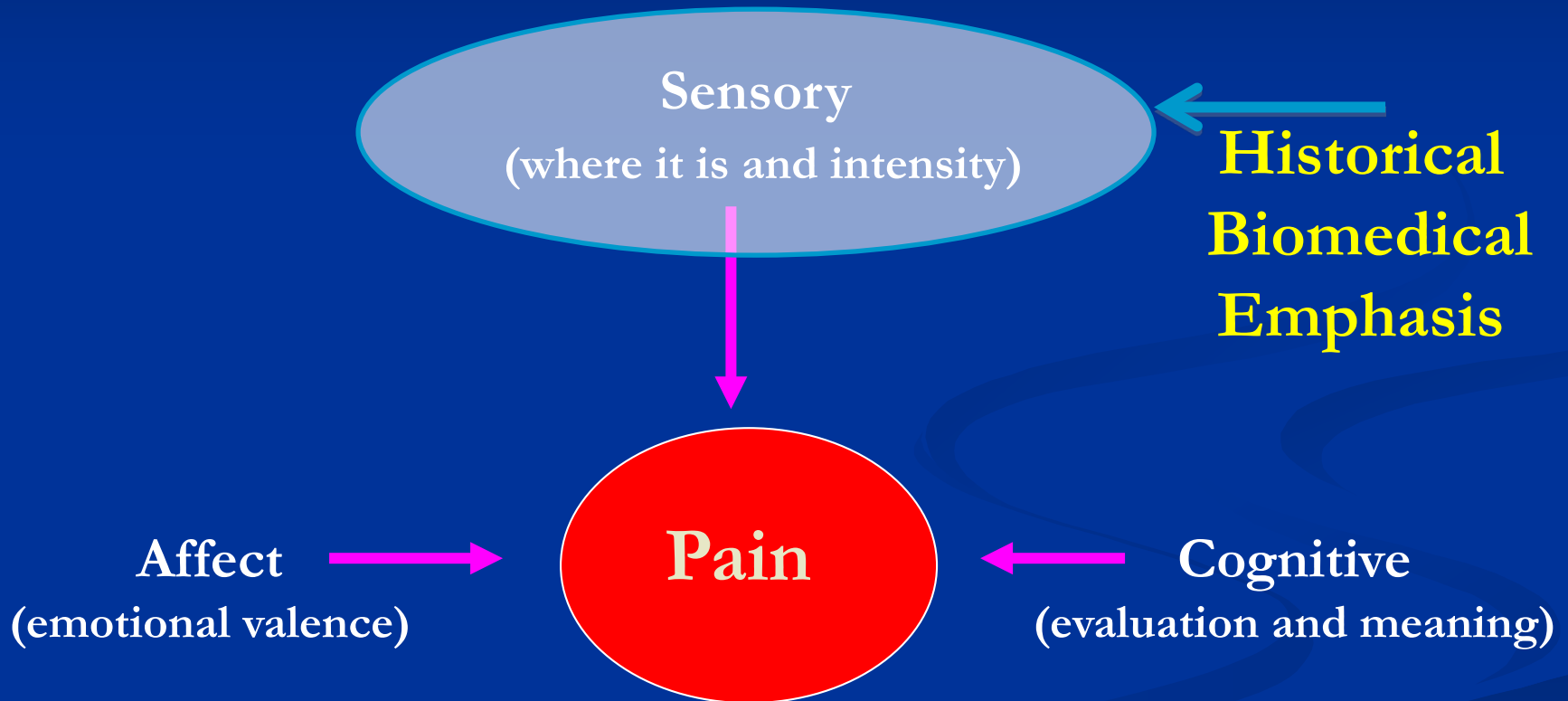








# Chronic Pain has Three Components: The BioMedical Model addresses 1 of them





# Neurobiological perspective

**Brain regions** associated with pain processing involve both sensory and affective/cognitive regions

- **Sensory / discriminative dimension**
  - Somatosensory cortices (S1, S2)
  - Dorsal posterior insula
- **Affective / Cognitive dimensions**
  - Anterior insula
  - Prefrontal cortex
  - Anterior cingulate cortex
  - Thalamus
  - Amygdala
  - Hippocampus



