Foundations of Pain Management: BioPsychoSocial Issues

Mi-CCSI

David A. Williams, Ph.D.

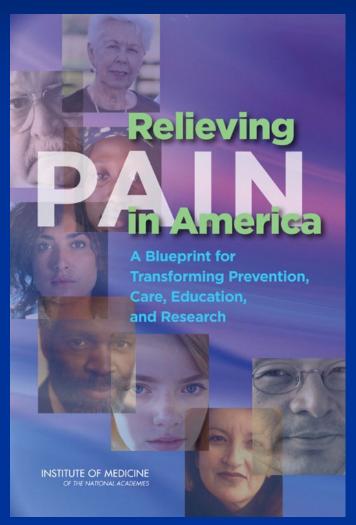
Past-President, American Pain Society
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Associate Director, Chronic Pain and Fatigue Research Center
Director, Research Development, Michigan Institute for Clinical Health Research
University of Michigan Medical Center
Ann Arbor, Michigan

Disclosures

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

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

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





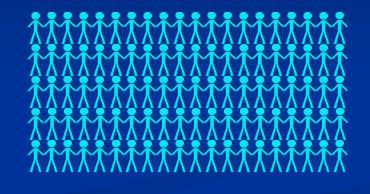




More people have Chronic Pain than Diabetes, Heart Disease, and Cancer Combined

Chronic Pain

100 Million



Diabetes

29.1 Million

Heart Disease

27.6 Million

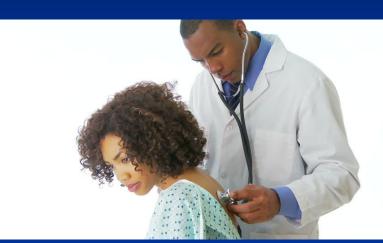
Cancer

13.7 Million

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 \uparrow = 1 Million individuals

Most Pain Care Visits occur within Primary Care













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

Primary Care Physicians Receive Little Training in Pain Management

- 80% of American Medical Schools have no formal pain education
- Those that do, report 5 or fewer hours
 - Emphasis of education is often cellular and subcellular rather than interpersonal or social in nature
- Only 34% of physicians reported feeling comfortable treating chronic pain
 - Only 1% found it a satisfying practice

Survey of Primary Care Physicians treating Chronic Pain

- 34% no longer accepted new patients with chronic pain
- 79% currently prescribe opioids for chronic pain
- 72% of physicians lacked alternative treatments to opioids

Educational Priorities of Primary Care Physicians treating Chronic Pain

- How to find options other than opioids for treating chronic pain
- Weaning patients from opioids
- How to find Substance Use, Behavioral Health and Pain Management in their communities and get them reimbursed.

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

Biopsychosocial model
Interdisciplinary
Pain Management

- Procedure Driven
- Focus on curing/fixing

Patient is passive recipient

- 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

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...

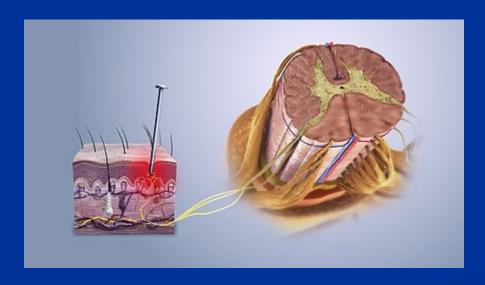
- They must be crazy
- The pain is all in their heads
- They don't want to get better

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

- Damaged tissue and pain are not the same thing
- Sometimes they occur together, so they seem to be the causal
- Nociception provides bodily information that may or may not be interpreted as pain





Nociception

PAIN

Thinking Differently about Pain

- Pain is a Perceptual Experience
- Pain is less like tissue damage and more like other sensory perceptions:
 - hunger, itch, tickle, urinary urgency, orgasm

Thinking Differently about Pain

Treating a perception requires different skills and techniques than fixing damaged tissues

How is Pain Classified?

