

Pain Management: Rationale for the BioPsychoSocial Perspective

MI-CCSI

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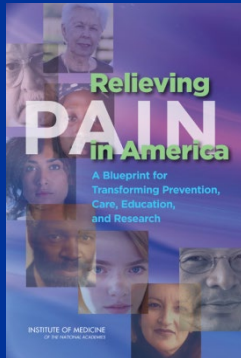
Ann Arbor, Michigan

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

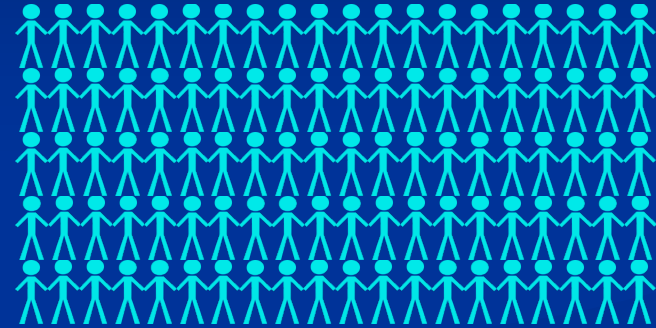


150 Million
- 37 Countries

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



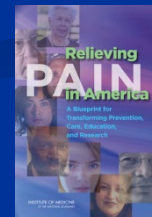
Heart Disease 27.6 Million



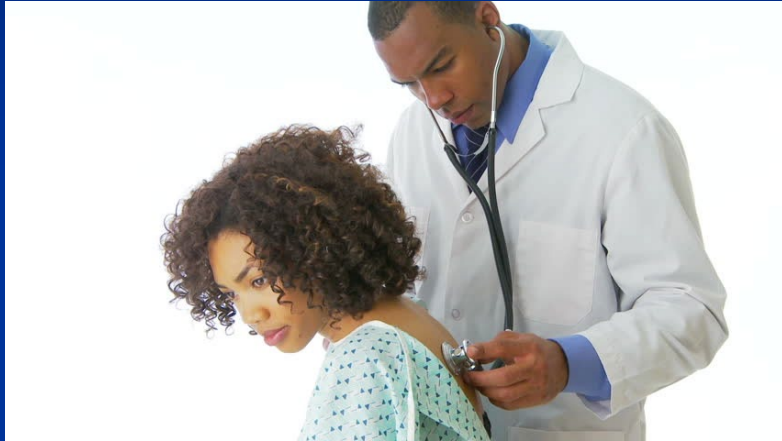
Cancer 13.7 Million



 = 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

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
- 87% of patients were unwilling to try non-pharmacological treatment

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,[†] Luana Colloca, MD, PhD,[‡] Levente Kriston, PhD,[§] Klaus Linde, MD, PhD,[¶] Bruce Moseley, MD,^{||} and Karin Meissner^{||,**,§}

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

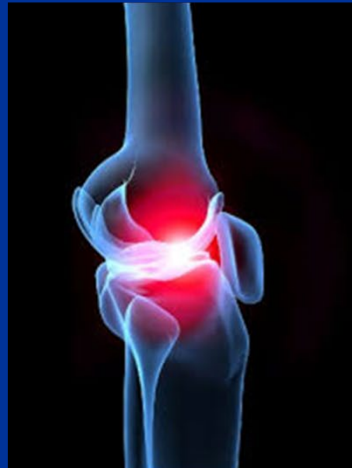


How is Pain Classified?

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

Newest Classification: Pain Mechanisms

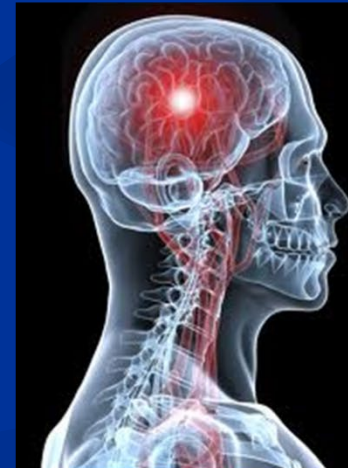
Nociceptive
Peripheral damage
or inflammation