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I still feel  
pain



# Chronic Pain

- Similar in mechanism to an emotion but experienced as a bodily sensation



# CNS Neurotransmitters

## Influencing Pain

### Facilitation

Gabapentinoids,  
ketamine

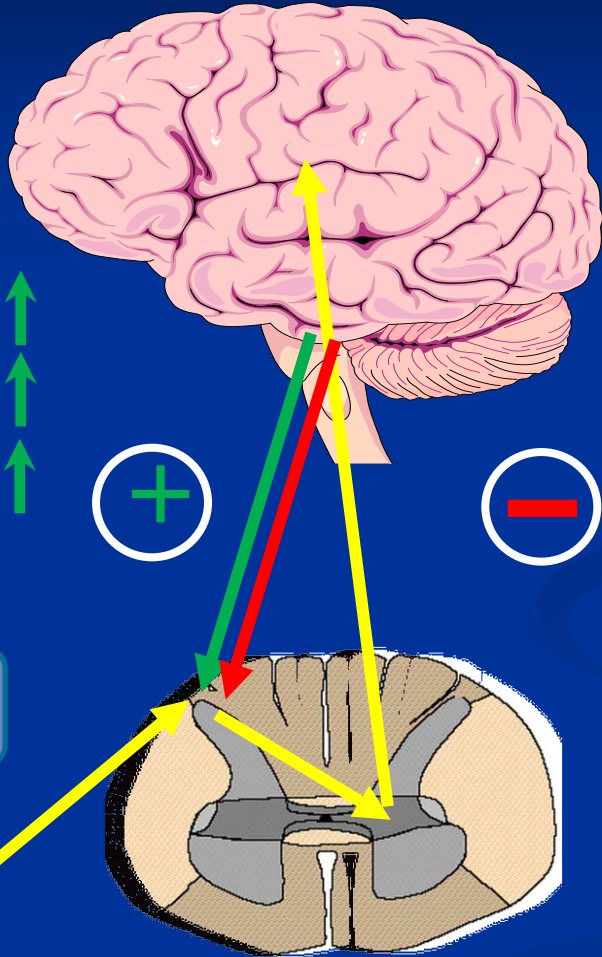
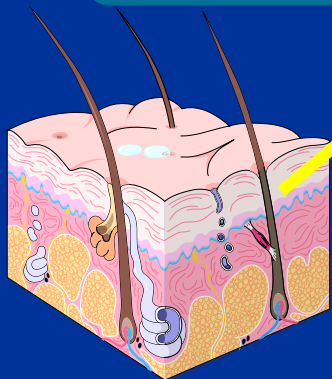
Glutamate and EAA

Substance P

Nerve growth factor

Serotonin  
(5HT<sub>2a, 3a</sub>)

Anti-migraine drugs (-  
triptans),  
cyclobenzaprine



### Inhibition

Descending anti-nociceptive pathways

Norepinephrine-serotonin (5HT<sub>1a,b</sub>),  
dopamine

Tricyclics, SNRIs,  
tramadol

Opioids

Low dose naltrexone

Cannabinoids

No knowledge of endocannabinoid activity but this class of drugs is effective

GABA

Gammahydroxybutyrate,  
moderate alcohol  
consumption

- Schmidt-Wilcke T, Clauw DJ. *Nat Rev Rheumatol*. Jul 19 2011.
- Clauw DJ. *JAMA*. 2014.