Time Body Location Suspected Etiology

Acute Vs Chronic Head, Neck, Back, Pelvis Cancer, Rheumatic, etc.

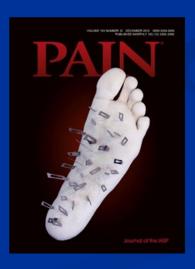
Newest Classification: Pain Mechanisms

Nociceptive Peripheral damage or inflammation

Neuropathic

Central







Mechanisms of Pain

Nociceptive and Inflammatory

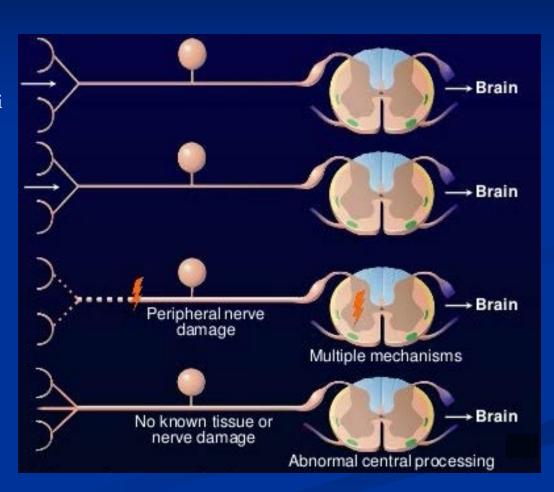
Noxious Peripheral Stimuli

Inflammation

Neuropathic

Peripheral or Central damage

Centrally Driven Pain



Mechanisms of Pain

Nociceptive and

Inflammatory

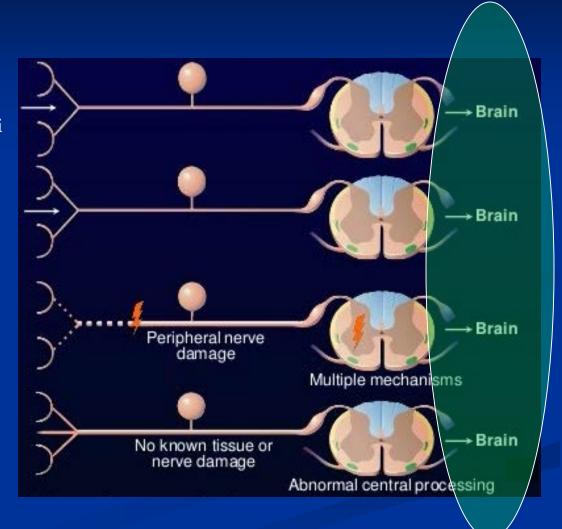
Noxious Peripheral Stimuli

Inflammation

Neuropathic

Peripheral or Central damage

Centrally Driven Pain



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



Neurobiological perspective

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

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I still feel pain



CNS Neurotransmitters Influencing Pain

Facilitation

Gabapentinoids, ketamine

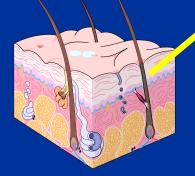
Glutamate and EAA

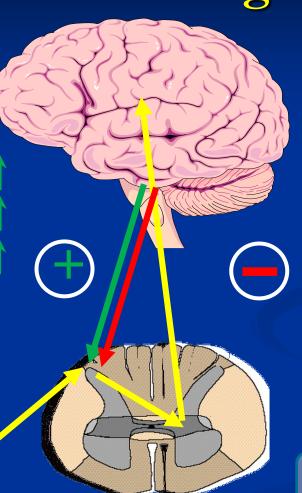
Substance P

Nerve growth factor

Serotonin (5HT_{2a, 3a})

