

# **Pain Management: Rationale for the BioPsychoSocial Perspective**

**MI-CCSI**

**David A. Williams, Ph.D.**

Professor of Anesthesiology, Medicine, Psychiatry and Psychology  
Associate Director, Chronic Pain and Fatigue Research Center

Co-Director, Research Development, Michigan Institute for Clinical Health Research (MICHR)

Director, Network-based Research Unit, MICHR

University of Michigan Medical Center

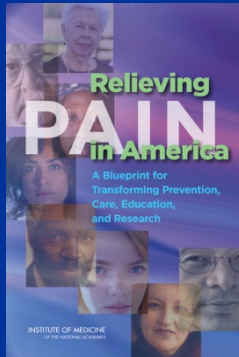
Ann Arbor, Michigan

# Disclosures

- Consultant to Community Health Focus Inc.
- Consultant to Swing Therapeutics, Inc.
- Funded for research by NIH

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

# Chronic Pain Numbers



100 Million People  
- US

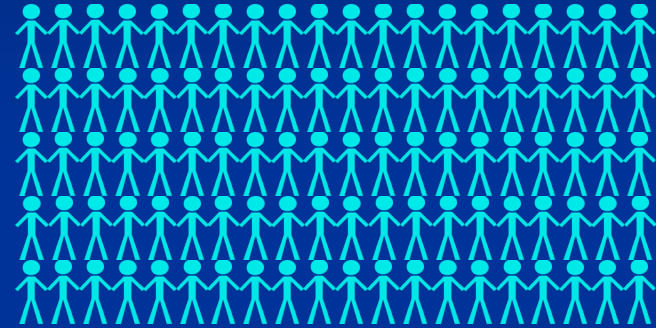


150 Million  
- 37 Countries

Eccleston, C., Wells, C. (2017).  
European Pain Management.  
Oxford University Press

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

Chronic Pain 100 Million



Diabetes 29.1 Million



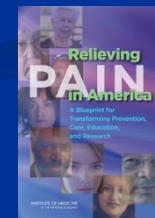
Heart Disease 27.6 Million



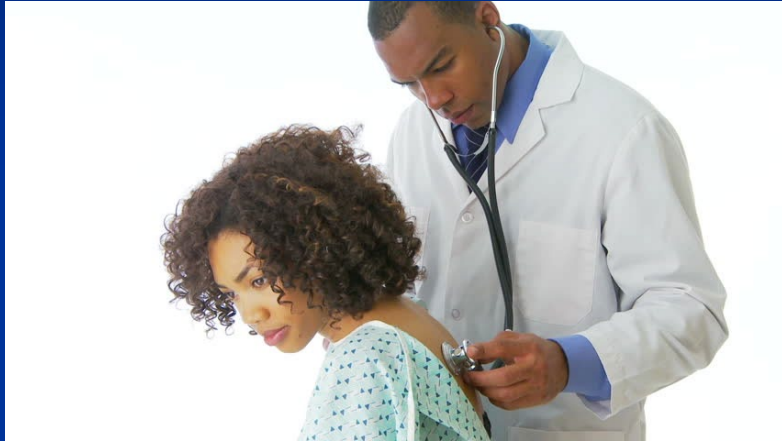
Cancer 13.7 Million



 = 1 Million individuals



# Most Pain Care Visits occur within Primary Care



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

# 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

# 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



# Are Invasive Procedures Effective for Chronic Pain? A Systematic Review

Wayne B. Jonas, MD,\* Cindy Crawford,<sup>†</sup> Luana Colloca, MD, PhD,<sup>‡</sup> Levente Kriston, PhD,<sup>§</sup> Klaus Linde, MD, PhD,<sup>¶</sup> Bruce Moseley, MD,<sup>||</sup> and Karin Meissner<sup>||,\*\*\*</sup>

**Conclusions.** There is little evidence for the specific efficacy beyond sham for invasive procedures in chronic pain

*Pain Medicine*, 20(7), 2019, 1281–1293

doi: 10.1093/pm/pny154

Advance Access Publication Date: 10 September 2018

Review Article

OXFORD

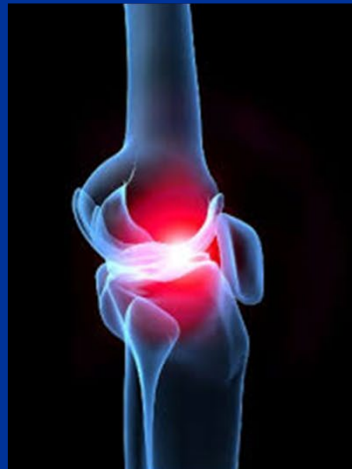
# **We Need to Approach Chronic Pain Differently**

# How is Pain Classified?

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

## Newest Classification: Pain Mechanisms

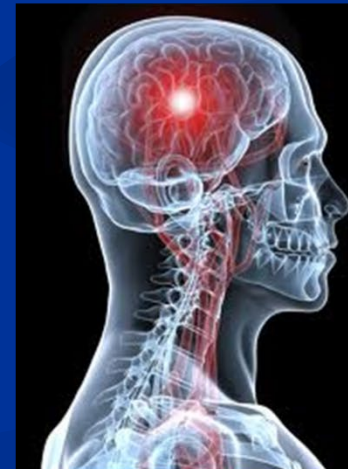
**Nociceptive**  
Peripheral damage  
or inflammation



**Neuropathic**



**Central**



# Nociceptive Pain

(mechanical, thermal, chemical)