# Neurotransmitters for Pain Processing

## Norepinephrine

Concentration

Circadian rhythms

Attention

Stress

Energy

# Neurotransmitters for Pain Processing

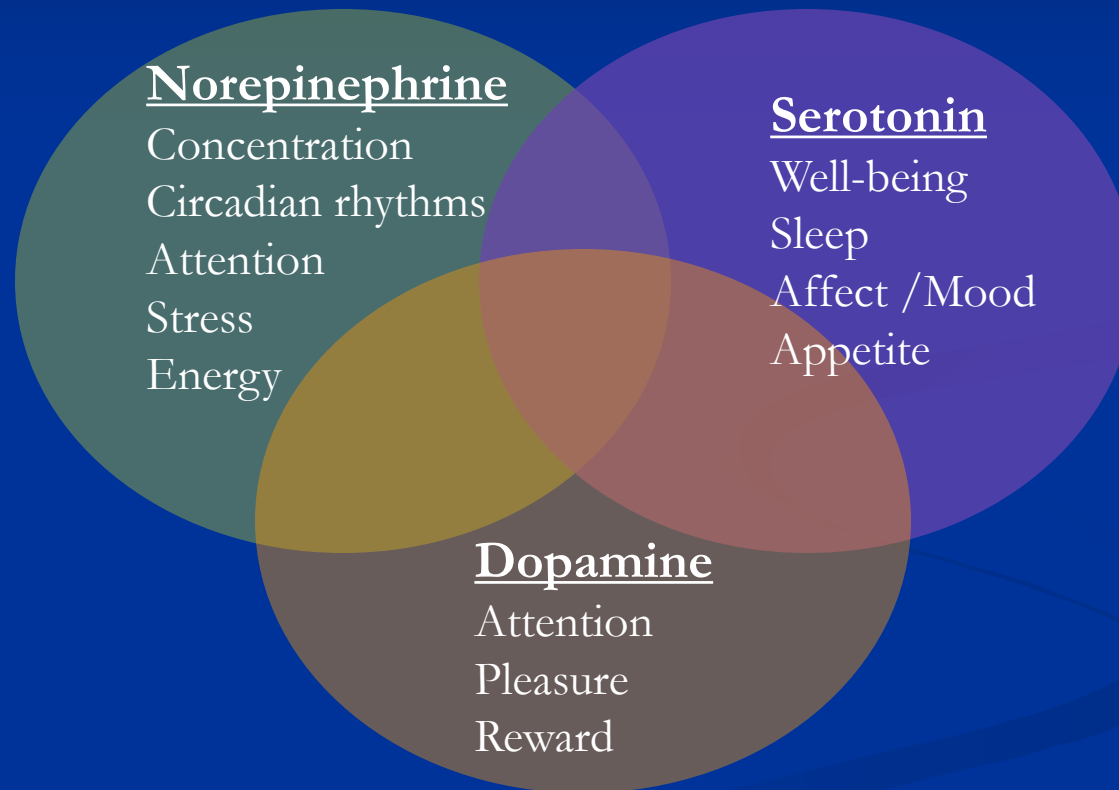
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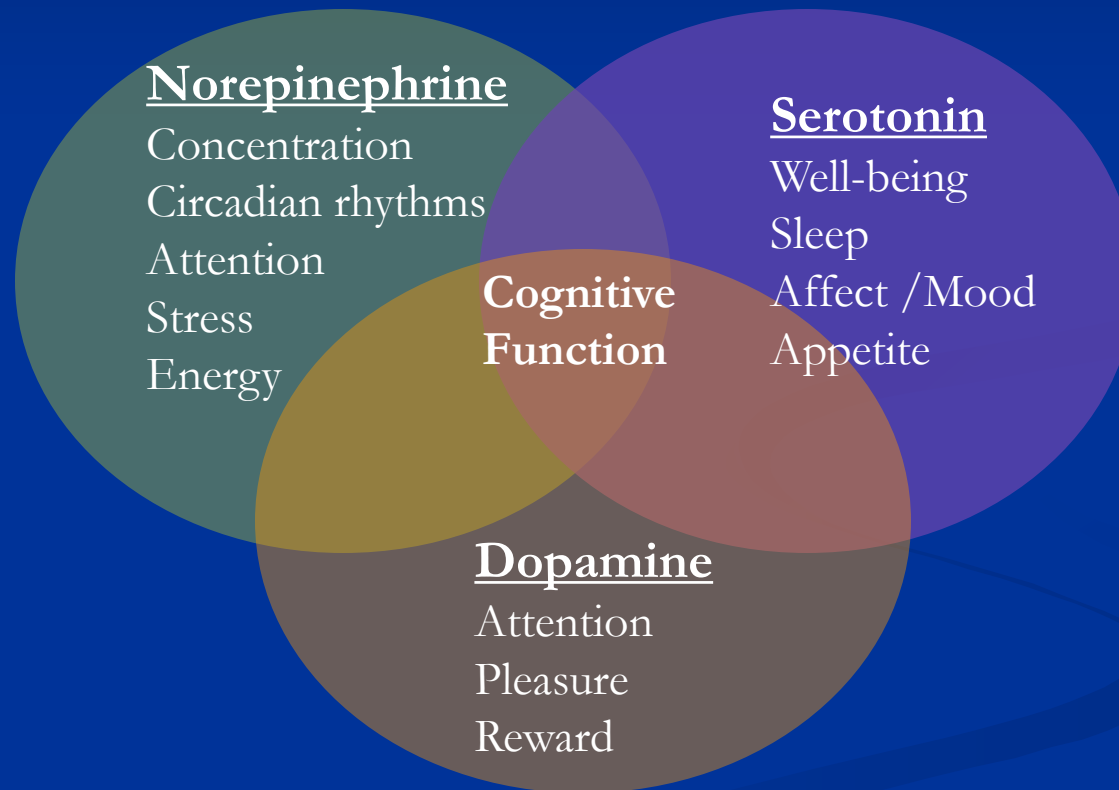
## Serotonin