Neuropathic



Central



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

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

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

Mechanisms of Pain

**Nociceptive
and
Inflammatory**

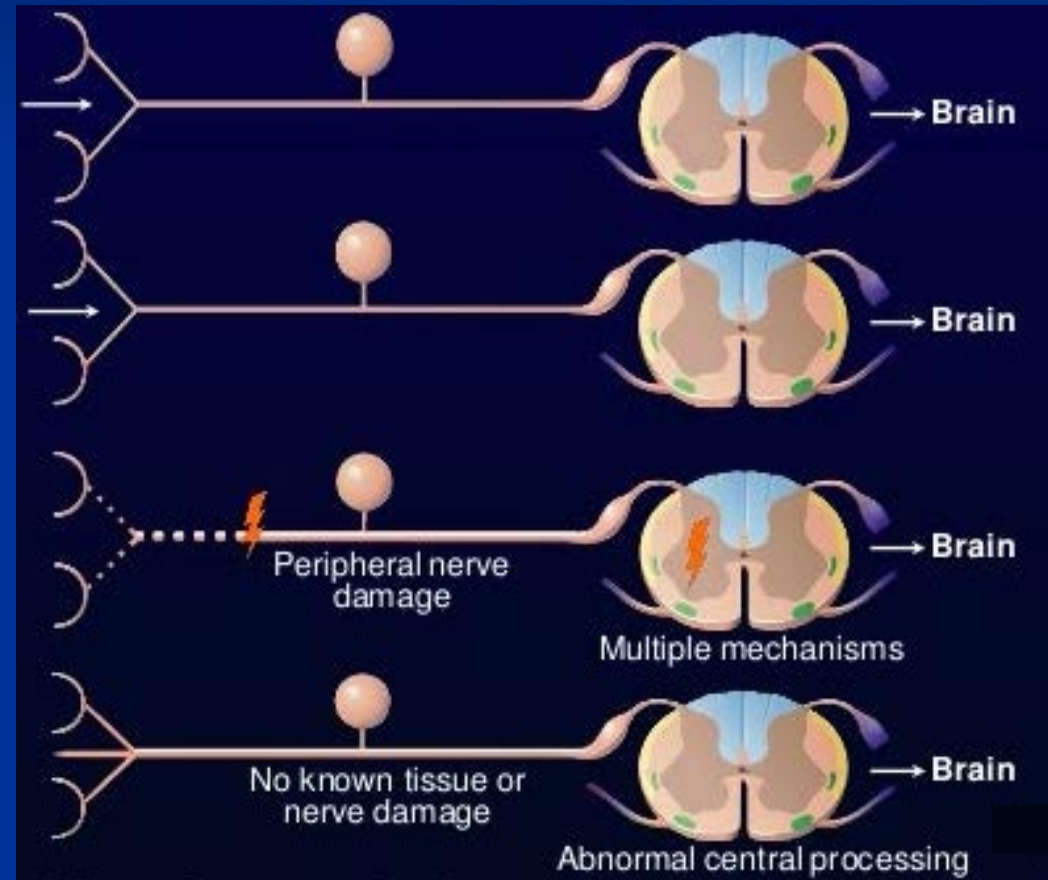
Noxious
Peripheral Stimuli

Inflammation

Neuropathic

Peripheral or