# Neuropathic Pain



Peripheral

Central

Post-Stroke



# Central (Nociplastic) 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

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

# Mechanisms of Pain

**Nociceptive  
and  
Inflammatory**

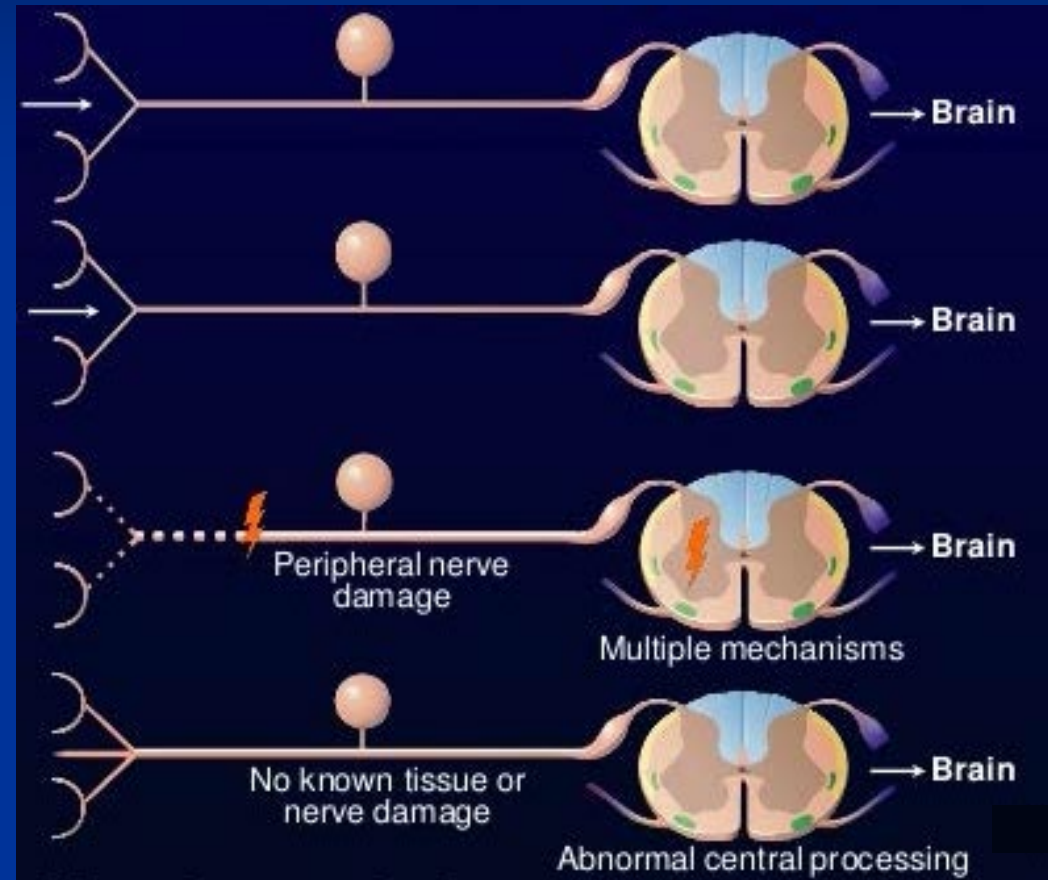
Noxious  
Peripheral Stimuli

Inflammation

**Neuropathic**

Peripheral or  
Central damage

**Centrally Driven Pain**



# Mechanisms of Pain

**Nociceptive  
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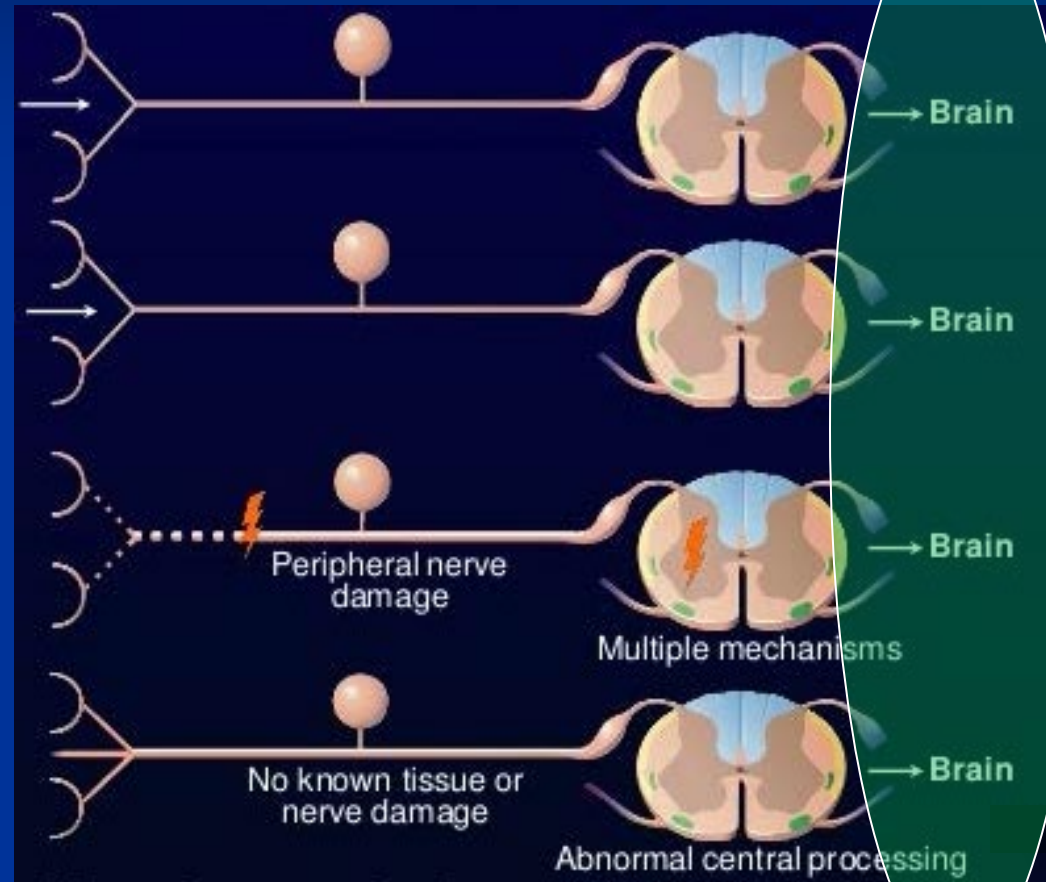
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Peripheral or  
Central damage

**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



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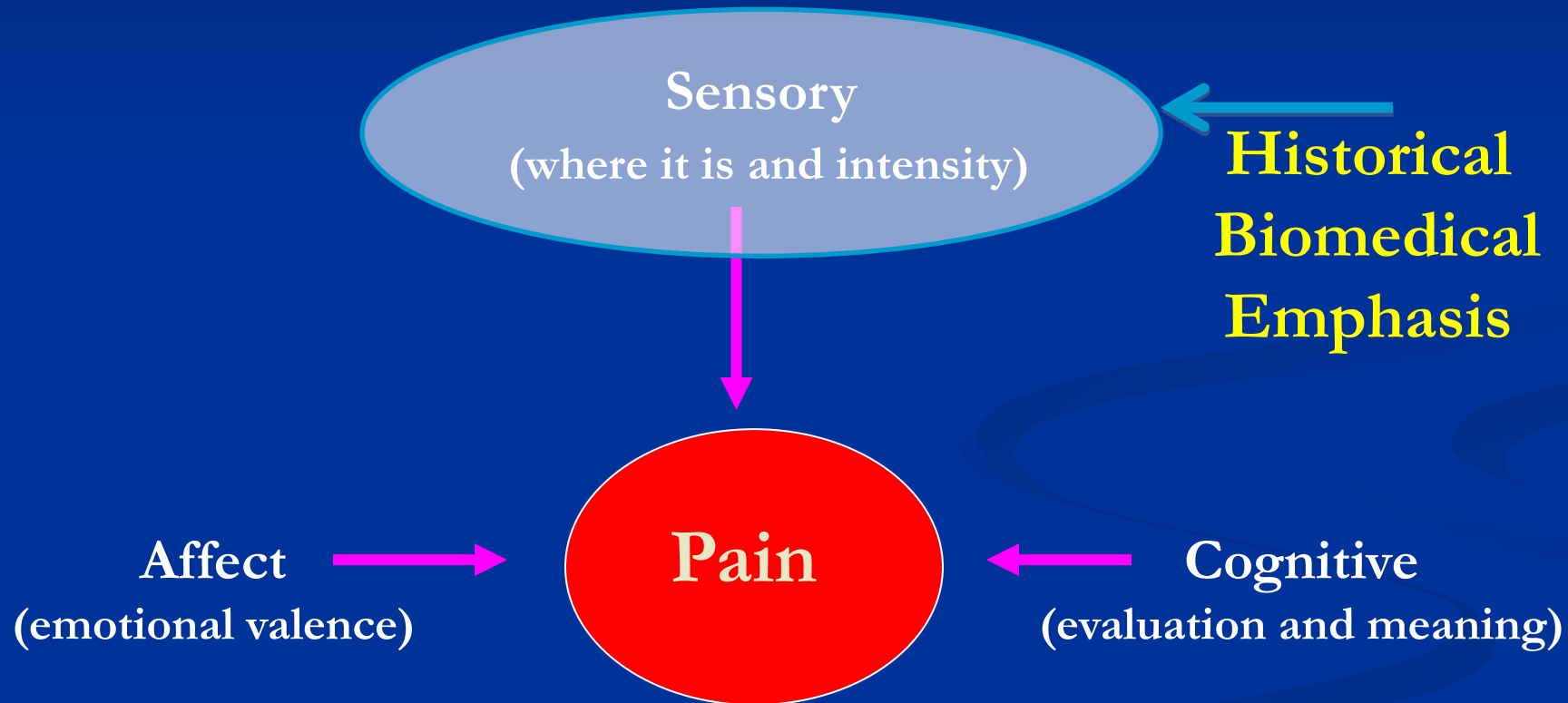
## ■ Affective / Cognitive dimensions

- Anterior insula
- Prefrontal cortex
- Anterior cingulate cortex
- Thalamus
- Amygdala
- Hippocampus

I still feel  
pain



# Chronic Pain has Three Components: The BioMedical Model Focuses on 1 of Them





# Thinking Differently about Chronic Pain

- Pain is a **Perceptual Experience** formed in the brain
  - Other perceptual experiences with flexible biological associations include the following:
    - hunger, itch, tickle, urinary urgency, orgasm

# Thinking Differently about Chronic Pain

- Treating a perception requires different techniques than fixing damaged tissues

# CNS Neurotransmitters

## Influencing Pain

### Facilitation

Gabapentinoids,  
ketamine

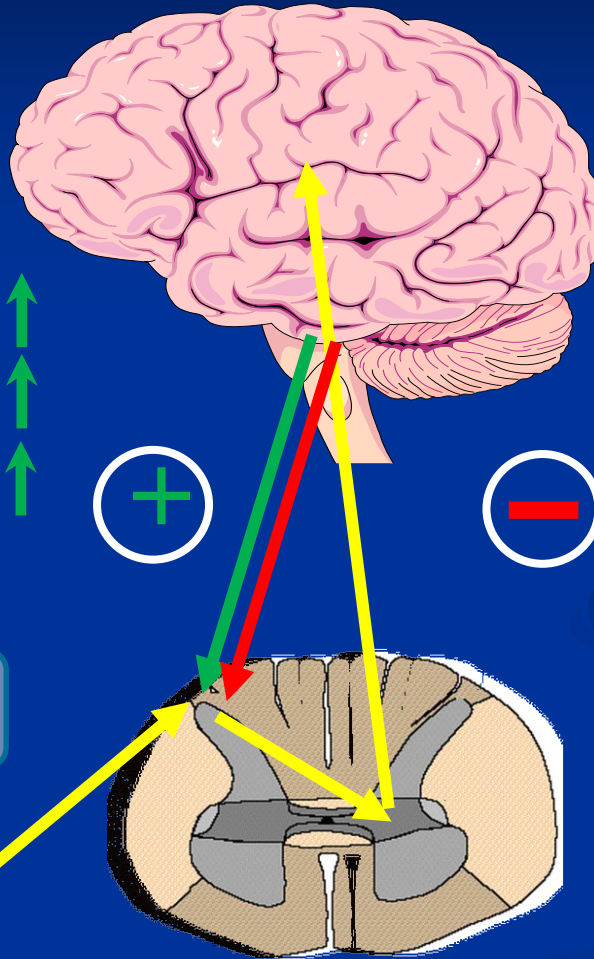
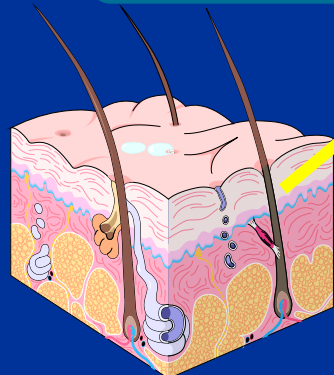
Glutamate and EAA