Well-being  
Sleep  
Affect /Mood  
Appetite

# Neurotransmitters for Pain Processing



# Neurotransmitters for Pain Processing



# Neurotransmitters for Pain Processing

## Glutamine

Major Exciter of CNS, Synaptogenesis and neurogenesis

## Norepinephrine

Concentration  
Circadian rhythms  
Attention  
Stress  
Energy

## Serotonin

Well-being  
Sleep  
Affect /Mood  
Appetite

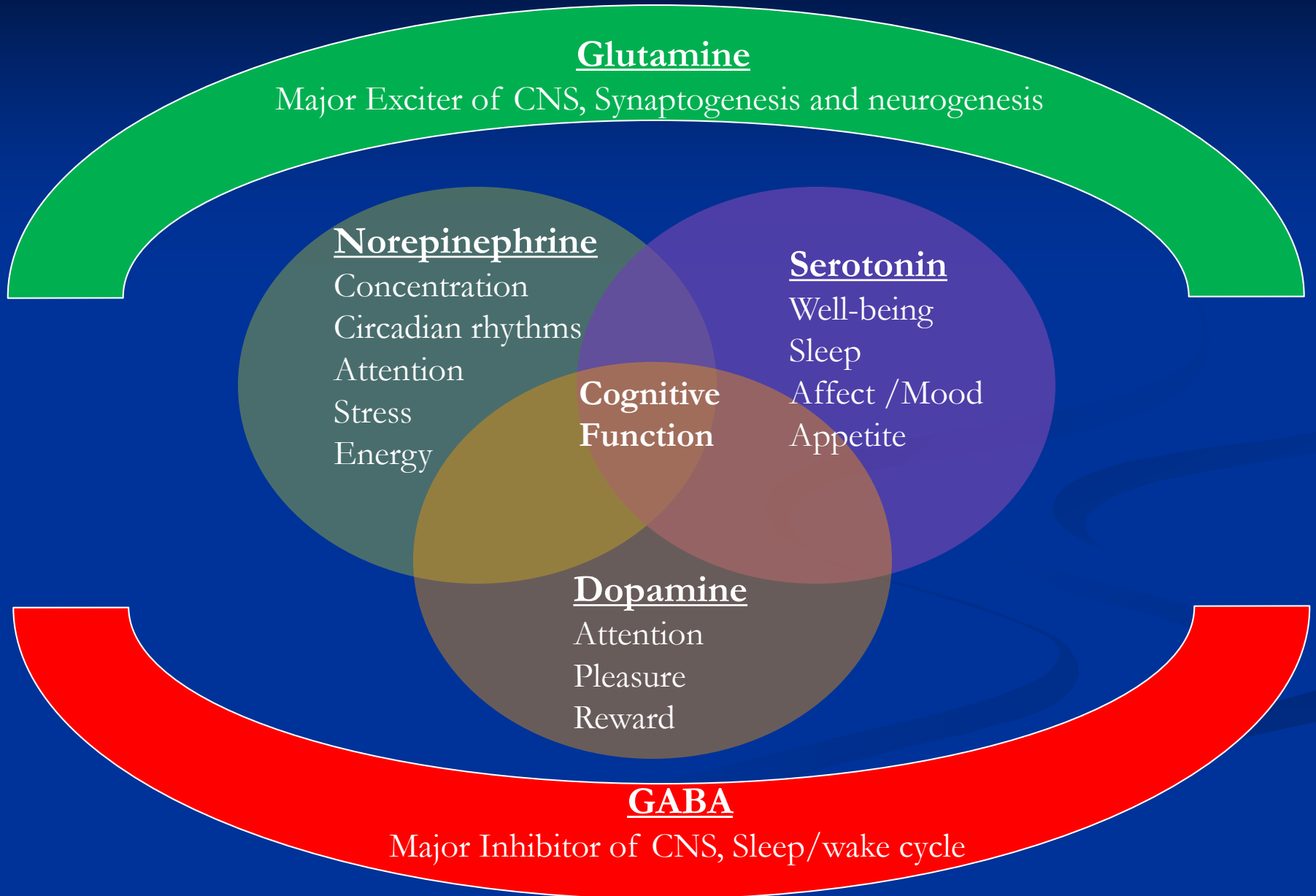
## Cognitive Function

## Dopamine

Attention  
Pleasure  
Reward



# Neurotransmitters for Pain Processing



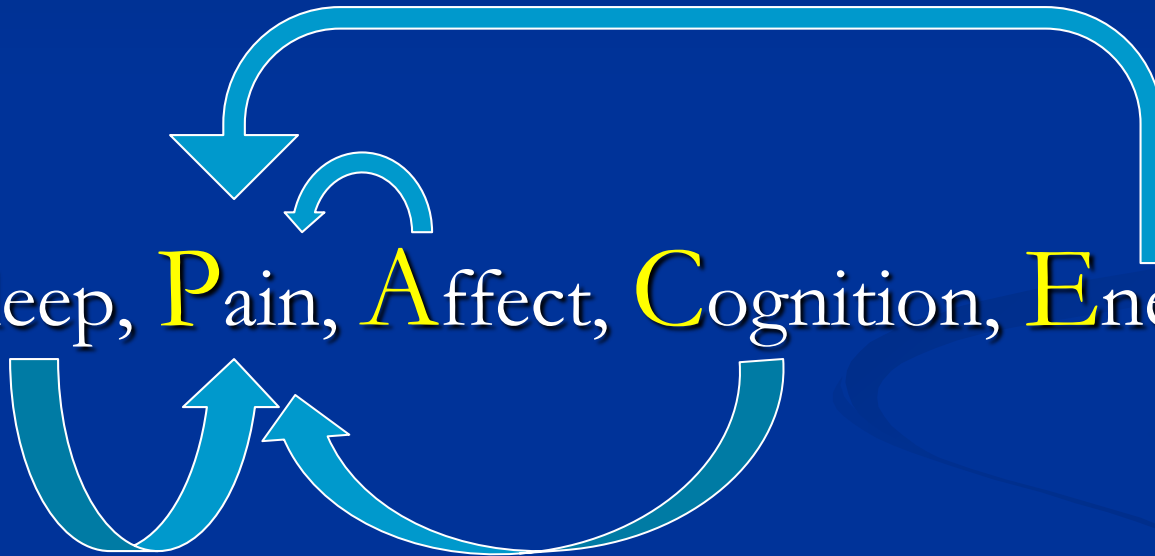
# Shared Neurotransmitters Explain

- The complexity of chronic pain presentation

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- The complexity of chronic pain presentation

■ Sleep, Pain, Affect, Cognition, Energy



# Shared Neurotransmitters Explain

- The complexity of chronic pain presentation
- By considering associated symptomatology, Clinicians have more targets upon which to intervene.