Anti-migraine drugs (– triptans), cyclobenzaprine





Inhibition

Descending antinociceptive pathways

Norepinephrineserotonin (5HT_{1a.b}), dopamine

Tricyclics, SNRIs tramadol

Opioids

Low dose naltrexone

Cannabinoids

GABA

Gammahydroxybutyrate, moderate alcohol consumption No knowledge of endocannabinoid activity but this class of drugs is effective

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

<u>Norepinephrine</u>

Concentration
Circadian rhythms
Attention
Stress
Energy

Norepinephrine |

Concentration
Circadian rhythms
Attention
Stress
Energy

Serotonin

Well-being Sleep Affect /Mood Appetite

Norepinephrine

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Well-being
Sleep
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Appetite

<u>Dopamine</u>

Attention
Pleasure
Reward

Norepinephrine

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Glutamate

Major Exciter of CNS, Synaptogenesis and neurogenesis

Norepinephrine |

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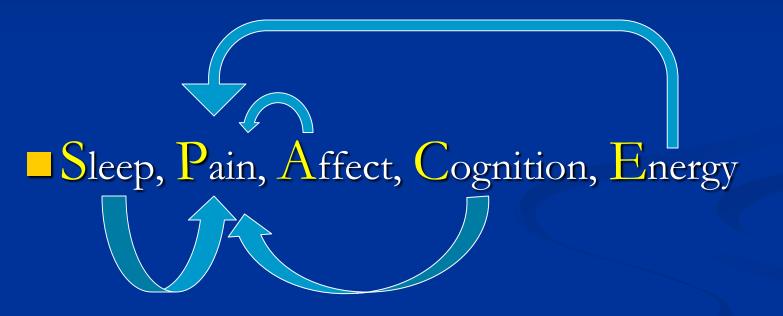
Major Inhibitor of CNS, Sleep/wake cycle

Shared Neurotransmitters Explain

■ The complexity of chronic pain presentation

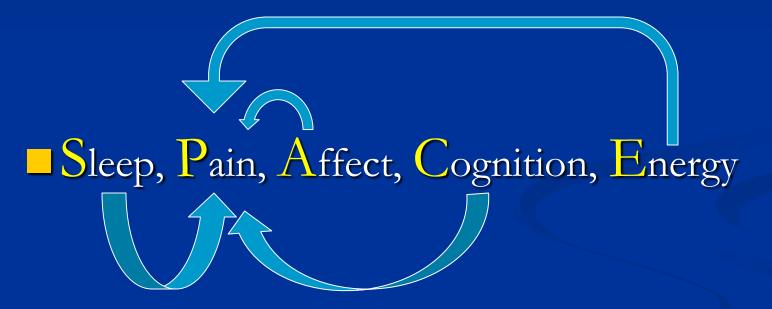
Shared Neurotransmitters Explain

■ The complexity of chronic pain presentation



Shared Neurotransmitters Explain

■ The complexity of chronic pain presentation



■ New targets for treating pain perception

A Closer Look at Central Pain

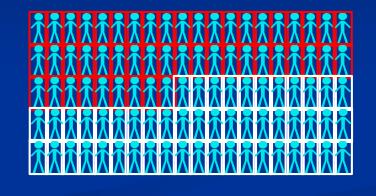


Pain

In U.S., More people have Chronic Pain than Diabetes, Heart Disease, and **Cancer Combined**

Chronic Pain

100 Million



Diabetes

29.1 Million

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Cancer

13.7 Million

= 1 Million individuals

Chronic Overlapping Pain Conditions

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

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.



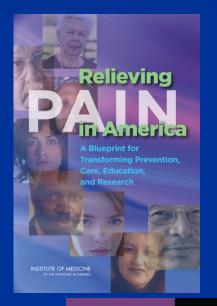


So what's a doctor to do?