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

GABA

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

Gammahydroxybutyrate,  
moderate alcohol  
consumption

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



# Neurotransmitters for Pain Processing

## Norepinephrine

Concentration

Circadian rhythms

Attention

Stress

Energy

# Neurotransmitters for Pain Processing

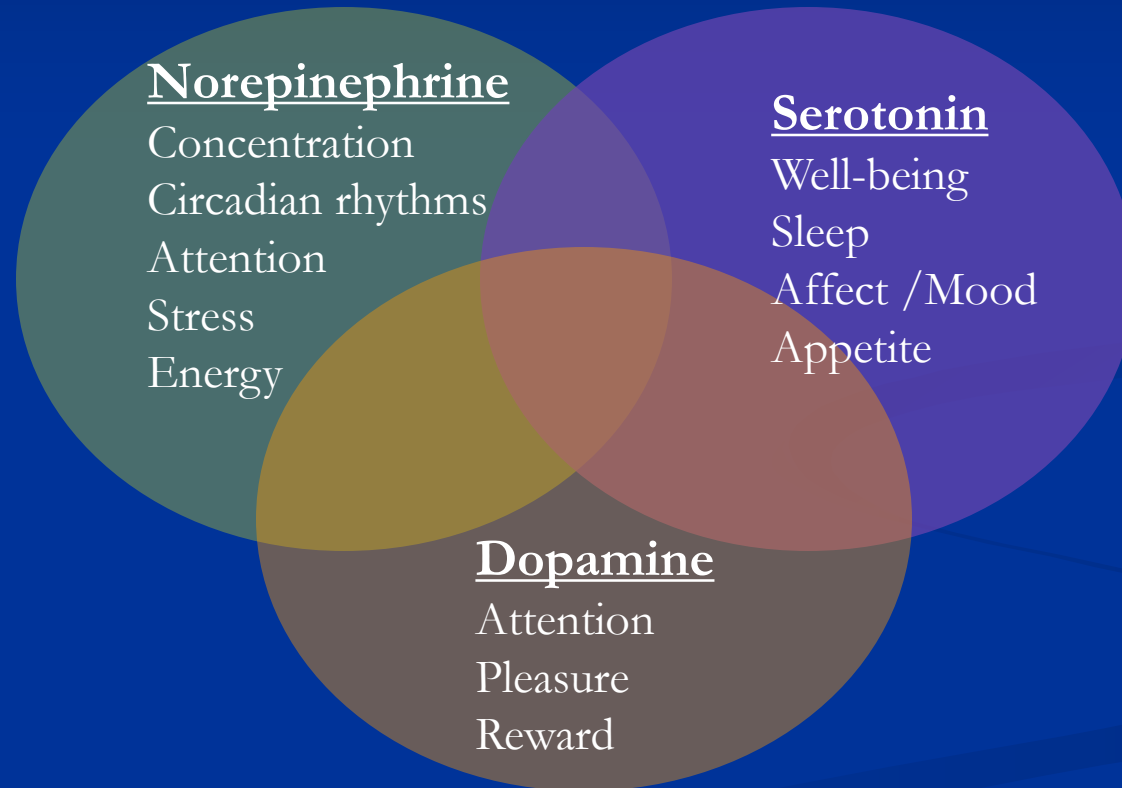
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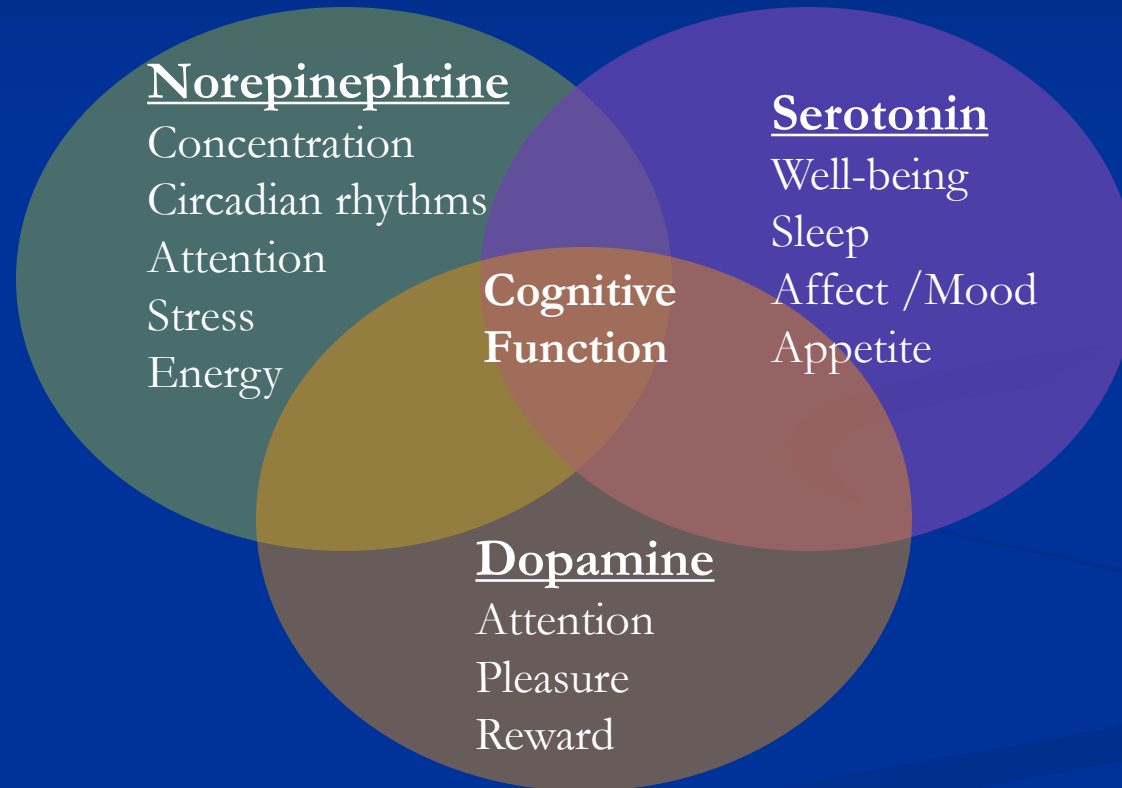
## Serotonin