# How is Pain Classified?

Time	Body Location	Suspected Etiology
Acute Vs Chronic	Head, Neck, Back, Pelvis	Cancer, Rheumatic, etc.

## Newest Classification: Pain Mechanisms

Adaptive Pain <sup>1,2</sup>	Pain as Disease State <sup>3,4</sup>
<ul style="list-style-type: none"> <li><input type="checkbox"/> Alert to Danger <b>Nociceptive Pain</b></li>   <li><input type="checkbox"/> Facilitate immobility / healing <b>Inflammatory Pain</b></li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Damage to the nervous system <b>Neuropathic Pain</b></li>   <li><input type="checkbox"/> Augmented central pain processing <b>Central Pain</b></li> </ul>

<sup>1</sup>Woolf CJ. *J Clin Invest.* 2010;120(11):3742-3744. <sup>2</sup>Costigan M, et al. *Annu Rev Neurosci.* 2009;32:1-32. <sup>3</sup>Dickinson BD, et al. *Pain Med.* 2010;11:1635-1653. <sup>4</sup>Williams DA, Clauw DJ. *J Pain.* 2009;10(8):777-791.



# A Closer Look at Central Pain

Pain

Pain



Pain

Pain

# Chronic Overlapping Pain Conditions

<b>COPCs</b>	<b>US Prevalence</b>
<b>Irritable Bowel Syndrome</b>	<b>44 Million</b>
<b>Temporomandibular Disorder</b>	<b>35 Million</b>
<b>Chronic Low Back Pain</b>	<b>20 Million</b>
<b>Interstitial Cystitis / Bladder Pain Syndrome</b>	<b>8 Million</b>
<b>Migraine Headache</b>	<b>7 Million</b>
<b>Tension Headache</b>	<b>7 Million</b>
<b>Endometriosis</b>	<b>6 Million</b>
<b>Vulvodynia</b>	<b>6 Million</b>
<b>Fibromyalgia</b>	<b>6 Million</b>
<b>Myalgic Encephalopathy / CFS</b>	<b>4 Million</b>

<sup>1</sup>Veasley, C. et al (2015). White paper from the *Chronic Pain Research Alliance*.

# Central Sensitization

## Clinical Assessment:

- Pain disproportionate to nature and extent of injury (not nociceptive)
- Not due to lesions or damage within CNS (not neuropathic)
- Wide-spread pain distribution
- General hypersensitivity of senses, stress, emotions, mental load,
- S.P.A.C.E.



# Action of Non-Pharmacological Interventions across COPC's

- Interventions that are successful at desensitizing or calming CNS activity associated with central sensitization are likely to be beneficial across conditions
- Interventions that diminish “central load” are likely to be helpful over time. It takes time to calm (reset) a sensitized CNS.

# So what's a doctor to do?






# Dually Focused Management of Chronic Pain

## Symptoms of Pain, Fatigue, etc.

- Nociceptive processes (damage or inflammation of tissues)
- Disordered sensory processing

**Pharmacological therapies to improve symptoms**



## Functional Consequences of Symptoms

- Increased Distress
- Decreased activity
- Isolation
- Poor sleep
- Maladaptive illness behaviors

**Nonpharmacological therapies to address dysfunction**



# Non-Pharmacological Therapies for Chronic Pain States

## Strong Evidence

- Education
- Aerobic exercise
- Cognitive behavior therapy

## Modest Evidence

- Strength training
- Hypnotherapy, biofeedback, balneotherapy

## Weak Evidence

- Acupuncture, chiropractic, manual and massage therapy, electrotherapy, ultrasound

## No Evidence

- Tender (trigger) point injections, flexibility exercise

# How to ERASE S.P.A.C.E.

Exercise & Energy

Reframing & Relaxation

Affect & Action

Sleep & Social

Education



Sleep, Pain, Affect, Cognitive changes, Energy deficits

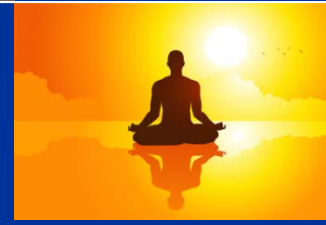
# Topics in Psychosocial Pain Interventions

Exercise/Energy, Reframing/Relaxation, Affect/Action, Sleep/Social, Education (ERASE)