Central damage

Centrally Driven Pain



Mechanisms of Pain

**Nociceptive
and
Inflammatory**

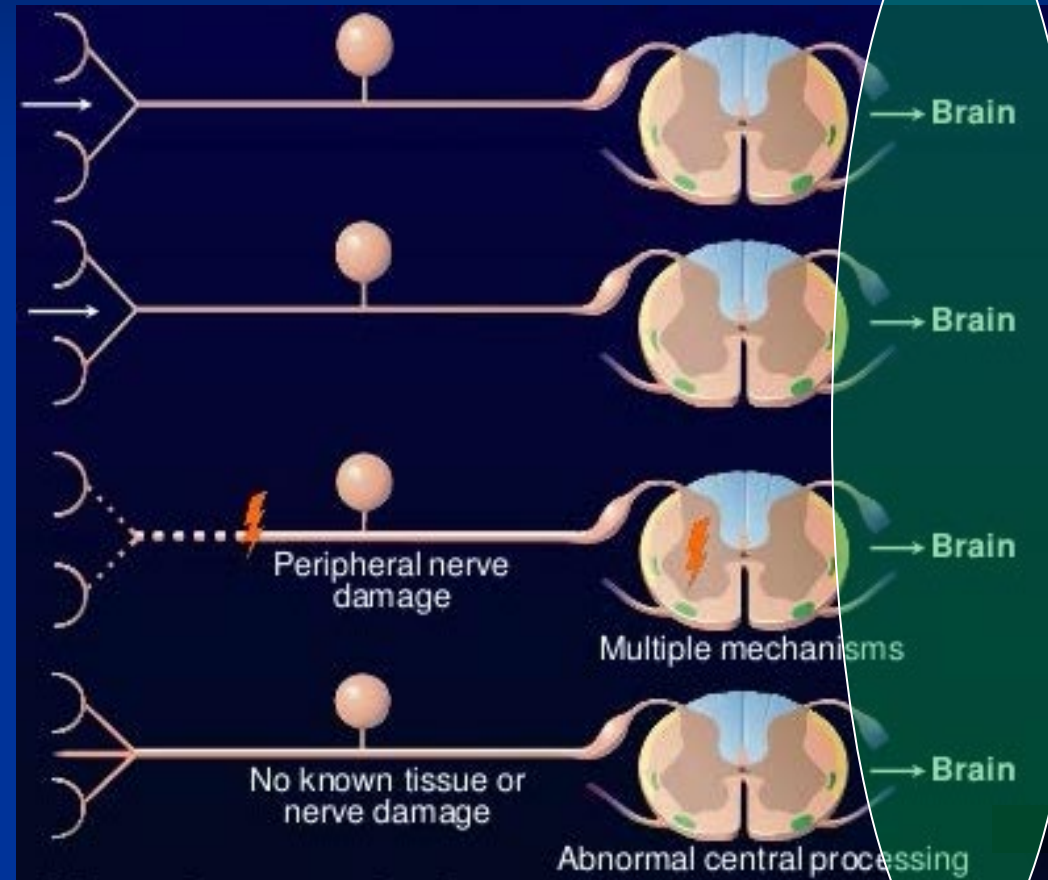
Noxious
Peripheral Stimuli

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

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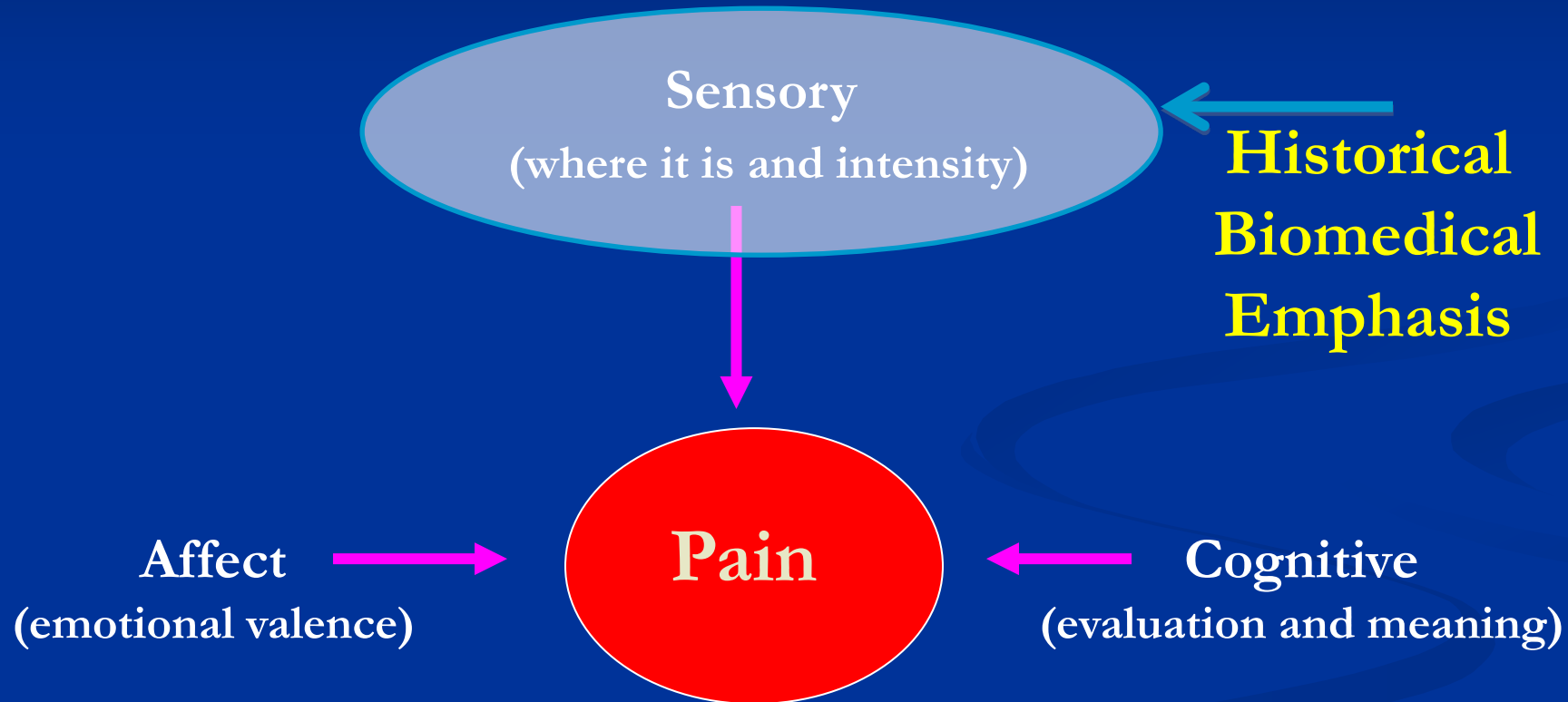
■ Affective / Cognitive dimensions