Well-being  
Sleep  
Affect /Mood  
Appetite

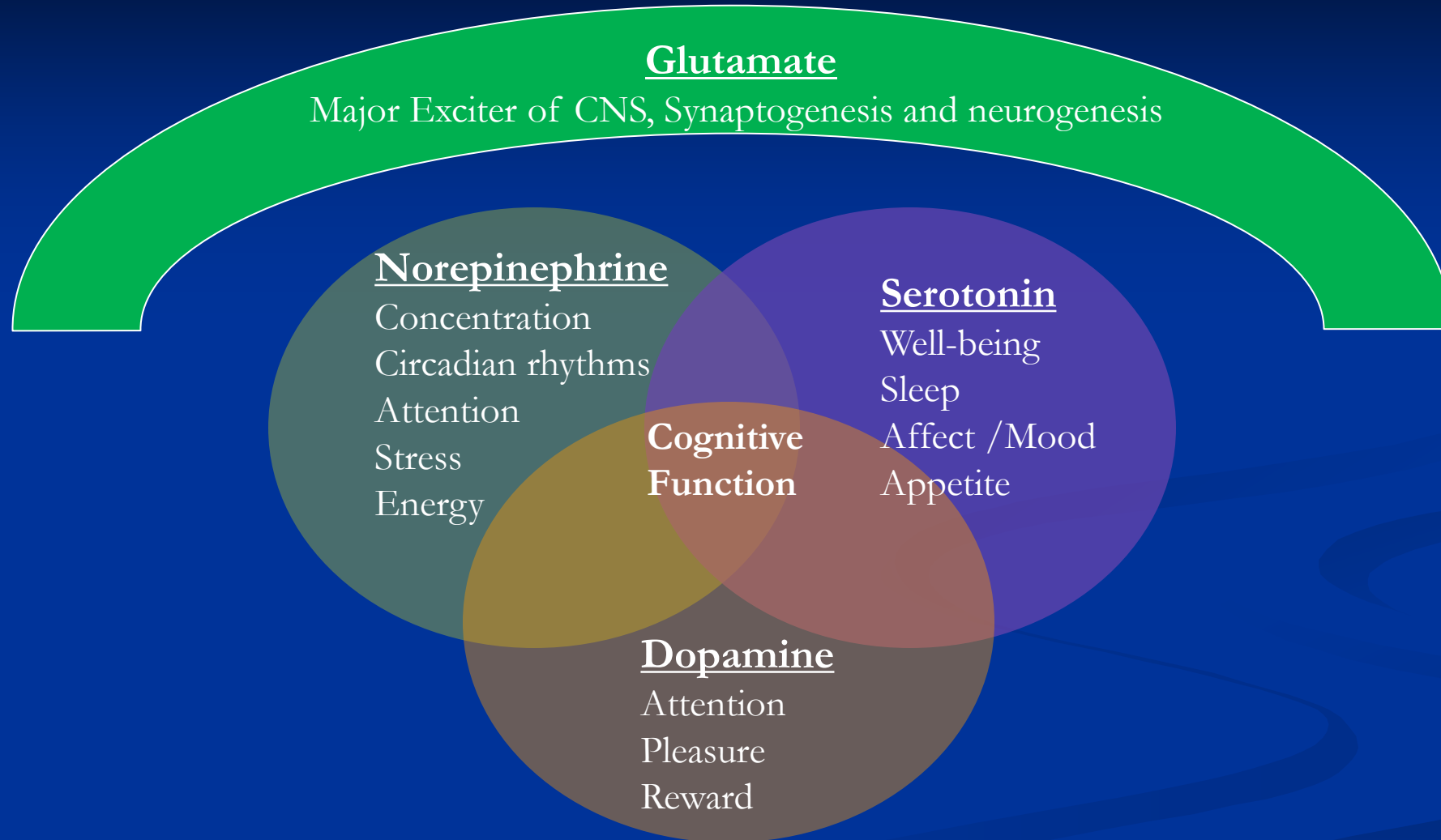
# Neurotransmitters for Pain Processing



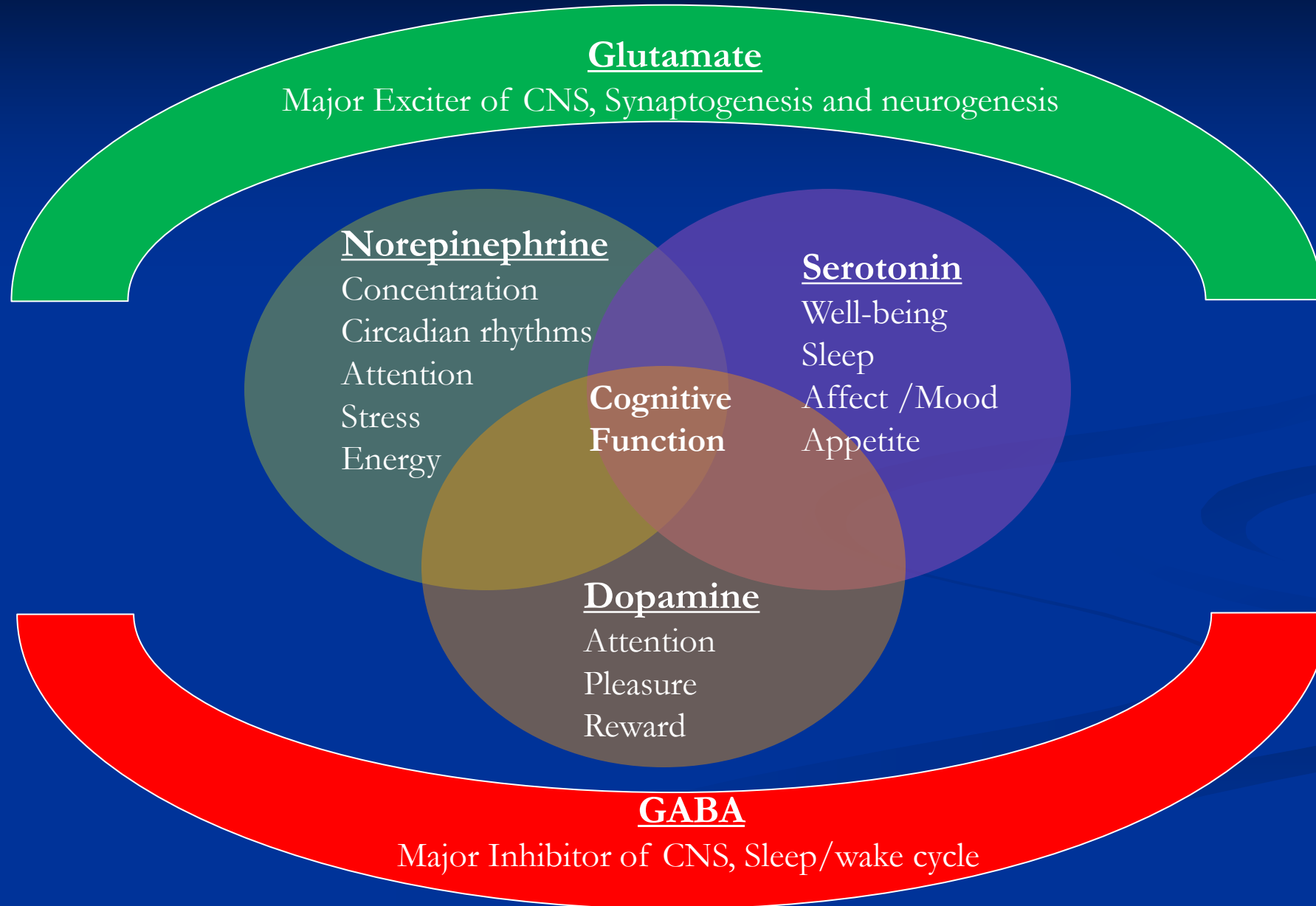
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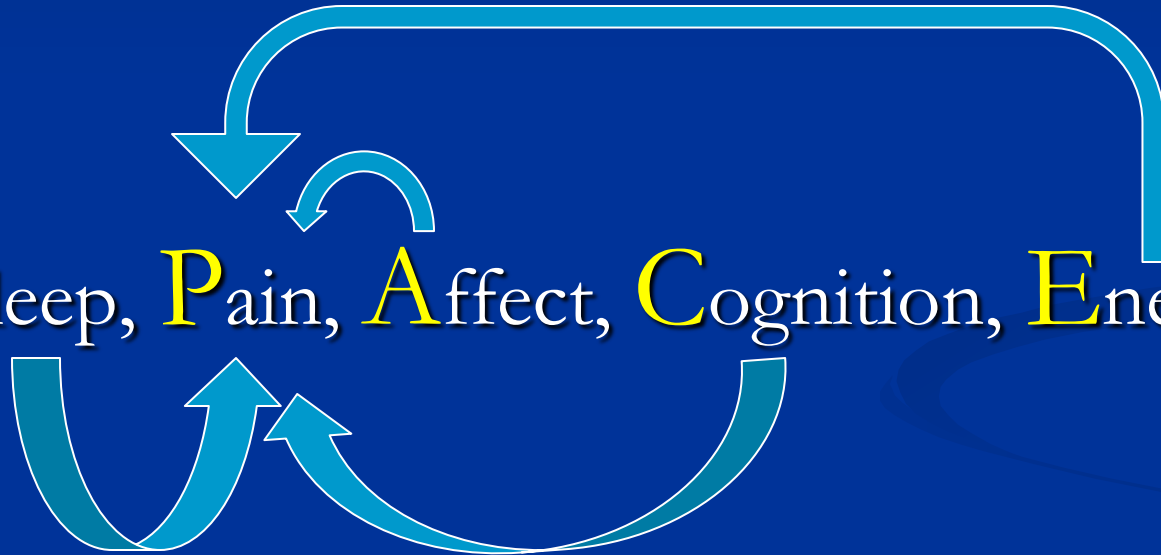
# Shared Neurotransmitters Explain

- The complexity of chronic pain presentation

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- The complexity of chronic pain presentation

■ Sleep, Pain, Affect, Cognition, Energy

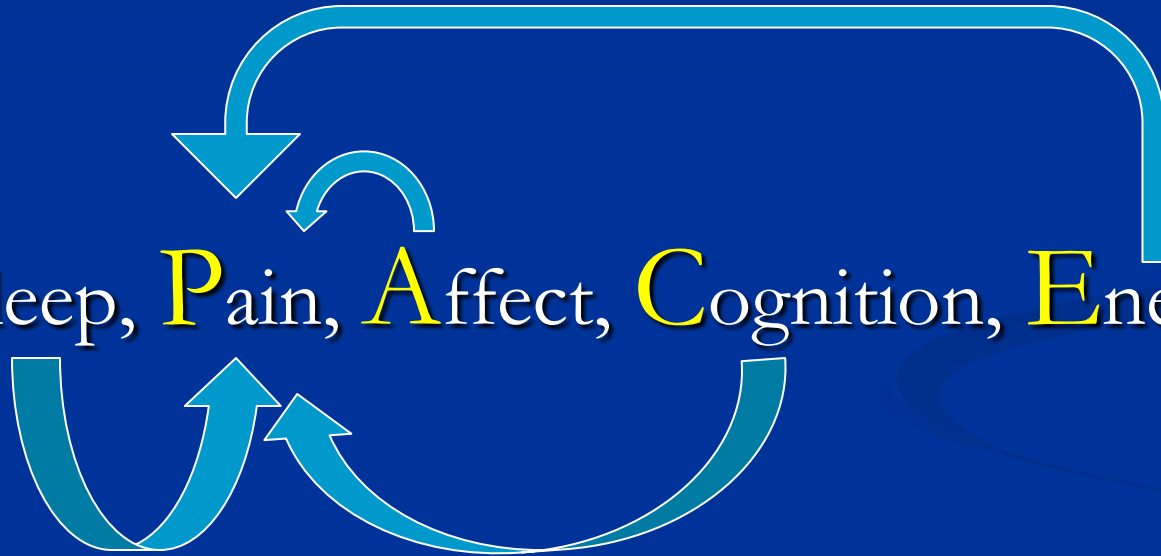




# Shared Neurotransmitters Explain

- The complexity of chronic pain presentation

■ Sleep, Pain, Affect, Cognition, Energy



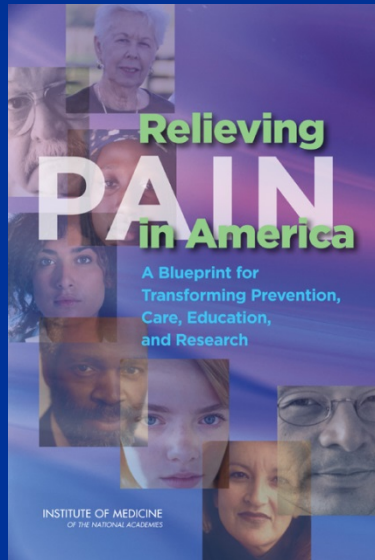
- **SPACE** represents new targets for treating pain perception

# So what's a doctor to do?

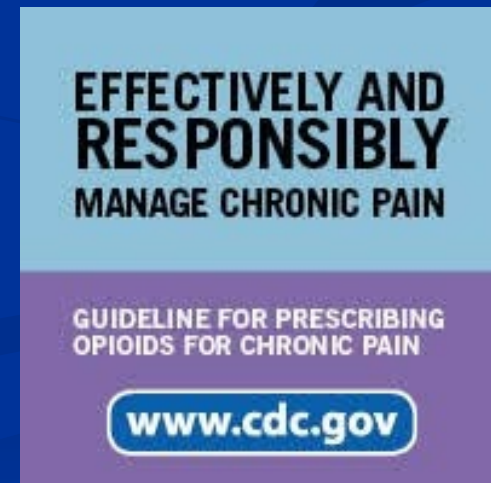


# Recommendations in Multiple Federal Documents

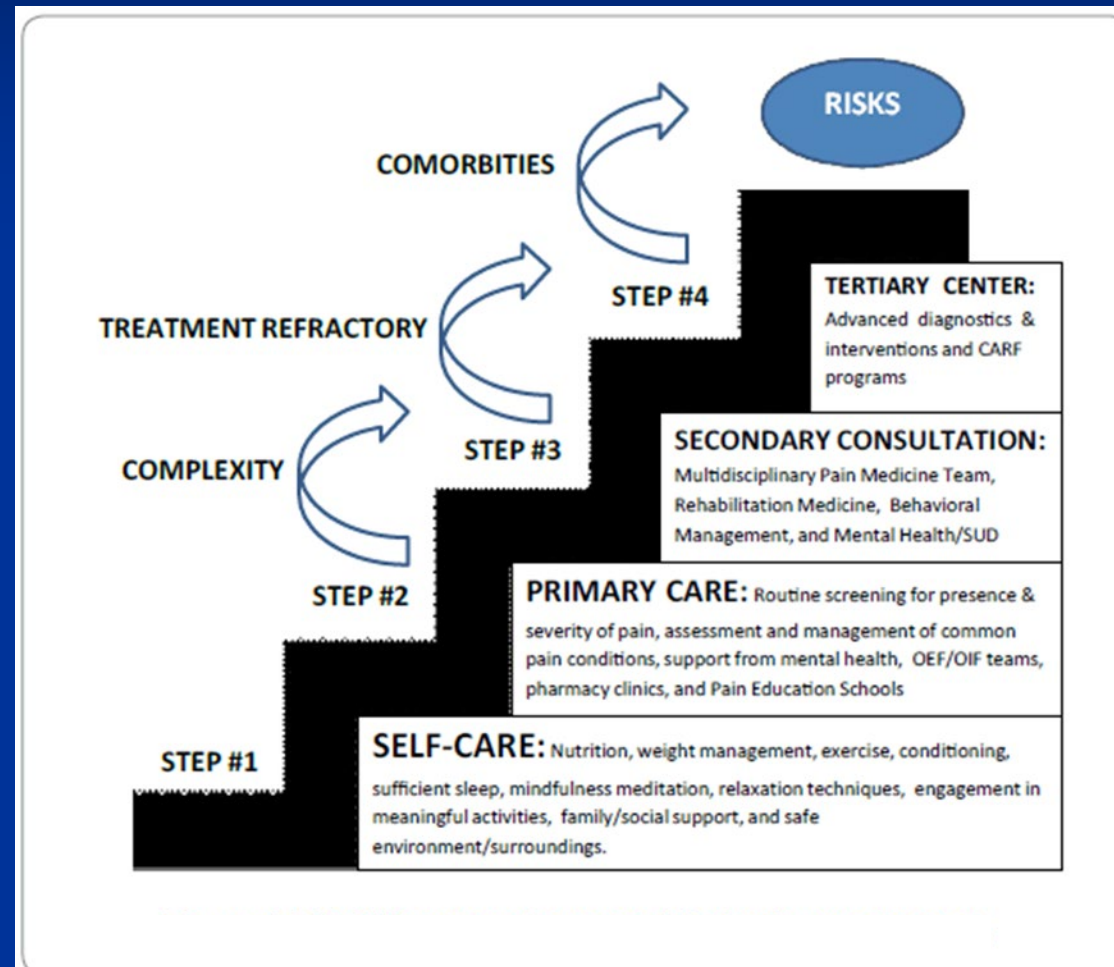
Self-Management, Evidence-Based, Patient-Centric,  
Multi-Modal Pain Care