E



R



A



S



E



## Exercise and Energy

- Multiple reviews and meta-analyses, and professional society guidelines recommend exercise and physical activity for the treatment of chronic pain and fatigue
- Increase Fitness
- Increase Function

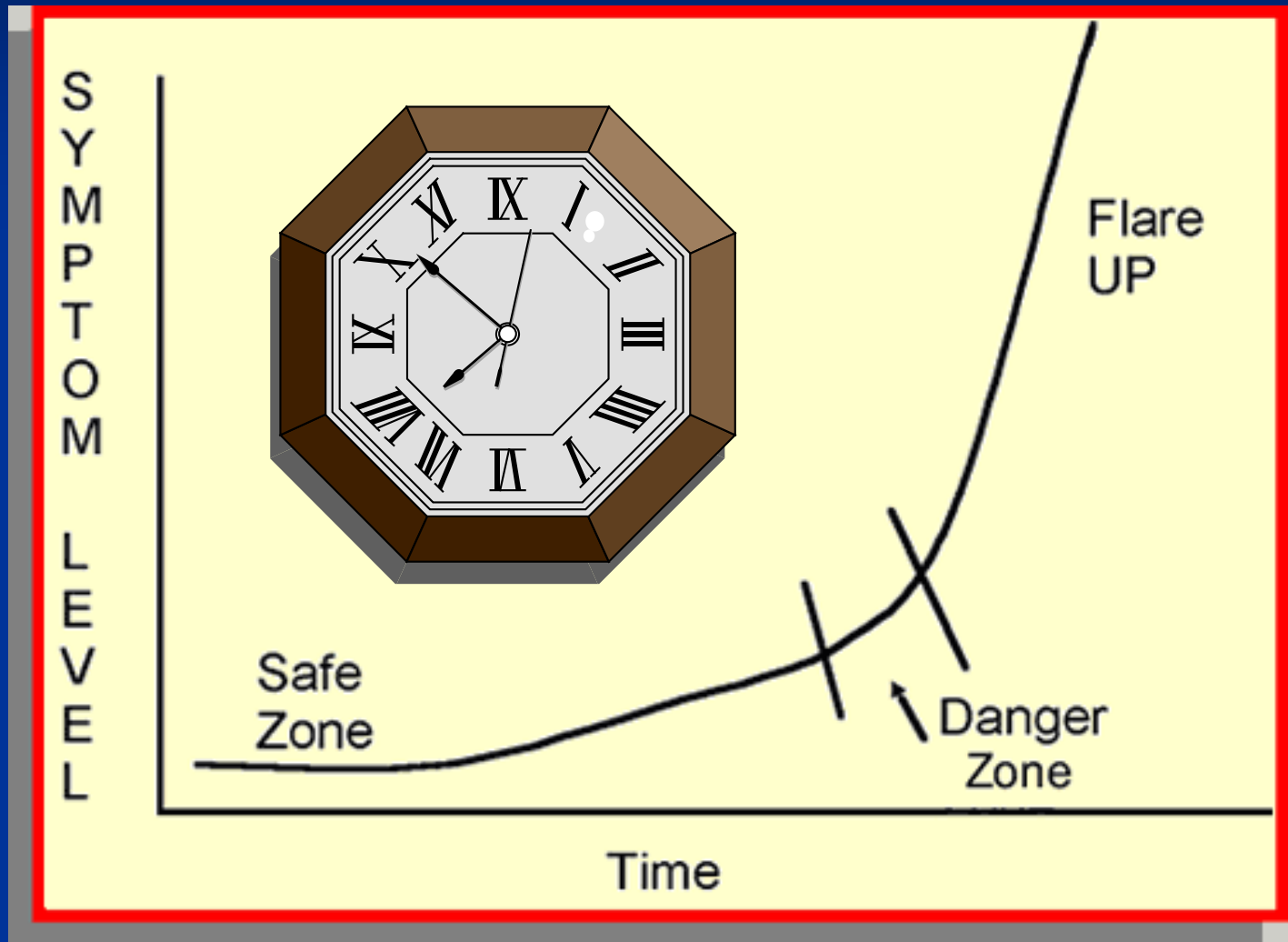


# Lifestyle Physical Activity



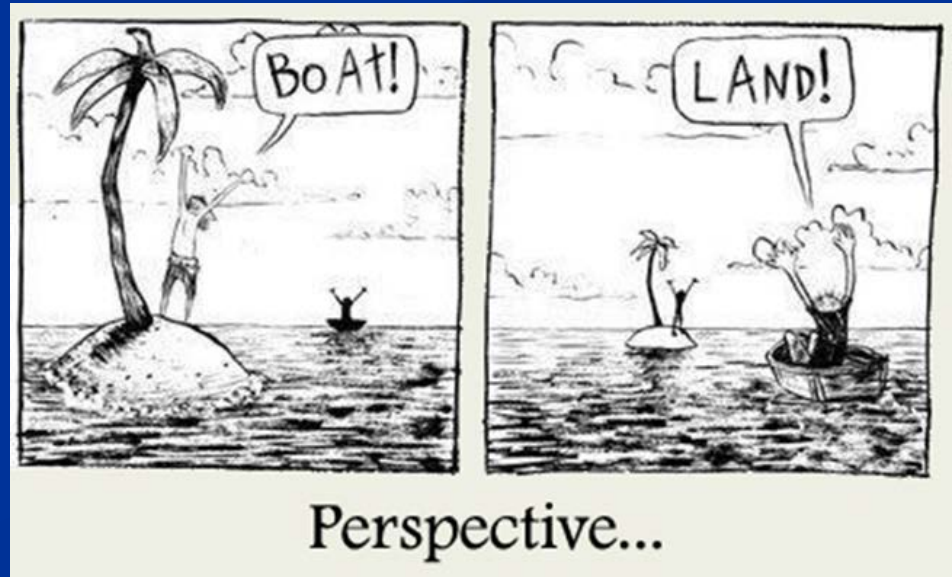



# Behavioral Time-Based Pacing





## Reframing





# If Novel Learning is Negative, Automatic Thinking becomes Negative

## Acute pain is awful

- Feels better with rest, avoiding tasks, withdraw socially
- Prepares self for the worst
- Catastrophizing – produces negative emotions



## When pain becomes chronic

- Tendency to retain acute pain thinking
- Don't revisit assumptions about pain
- Physiological toll - deconditioning
- Need to focus on challenging old assumptions



## The Relaxation Response



ERASE

# AFFECT





# Psychiatric Co-Morbidities



# Psychiatric Co-Morbidity in Chronic Pain

	<u>Depression</u>	<u>Anxiety</u>
<b>General Population:</b>	6.6%	18.1%
<b>Chronic Pain:</b>	30-54%	



# Personality Disorders in Chronic Pain Patients

## Personality Disorders

gen. pop: 5%-15%

chronic pain: 51%-58%

### Cluster A:

#### Odd/Eccentric

- \*Paranoid
- \*Schizoid
- Schizotypal

44%

### Cluster B

#### Emotional/Erratic

- Antisocial
- \*Histrionic
- Narcissistic
- Borderline

31%

### Cluster C

#### Anxious/Fearful

- Avoidant
- \*Dependent
- OCPD

25%

## Personality Disorders

Predictive of transition from acute to chronic status

Sub clinical P.D. impacts pain and treatment compliance

**Patients do not need  
to be mentally ill to  
have chronic pain**