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

I still feel
pain

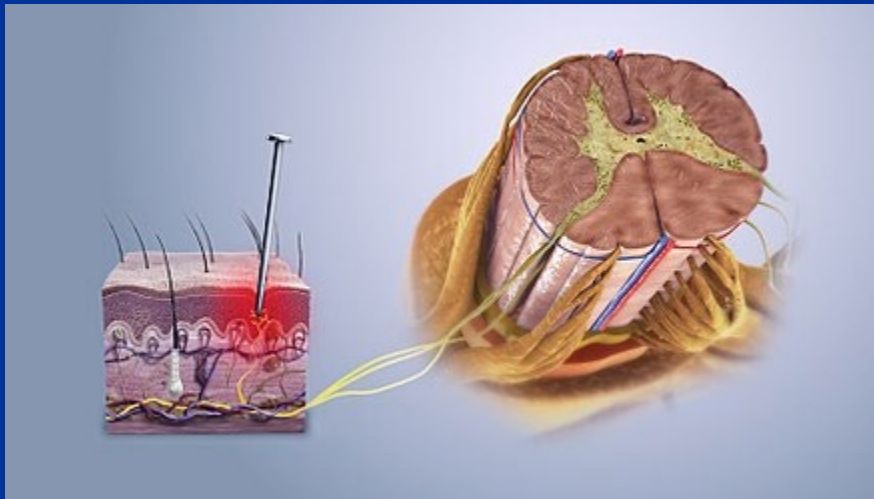


Chronic Pain has Three Components: The BioMedical Model Focuses on 1 of Them

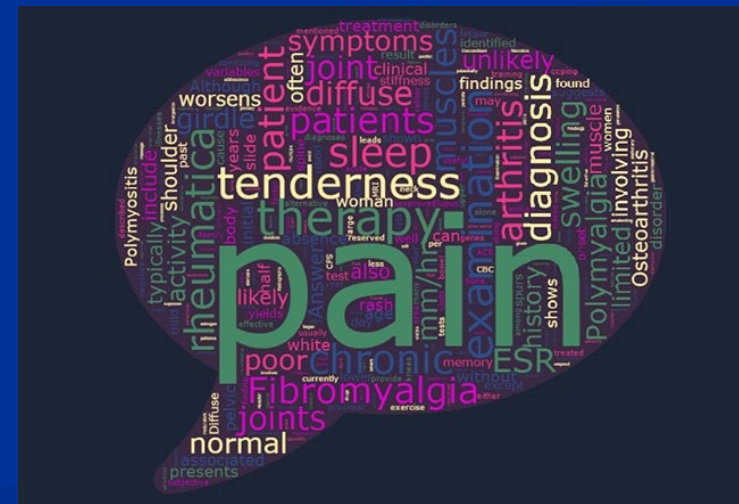


Thinking Differently about Pain

- 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 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