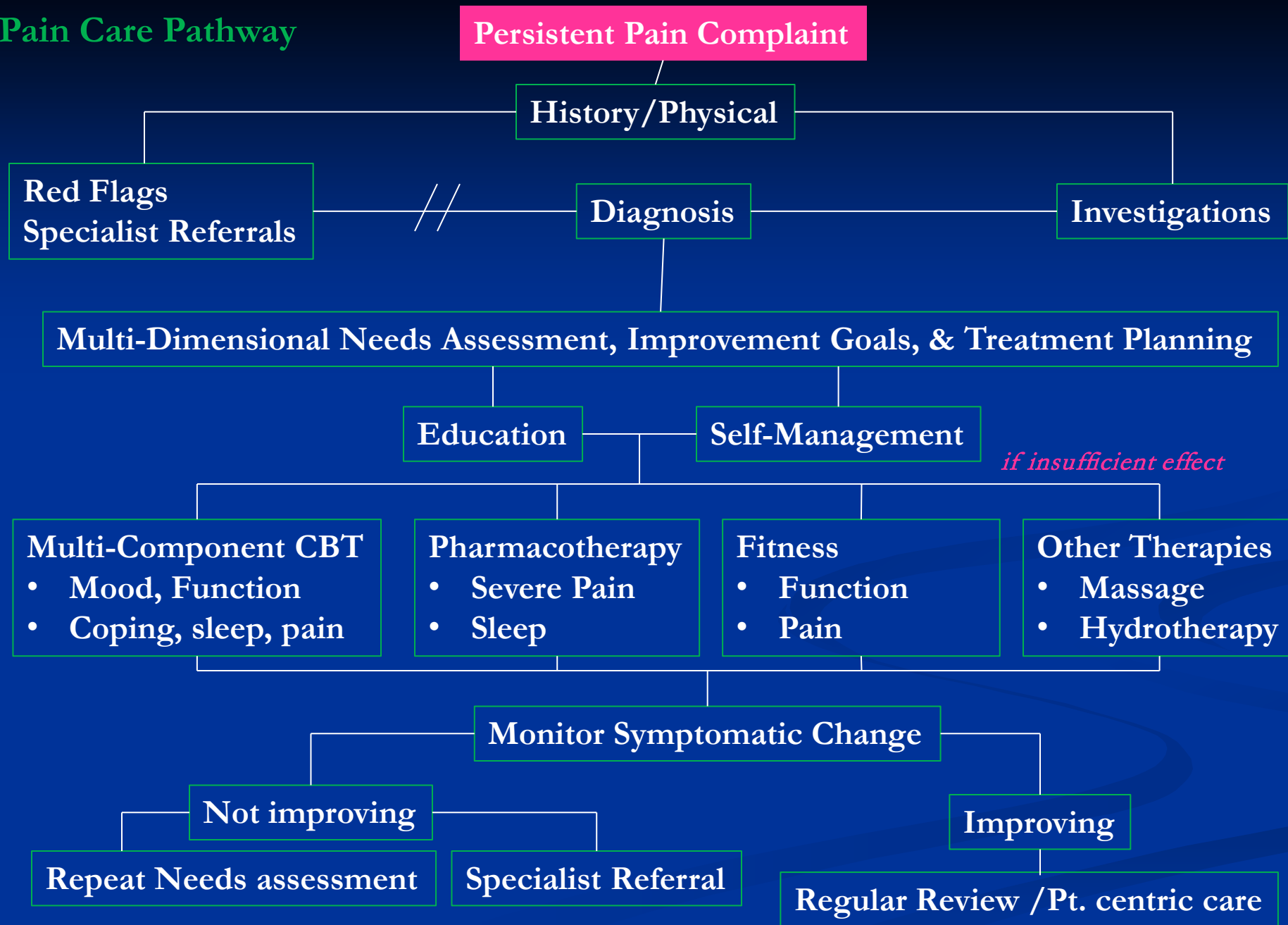
HealthyPeople.gov



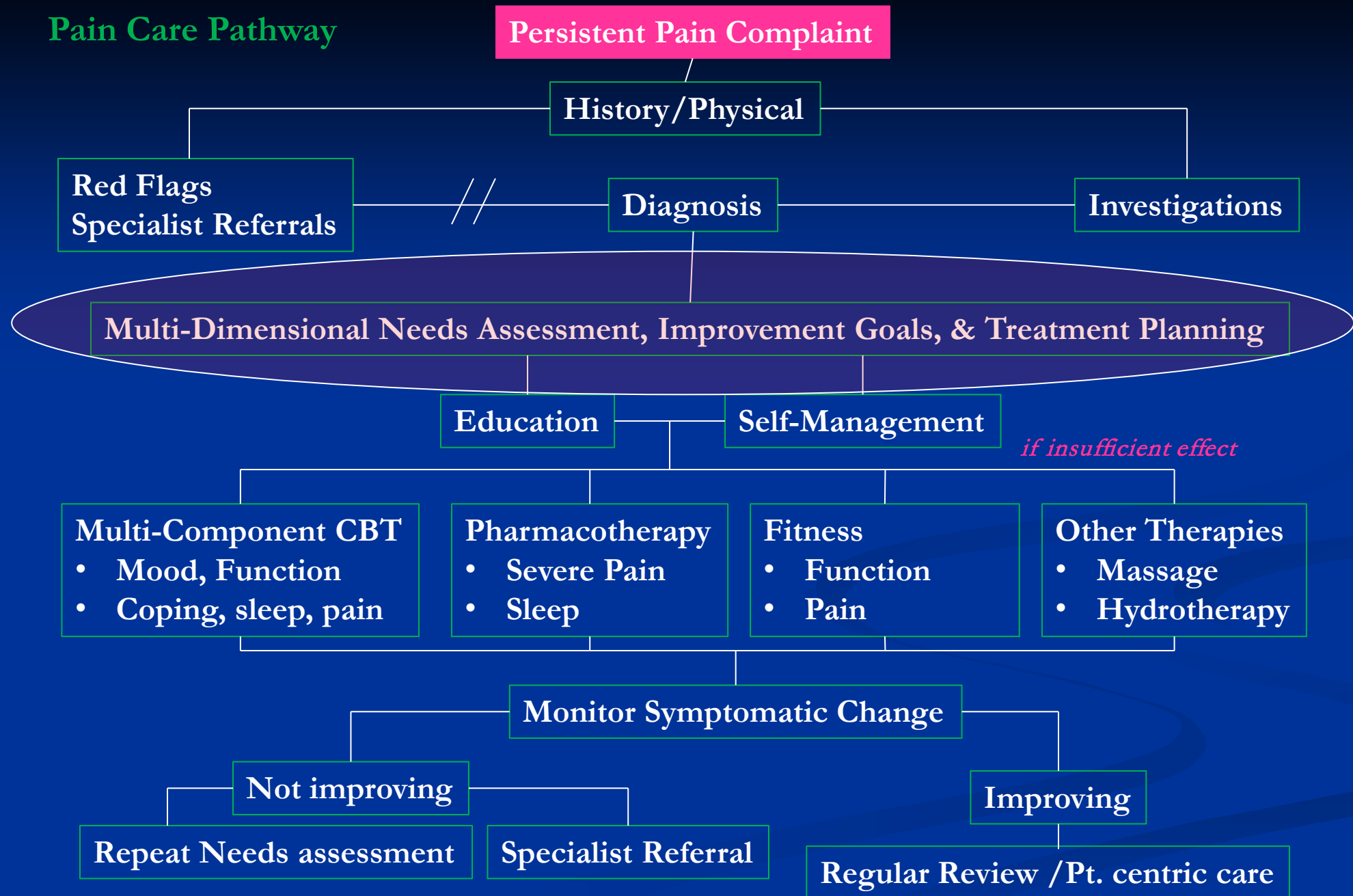
# VA's Stepped Care Model of Pain Management