# Approaches to Resolve Negative Affect Influencing Chronic Pain



Emotional Awareness and  
Expression Therapy (EAET)



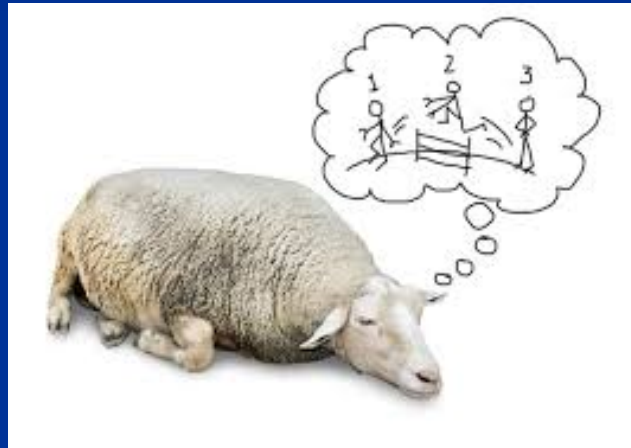
Pleasant Activity Scheduling



Traditional Psychotherapy

ERASE

# Sleep



## Social Challenges



Dr. -Patient



Friends



Family



Employer and co-workers

ERASE

# Education





# Web-based self-management "FibroGuide"

**FibroGuide**

Home  
About FibroGuide  
Getting started  
Steps for me  
FibroGuide modules  
About us

**FibroGuide Modules**

Exit Program

**FibroGuide Menu** MINIMIZE

Tell Me How FibroGuide Works | Steps for Me

STEPS

- Understanding Fibromyalgia
- Communicating
- Being Active
- Sleep
- Relaxation
- What is Fibro Fog?
- Setting Goals
- Pacing Yourself
- Thinking Differently
- Time for You

Color Key: Step My Steps Visited Step

Back Forward

Use the FibroGuide menu to navigate the program. Once you make a selection, the menu will minimize to the bottom of your screen. You can always access it by clicking on the arrow in the upper corner of the menu.

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**FibroGuide**

Home  
About FibroGuide  
Getting started  
Steps for me  
FibroGuide modules  
About us

**Pacing Yourself**

Feeling well and doing too much  
Have you ever done too much when you felt well and then "paid for it" later? If so, you may have fallen into a frustrating cycle in which you overdo it and then feel worse, which then causes you to have more pain and fatigue. Overexerting yourself can cause a flare-up, which is a term that is used to describe a transient appearance or worsening in symptoms such as feeling muscle and joint pain, feeling tired, or having trouble getting the right kind of sleep.