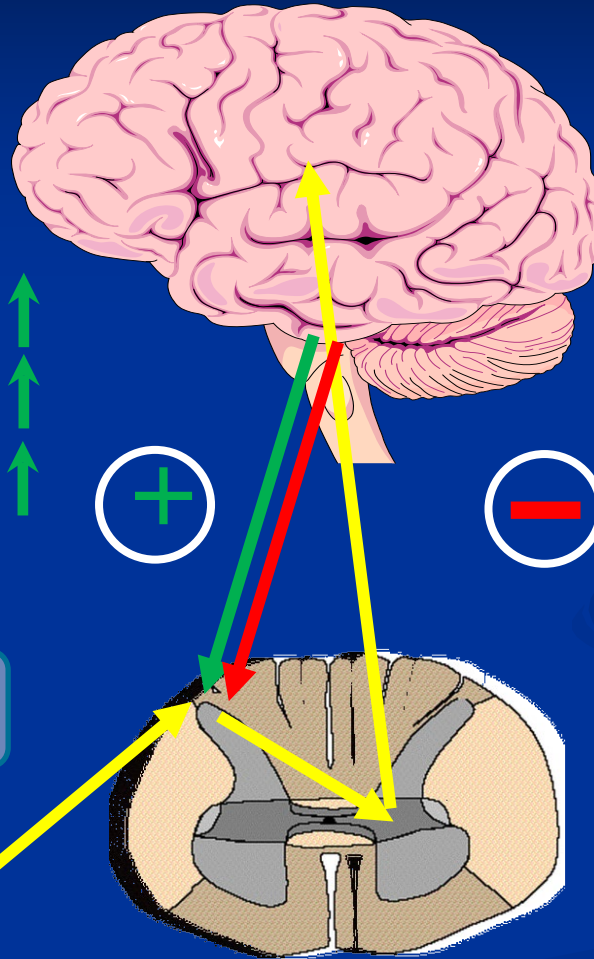
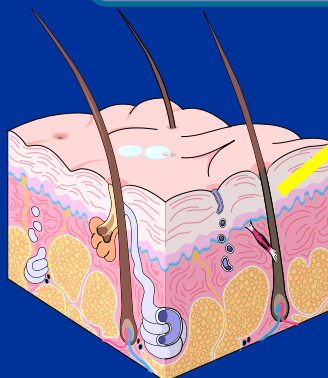
Influencing Pain

Facilitation

Glutamate and EAA
Substance P
Nerve growth factor
Serotonin (5HT_{2a, 3a})

Gabapentinoids,
ketamine

Anti-migraine drugs (–
triptans),
cyclobenzaprine



Inhibition

Descending anti-nociceptive pathways

Norepinephrine-serotonin (5HT_{1a,b}),
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