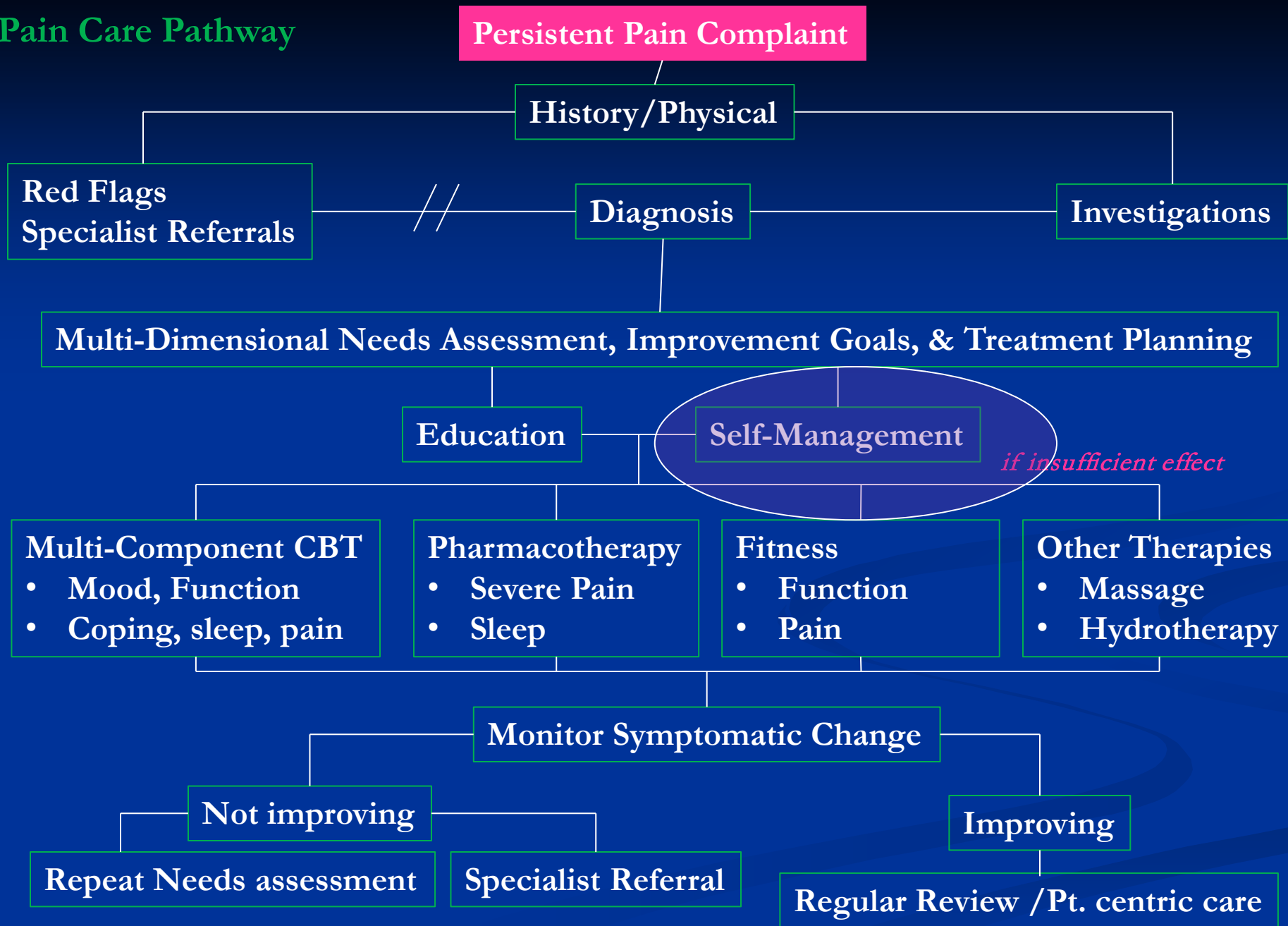
# Pain Care Pathway



# Pain Care Pathway



# Pain Care Pathway



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

Emotions

Reflections

Actions

Sleep

Environment

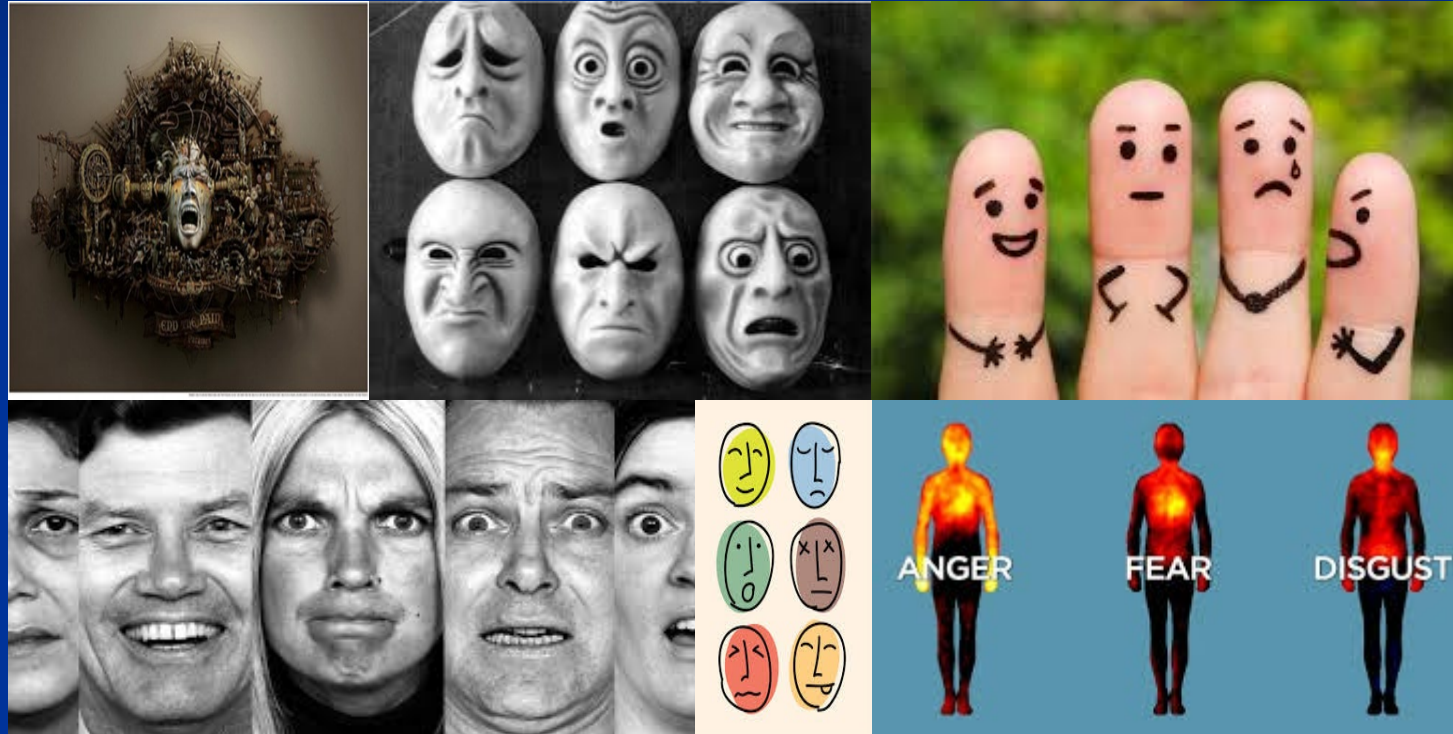


Sleep, Pain, Affect, Cognitive changes, Energy deficits



**ERASE**

# Emotions



Altering pain perception through Emotions

**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)



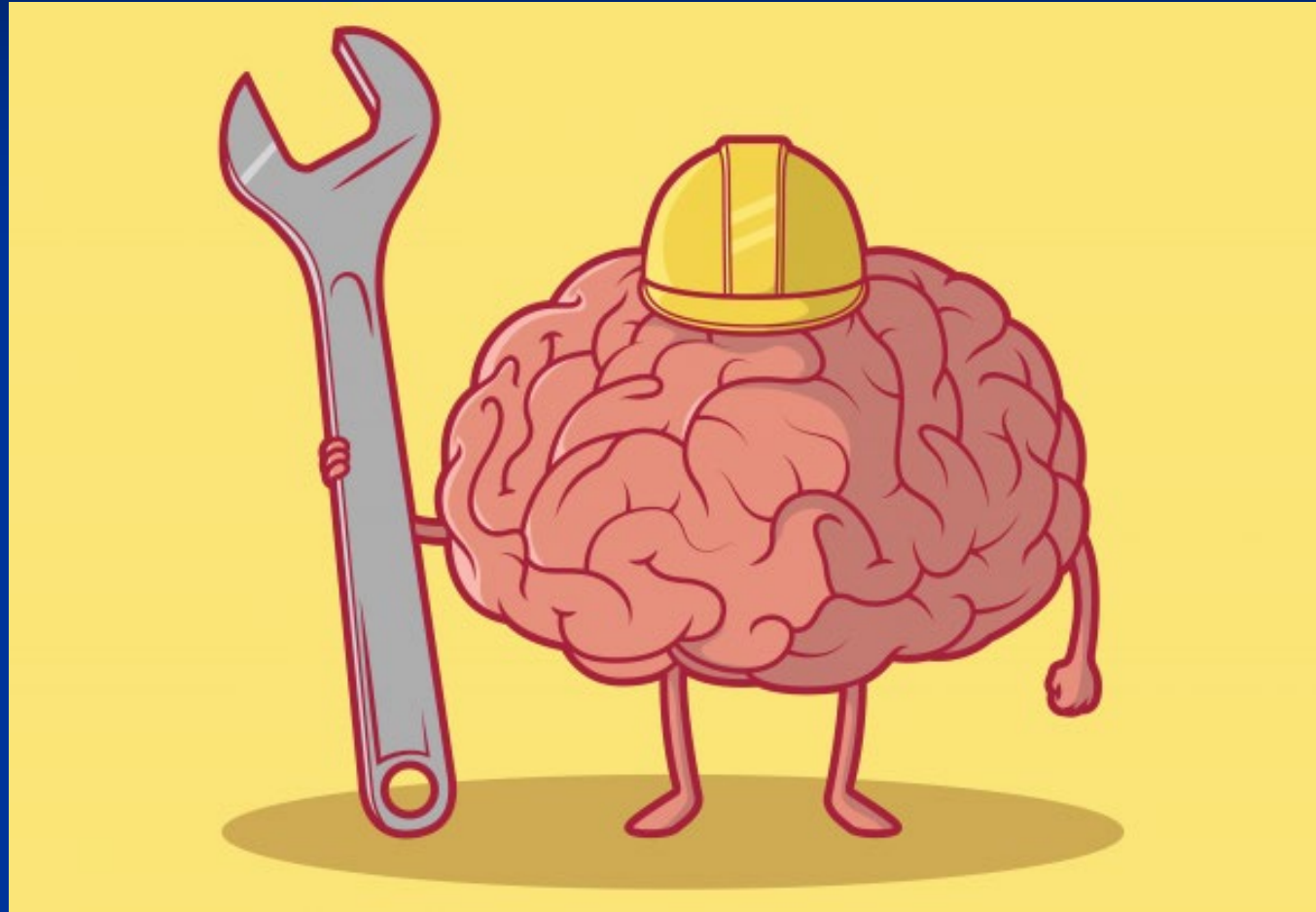
Pleasant Activity Scheduling



Traditional Psychotherapy

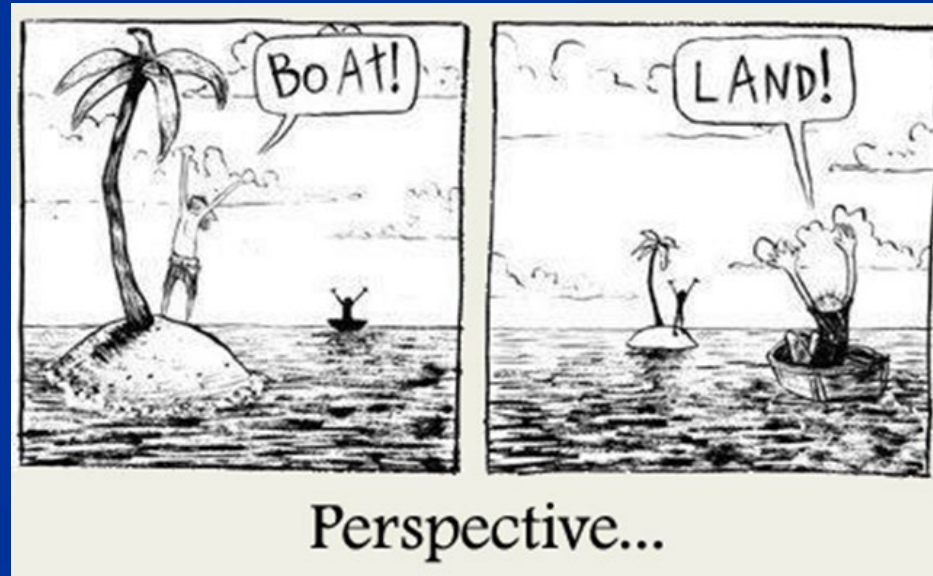
ERASE

## Reflections

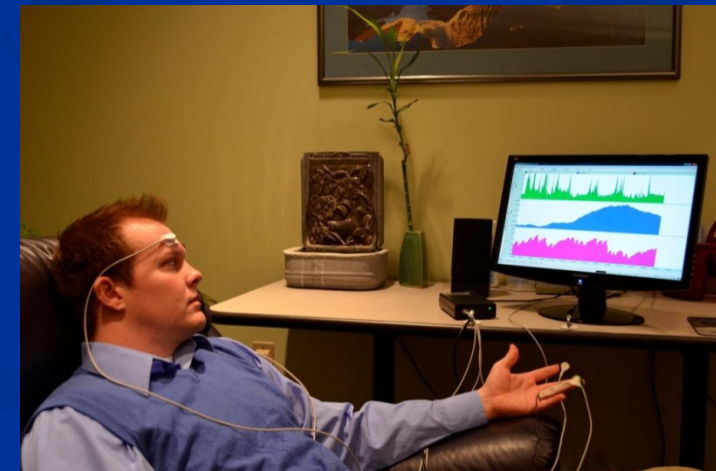
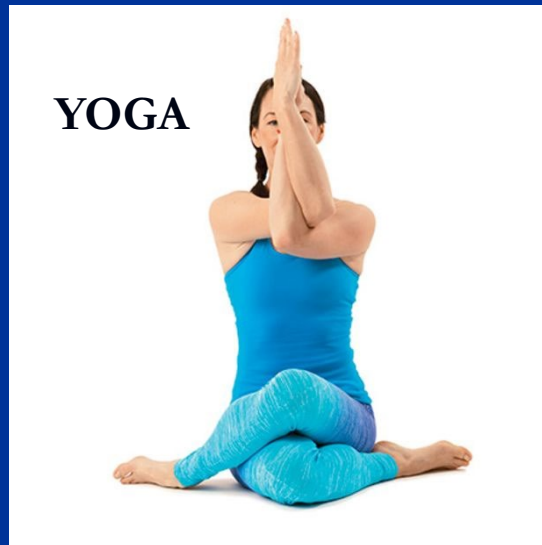


Using Cognition to alter pain perceptions

# Reframing



# The Relaxation Response



ERASE