When you get caught up in this catch-up/flare-up cycle, you may:

- Feel well and do too much
- Have a flare-up
- Fall behind in tasks while you rest and recover
- Repeat the cycle when you feel well again

Many people with fibromyalgia may find it easier to fall into this catch-up/flare-up cycle because tasks, like household chores, that used to be quick and simple may now take longer to complete. This can make it hard to accomplish everything that you need to do each day. As a result, you may feel the need to make up for bad days by playing catch-up on good days.

Do more by pacing yourself  
Learning how to pace yourself can help you break this catch-up/flare-up cycle. Pacing

Page 1 of 4

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**Inside This Step:**

- Feeling well and doing too much
- It's time to pace yourself
- Put it into practice
- A note for family and friends

**Added Features:**

- Pacing Yourself Work Sheet
- Expert Advice
- Download this Step

Test Size Break Notice On

<http://fibroguide.med.umich.edu/>

# Intervening in the PCP Encounter

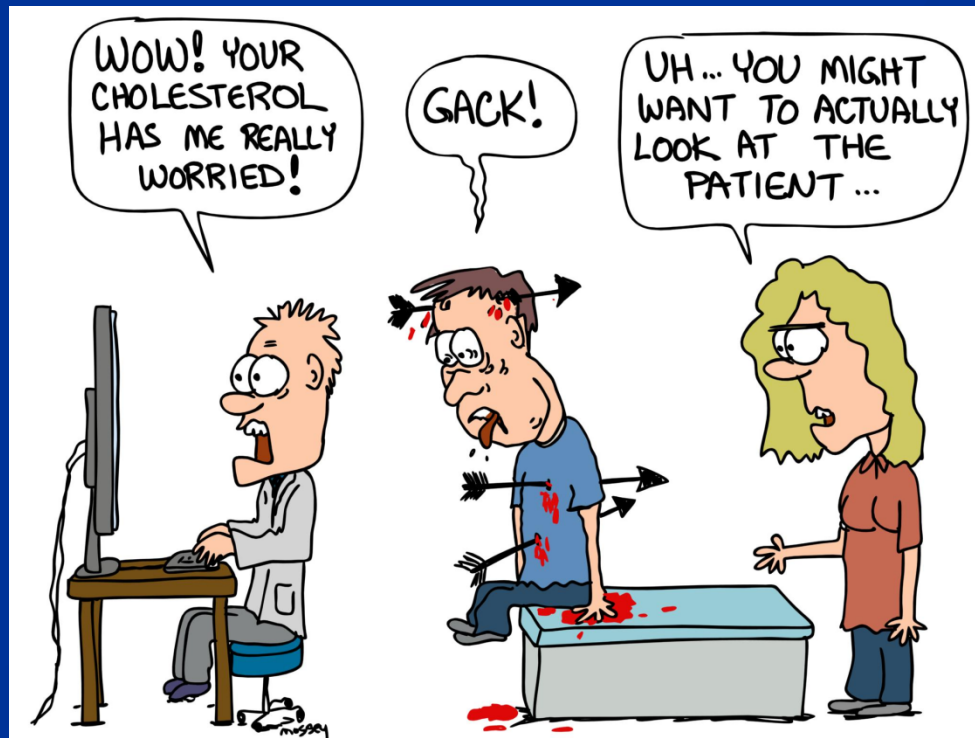








## Where's the patient?





**HARVARD**  
MEDICAL SCHOOL

## Are we losing touch — literal touch — in the doctor-patient relationship?

Sacha Pfeiffer August 18, 2014

<https://hms.harvard.edu/news/>

The New York Times

HEALTH

## Are Doctors Losing Touch With Hands-On Medicine?

By ABIGAIL ZUGER JULY 13, 1999

The New York Times

HEALTH | CASES

## Not on the Doctor's Checklist, but Touch Matters

DANIELLE OFRI and M.D. AUG. 2, 2010

**KHN**  
KAISER HEALTH NEWS

## Patients Lose When Doctors Can't Do Good Physical Exams

By Sandra G. Boodman | May 20, 2014

*This KHN story was produced in collaboration with **The Washington Post***

By MARLYS HARRIS / MONEYWATCH / May 2, 2011, 12:20 PM

## Are Doctors Losing Their Touch?

Comment / Share / Tweet / Stumble / Email

*Last Updated May 13, 2011 1:07 PM EDT*





AP / Tony Dejak



# Three things you can Practice Tomorrow

- 1. Maximize the power of touch through physical exam
- 2. You don't always need to have a psychologist deliver emotional support to patients. Just listen to the story. You will be treating the affective and social components of pain.
- 3. If you recommend self-management (exercise, relaxation, sleep hygiene etc.), ask about it with the same enthusiasm and regularity that you ask about drugs. Patients learn what you think is really important by what you ask about.