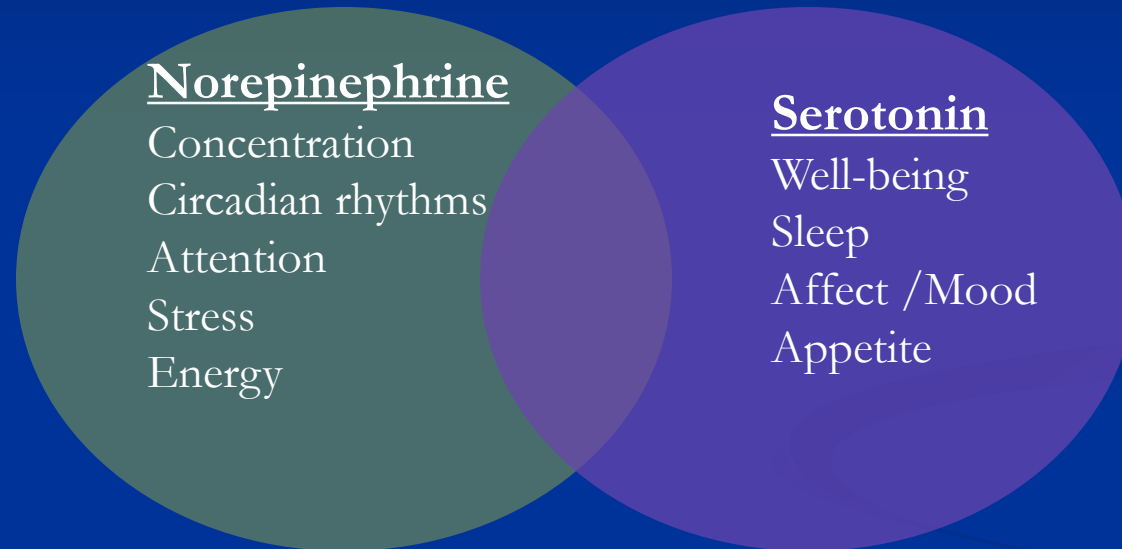
Circadian rhythms

Attention

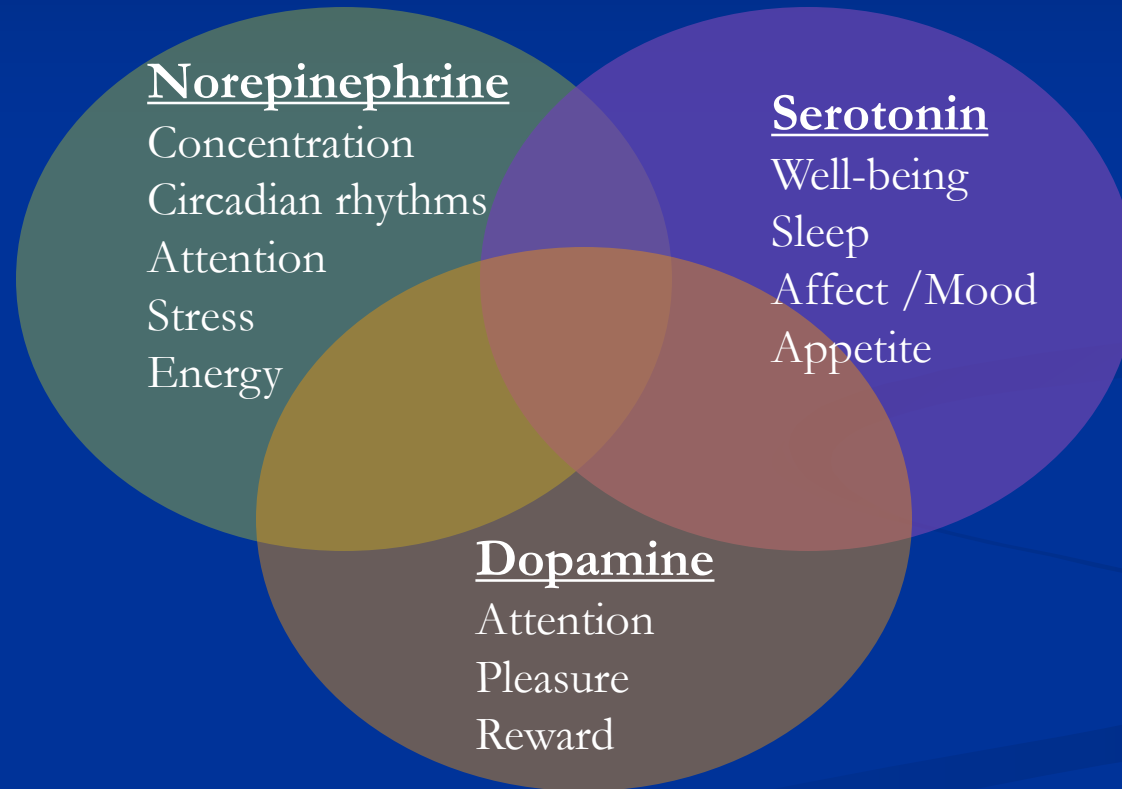
Stress

Energy

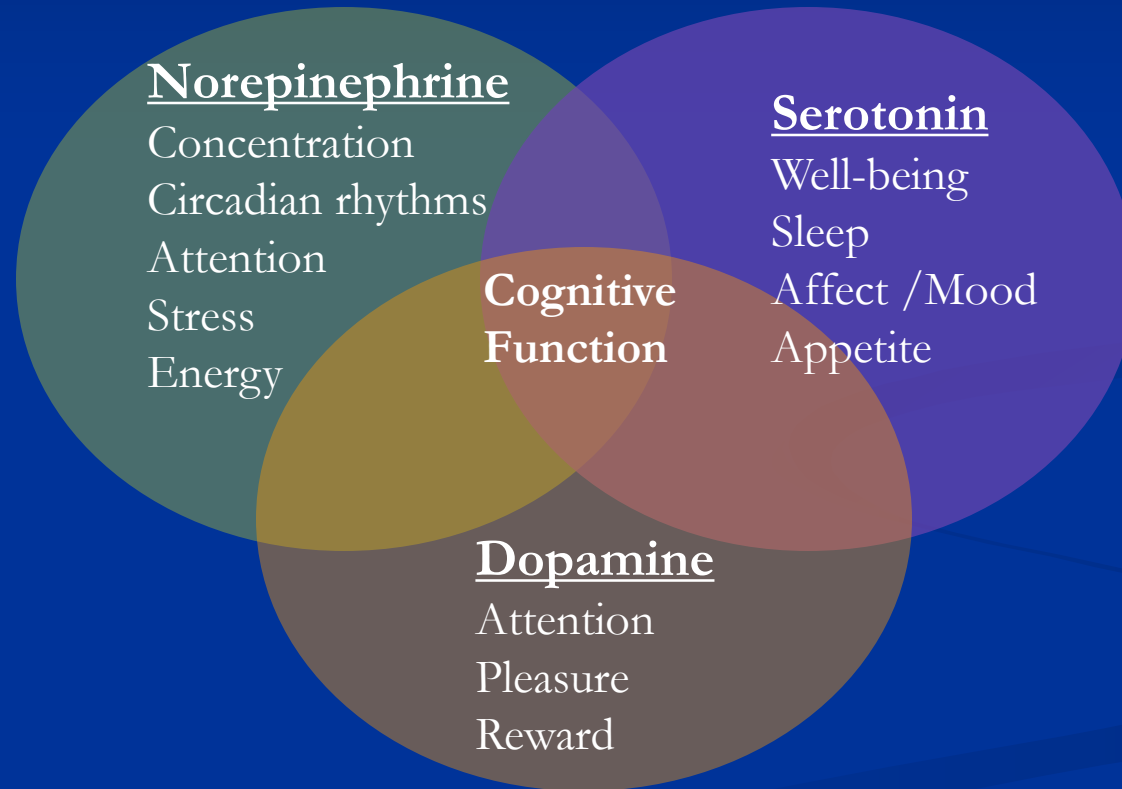