## Actions



Using Behavior to alter pain perceptions and  
provide a foundation of wellness

# Exercise

- 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



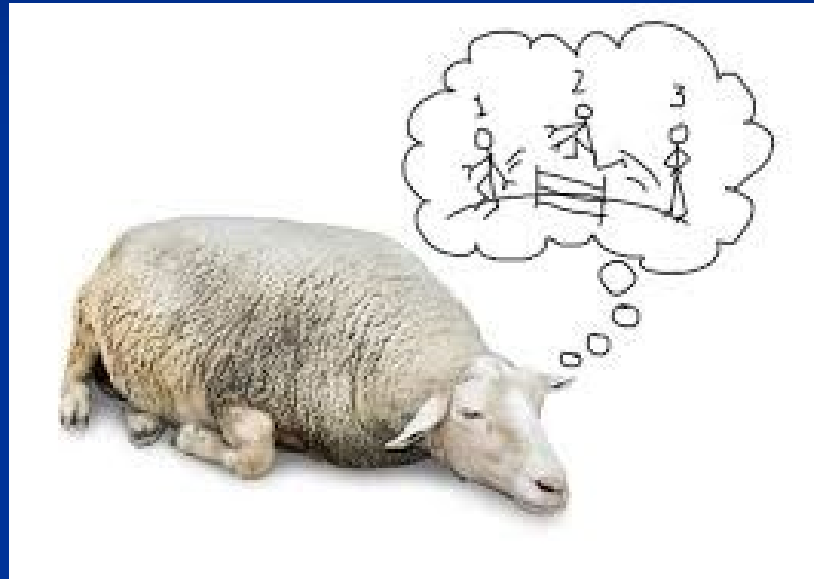
# Pacing for Energy Efficiency



# Problem Solving / Goal Setting



# Sleep



Altering Pain via Sleep

# Behavioral and Sleep Hygiene Skills

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## 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



Friends



Family



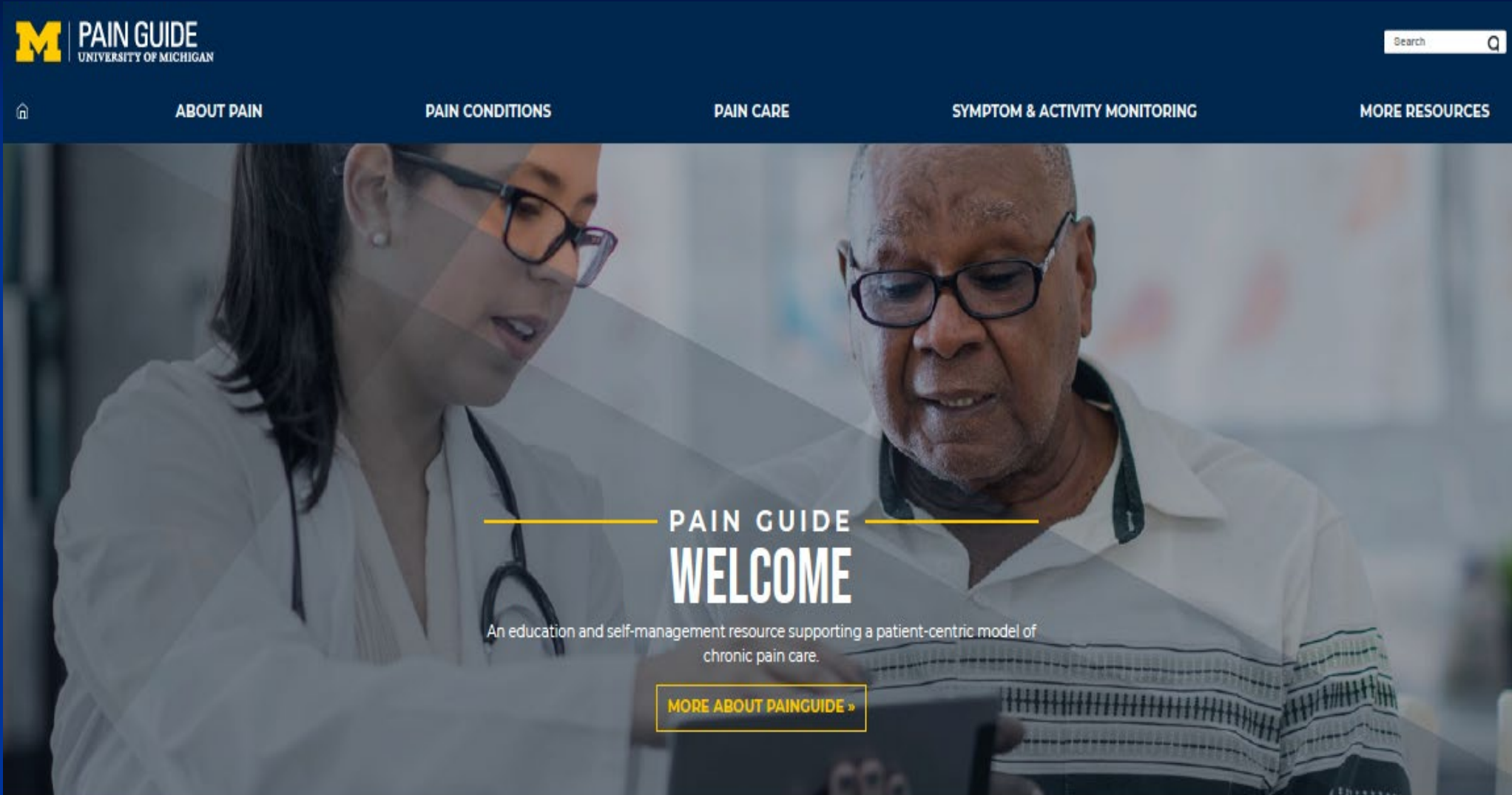
Employer and co-workers

# Physical Challenges





# Web-based self-management



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**PAIN GUIDE**  
**WELCOME**

An education and self-management resource supporting a patient-centric model of chronic pain care.