Recommendations in Multiple Federal Documents

Self-Management, Evidence-Based, Patient-Centric, Multi-Modal Pain Care





National Pain Strategy

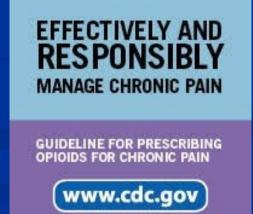
A Comprehensive Population Health-Level Strategy for Pain

Healthy People.gov

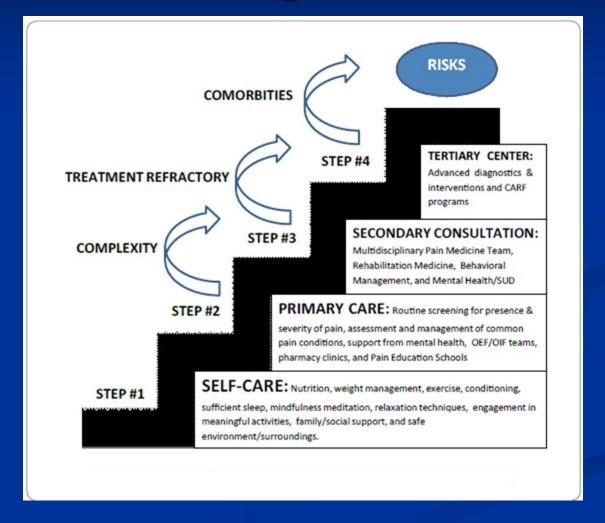


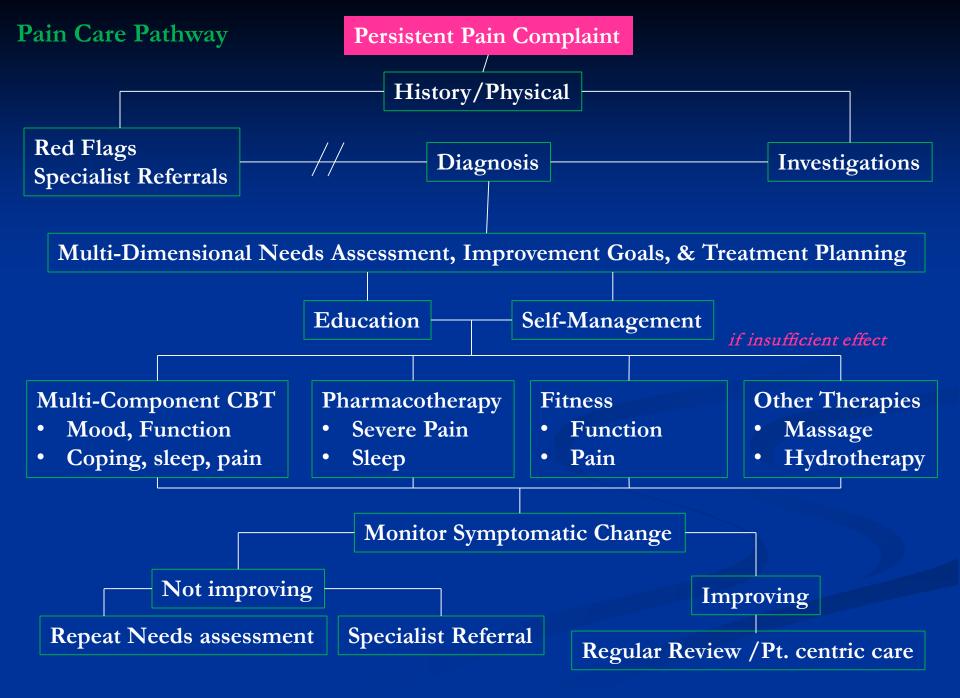


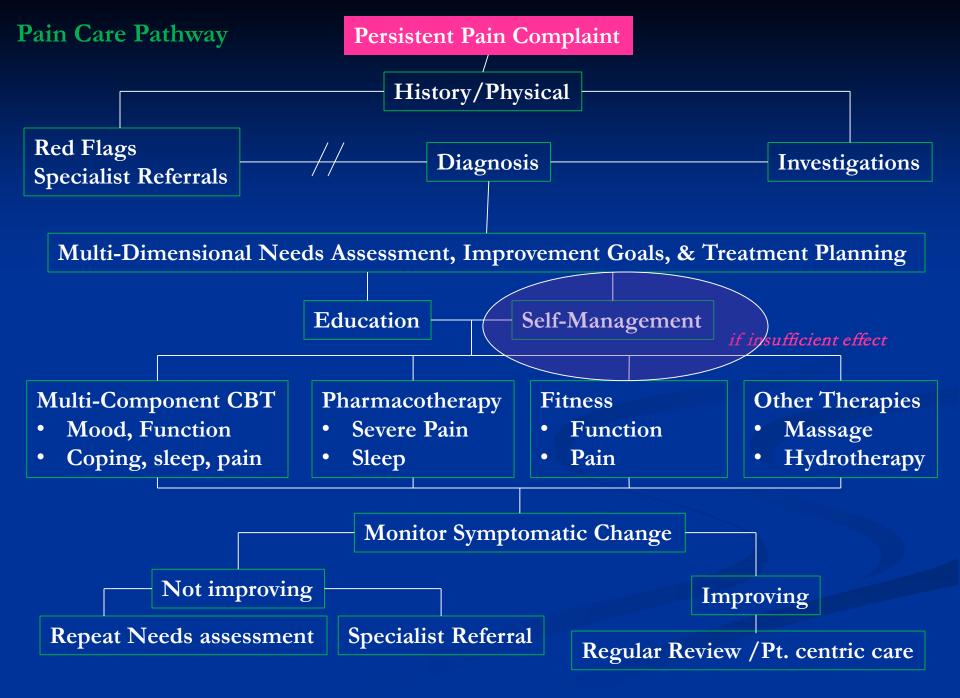




VA's Stepped Care Model of Pain Management







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

Emotions

Reflections

Actions

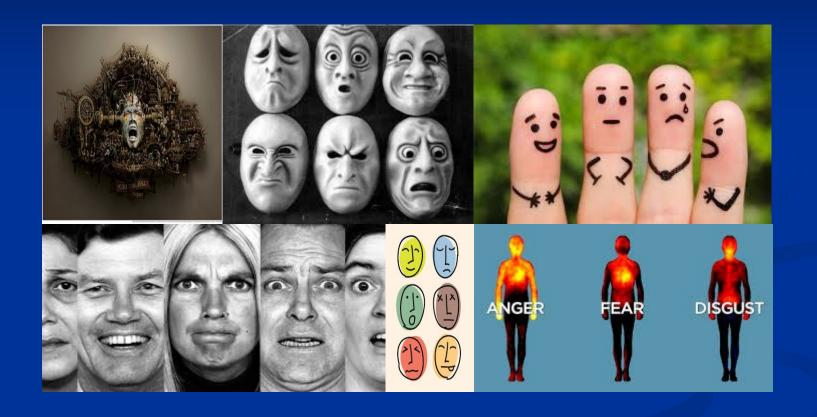
Sleep

Environment

Sleep, Pain, Affect, Cognitive changes, Energy deficits

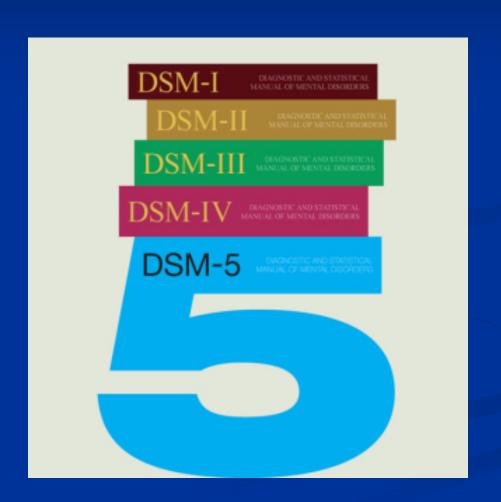
ERASE

Emotions



Altering pain perception through Emotions

Psychiatric Co-Morbidities



Psychiatric Co-Morbidity in Chronic Pain

	Depression	Anxiety
General Population:	6.6%	18.1%

Chronic Pain:

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

 $44^{0}/_{0}$

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)



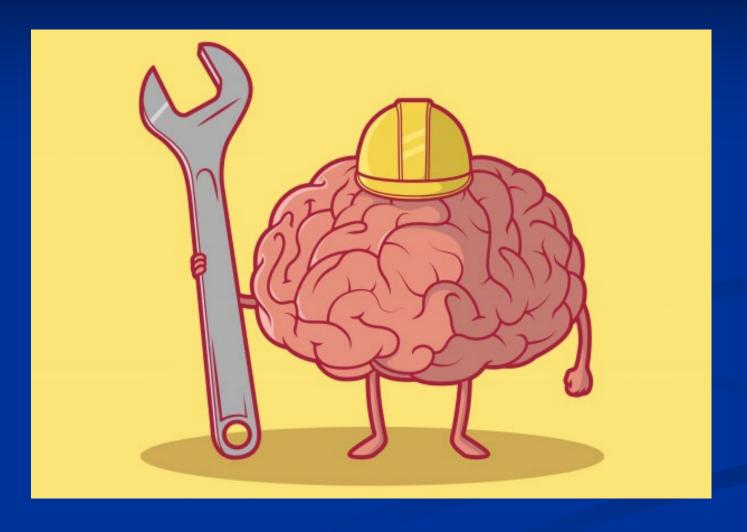
Pleasant Activity Scheduling



Traditional Psychotherapy

ERASE

Reflections



Using Cognition to alter pain perceptions

Reframing







Perspective...

The Relaxation Response







Visual Imagery



Meditation



Biofeedback

ERASE

Actions



Using <u>Behavior</u> to alter pain perceptions and provide a foundation of wellness

Exercise

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





Lifestyle Physical Activity





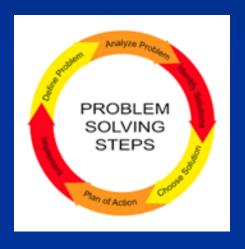


Pacing for Energy Efficiency





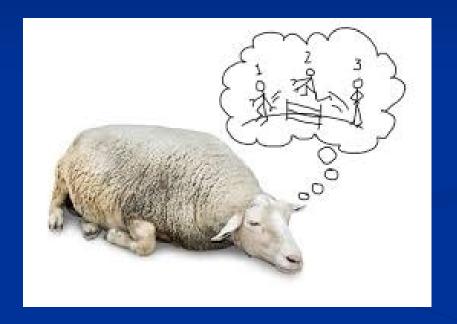
Problem Solving / Goal Setting





ERASE

Sleep



Altering Pain via Sleep

Behavioral and Sleep Hygiene Skills

Timing

Regular bed time/wake time

Sleep Behavior

Get in bed only when sleepy Use bed for sleep Get up after 15' if no sleep

Thermal Tips

Decline in core temp signals sleep Exercise, warm bath before bed

Environment

Steady room temperature Keep room dark

Ingestion

Decrease nicotine
Decrease Caffeine
Alcohol interferes with sleep
Light snack is recommended

Mental Control

Effort will not produce sleep Avoid mental stimulation Seek mental quiescence

ERASE

Environment



Using the Environment to alter pain perceptions and provide a foundation of wellness

Social Challenges



Dr. -Patient



Family



Friends



Employer and co-workers

Physical Challenges



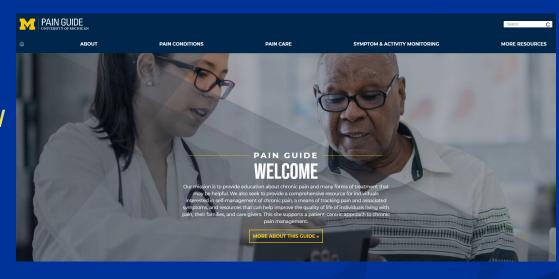




Web-based self-management



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



Coming soon: PAIN Guide

FibroGuide and Pain Guide can serve as the foundation for CBT

FibroGuide

An Online Self-Management Program for Individuals with Fibromyalgia

Facilitator's Manual

David A Williams, Ph.D.