[MORE ABOUT PAINGUIDE »](#)

<http://PainGuide.com>

## Self Care



### Exercise

Exercise, when done safely, can benefit you physically and mentally. It helps prevent deconditioning of muscles which is often associated with more pain. Studies find that exercise is one of the most beneficial approaches to managing pain.

[Learn more >](#)



### Pacing

People with pain often "over do" resulting in pain flare ups. Pacing can allow activities to get accomplished safely, without flare-ups, and in a manner that conserves energy (i.e., with less fatigue).

[Learn more >](#)



### Nutrition & supplements

Eating a healthy diet has many benefits for everyone, however there may be some specific benefits for pain sufferers. The examination of pain and diet is an emerging literature.

[Read nutrition & supplements tips >](#)



### Relaxation

Teaching the body to relax can both diminish muscle tension and decrease stress. To work properly, regular practice is needed so that the body learns a rhythm of relaxation and can relax on your command. Less tension and less stress can lead to decreased pain intensity.

[Learn more >](#)



### Reframing

What we think influences how we feel and how much pain we experience. Sometimes negative thoughts become automatic and make us feel worse. Learning to reframe our thinking in realistic terms that challenge negative automatic thinking can help diminish pain intensity.

[Learn more >](#)



### Managing Emotions

Emotions are integral to the production of pain. You cannot have pain without emotions. Thus anything we can do to alter the emotional content of one's brain will influence pain. Better management of stress can influence pain as well as engaging in pleasant activities. The pleasant activities will help diminish pain intensity.

[Learn more >](#)



### Communication skills

Conflictual social relationships with family, friends, doctors, and employers can make pain worse. Alternatively, these same relationships can be used constructively to make pain better. Communication skills can help make social relationship work in your favor.

[Learn more >](#)



### Sleep

Pain and Sleep are closely related such that poor sleep can make pain worse. These are a number of behavioral sleep strategies that can be used to get a more refreshing night's sleep.

[Learn more >](#)



### Acupressure

Like acupuncture, which uses needles, acupressure is an ancient treatment that uses the pressure of one's own finger on the skin so as to help re-balance the flow of energy through the body as a means of reducing symptoms such as pain.

[Learn more >](#)



### Spirituality

The belief in something "bigger," "more powerful," or "more knowledgeable" than oneself has been key to many individuals being able to successfully deal with pain. Spirituality may refer to a specific religious belief or it can be any belief that provides a source of strength and comfort to the individual with pain.

[Learn more >](#)



### Ergonomics/Posture

How you sit, stand, transition and lift can either make pain worse or allow you to function even with pain. This section offers help in optimizing how you interact with your environment in ways that don't exacerbate pain.

[Learn more >](#)



### Resilience

We often focus on fixing what is broken but we can't lose sight of our personal strengths that help us get through challenging times. Finding our sources of resilience can be a valuable tool for reducing pain and living a quality-filled life.

[Learn more >](#)

## SYMPTOMS

Sleep

Pain

**Affect**

Cognitive Function

Energy / Fatigue

## BEHAVIORS

Physical Activity

Pacing

Self-care Worksheets

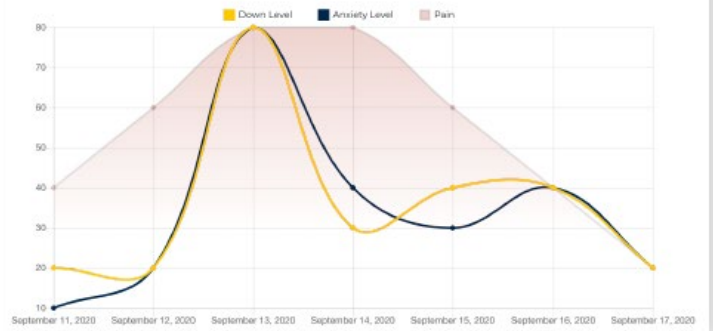
## AFFECT

Week

Month

Custom

September 11, 2020 - September 17, 2020



September 17, 2020

September 16, 2020

## PAIN CARE

### Self Care

### Professional Care

Medications

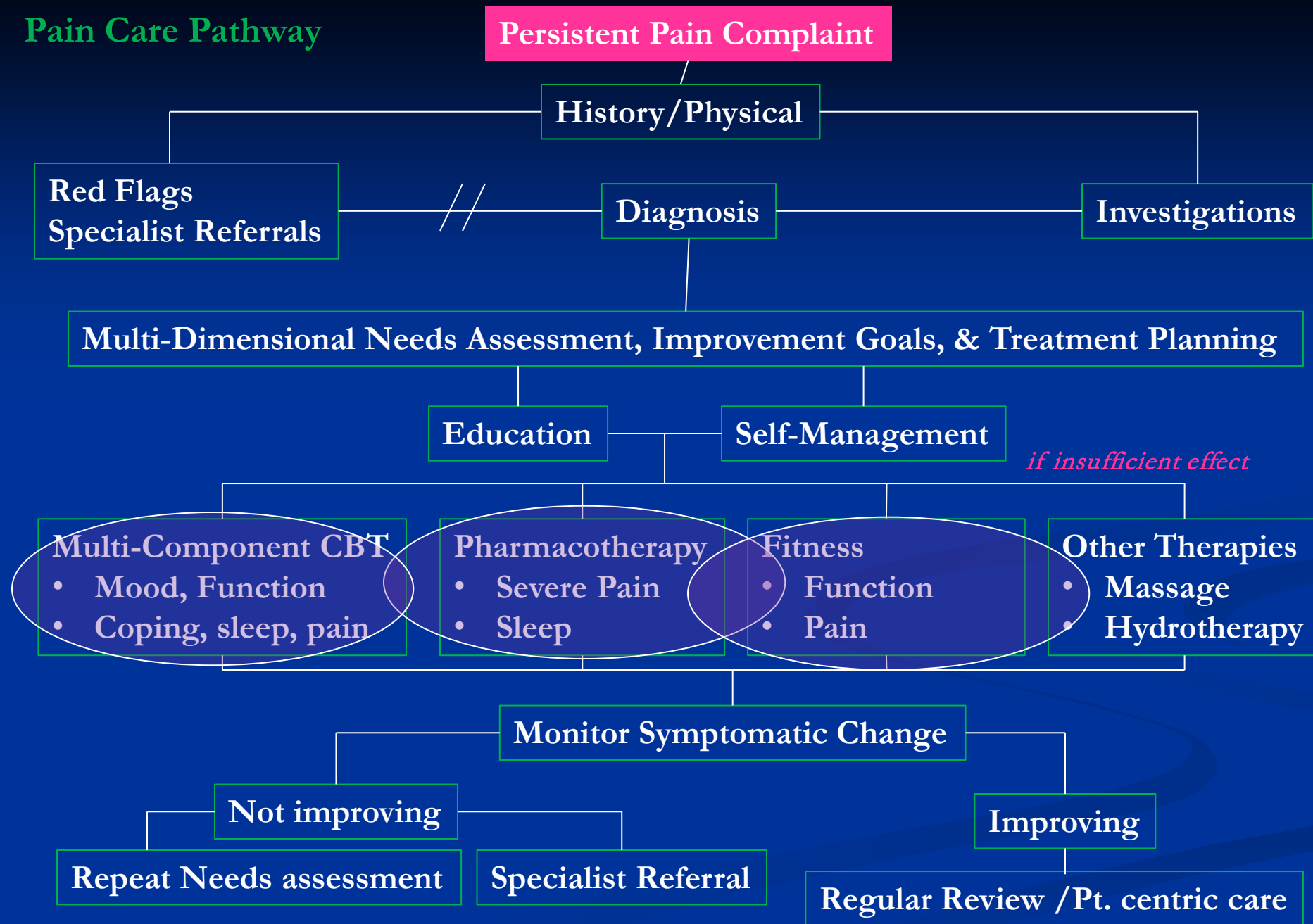
Therapies

Devices

Procedures



# Pain Care Pathway



# Pharmacological Therapies for Central Pain States

<b>Strong Evidence</b>	<ul style="list-style-type: none"><li>■ Dual reuptake inhibitors such as<ul style="list-style-type: none"><li>■ Tricyclic compounds (amitriptyline, cyclobenzaprine)</li><li>■ SNRIs and NSRIs (milnacipran, duloxetine, venlafaxine?)</li></ul></li><li>■ Anticonvulsants (e.g., pregabalin, gabapentin)</li></ul>
<b>Modest Evidence</b>	<ul style="list-style-type: none"><li>■ Tramadol</li><li>■ Older less selective SSRIs</li><li>■ Gamma hydroxybutyrate</li><li>■ Low dose naltrexone</li><li>■ Cannabinoids</li></ul>
<b>Weak Evidence</b>	<ul style="list-style-type: none"><li>■ Growth hormone, 5-hydroxytryptamine, tropisetron, S-adenosyl-L-methionine (SAME)</li></ul>
<b>No Evidence</b>	<ul style="list-style-type: none"><li>■ Opioids, corticosteroids, nonsteroidal anti-inflammatory drugs, benzodiazepine and nonbenzodiazepine hypnotics, guanifenesin</li></ul>

# Non-Pharmacological Therapies for Chronic Pain States

<b>Strong Evidence</b>	<ul style="list-style-type: none"><li>■ Education</li><li>■ Aerobic exercise</li><li>■ Cognitive behavior therapy</li></ul>
<b>Modest Evidence</b>	<ul style="list-style-type: none"><li>■ Strength training</li><li>■ Hypnotherapy, biofeedback, balneotherapy</li></ul>
<b>Weak Evidence</b>	<ul style="list-style-type: none"><li>■ Acupuncture, chiropractic, manual and massage therapy, electrotherapy, ultrasound</li></ul>
<b>No Evidence</b>	<ul style="list-style-type: none"><li>■ Tender (trigger) point injections, flexibility exercise</li></ul>

# Pain Guide

can serve as the foundation for CBT



## Pain Guide

An Online Self-Management Program for  
Individuals with Chronic Pain

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Facilitator's Manual

David A Williams, Ph.D.  
Professor, University of Michigan

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# 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.