Professor, University of Michigan

Adapted from Living Well with Fibromyalgia

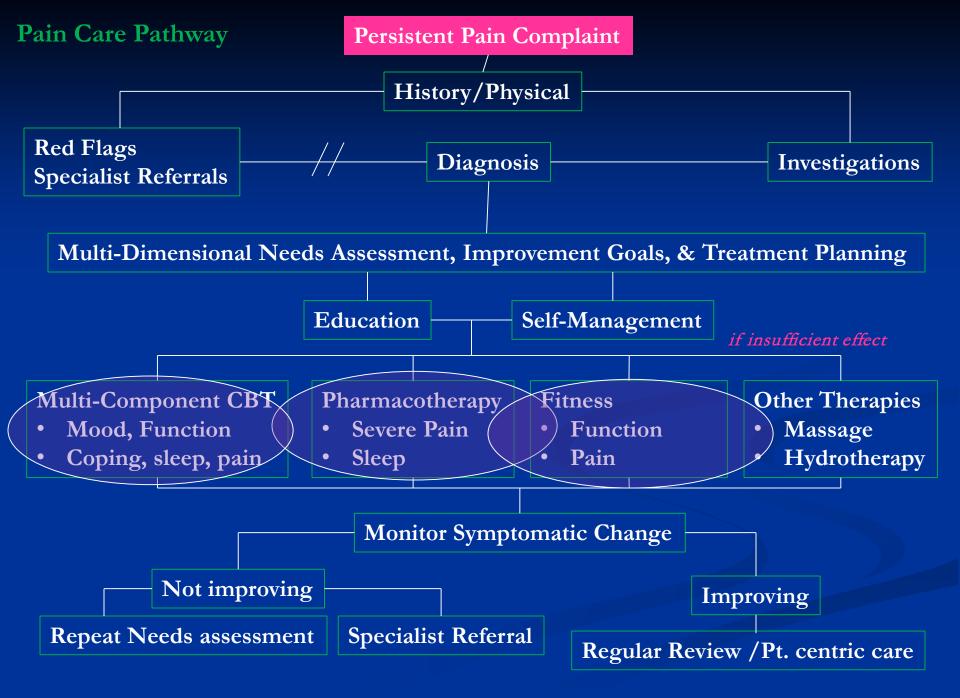
To be used with $\underline{FibroGuide.com}$ or $\underline{FibroGuide.med.umich.edu}$

Pain Guide

An Online Self-Management Program for Individuals with Chronic Pain

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Pharmacological Therapies for Central Pain States

Strong Evidence

- Dual reuptake inhibitors such as
 - Tricyclic compounds (amitriptyline, cyclobenzaprine)
 - SNRIs and NSRIs (milnacipran, duloxetine, venlafaxine?)
- Anticonvulsants (e.g., pregabalin, gabapentin)

Modest Evidence

- Tramadol
- Older less selective SSRIs
- Gamma hydroxybutyrate
- Low dose naltrexone
- Cannabinoids

Weak Evidence

 Growth hormone, 5-hydroxytryptamine, tropisetron, S-adenosyl-L-methionine (SAMe)

No Evidence

 Opioids, corticosteroids, nonsteroidal anti-inflammatory drugs, benzodiazepine and nonbenzodiazepine hypnotics, guanifenesin

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

Bottom Line

- 1. Pain is not located in a body part. It is a perception and needs to be treated as a perception.
- 2. Taking time to just listen to the patient's story is a necessary part of pain treatment. 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.