Neurotransmitters for Pain Processing



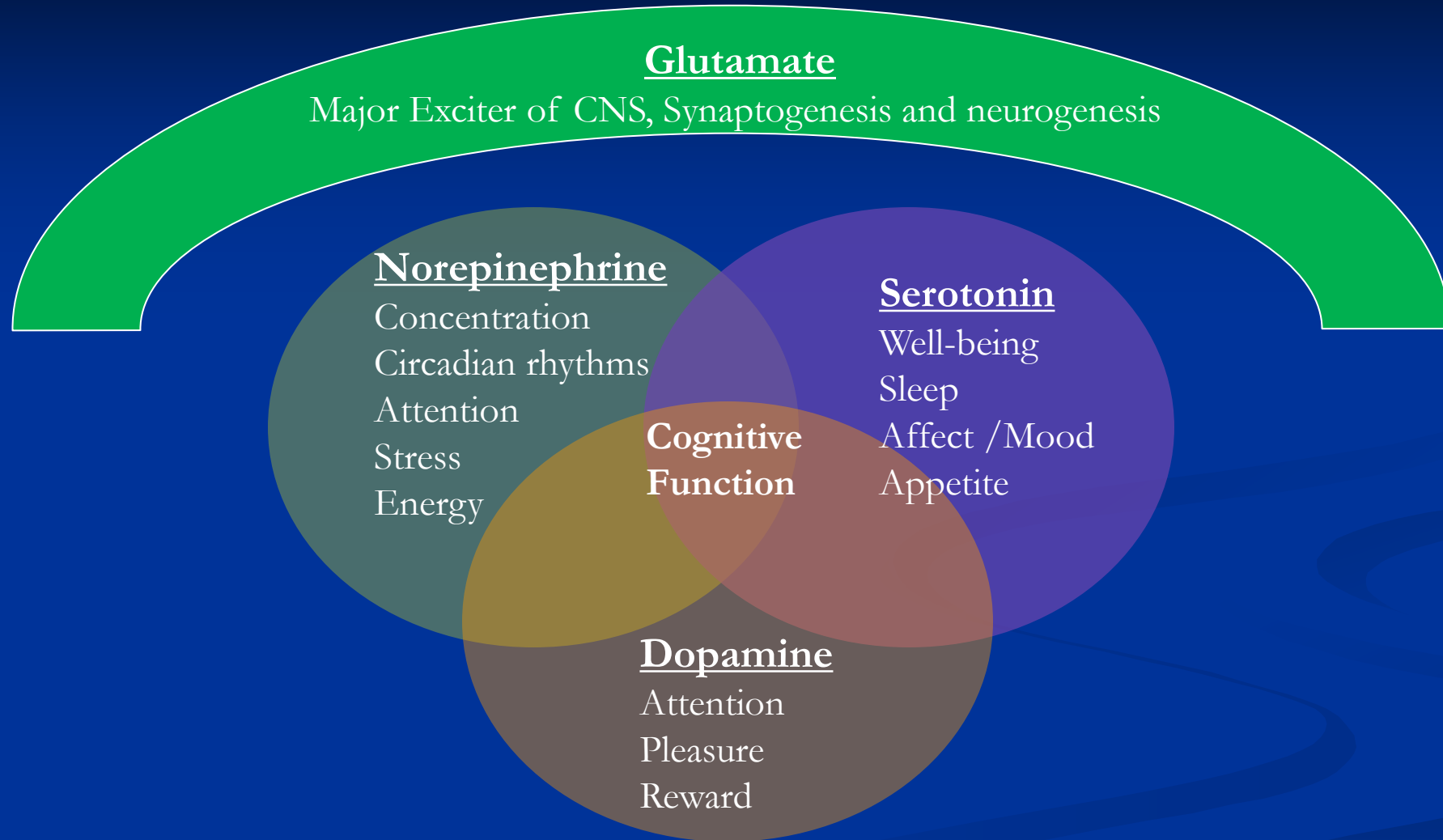
Neurotransmitters for Pain Processing



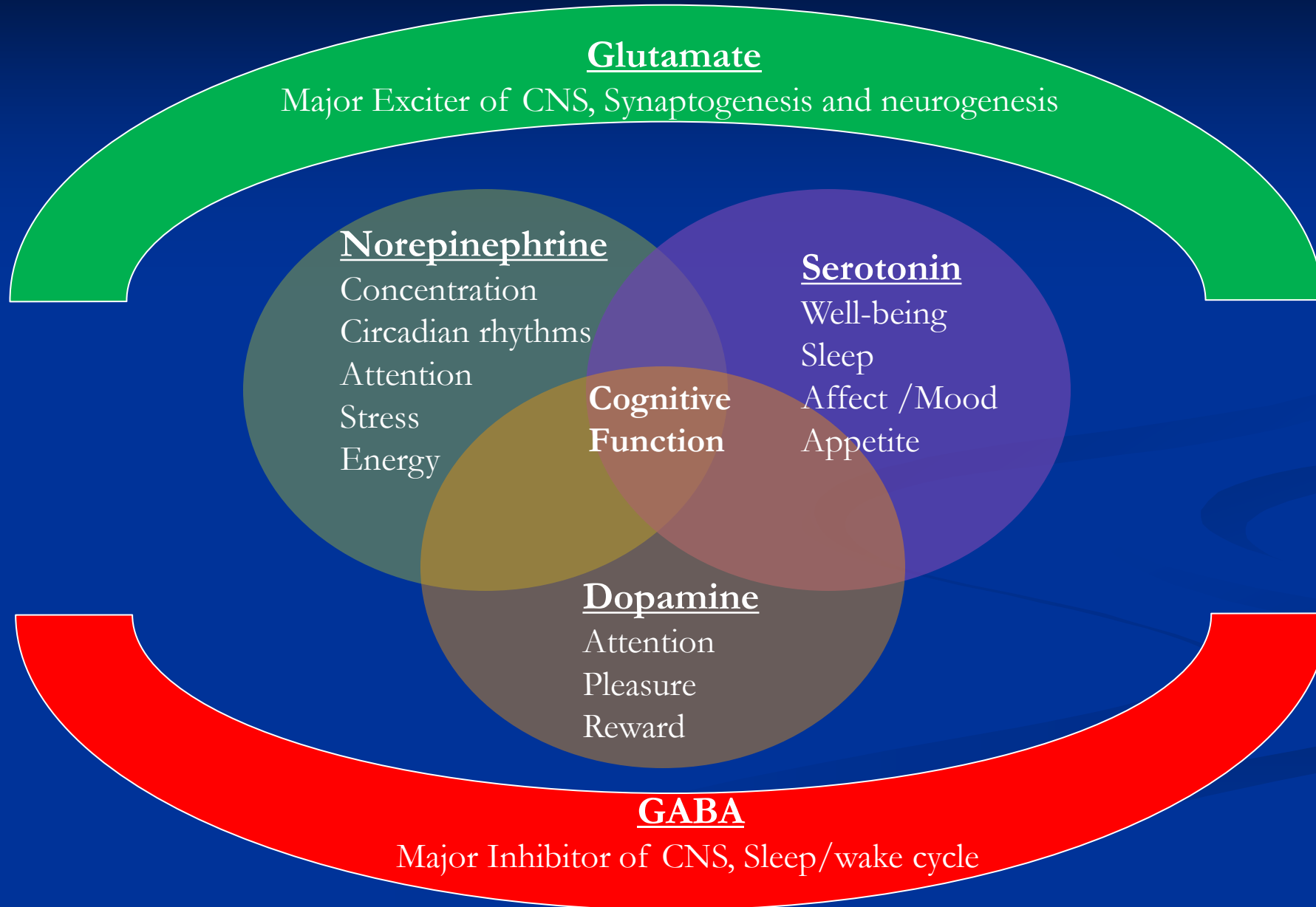
Neurotransmitters for Pain Processing



Neurotransmitters for Pain Processing



Neurotransmitters for Pain Processing



Shared Neurotransmitters Explain

- The complexity of chronic pain presentation

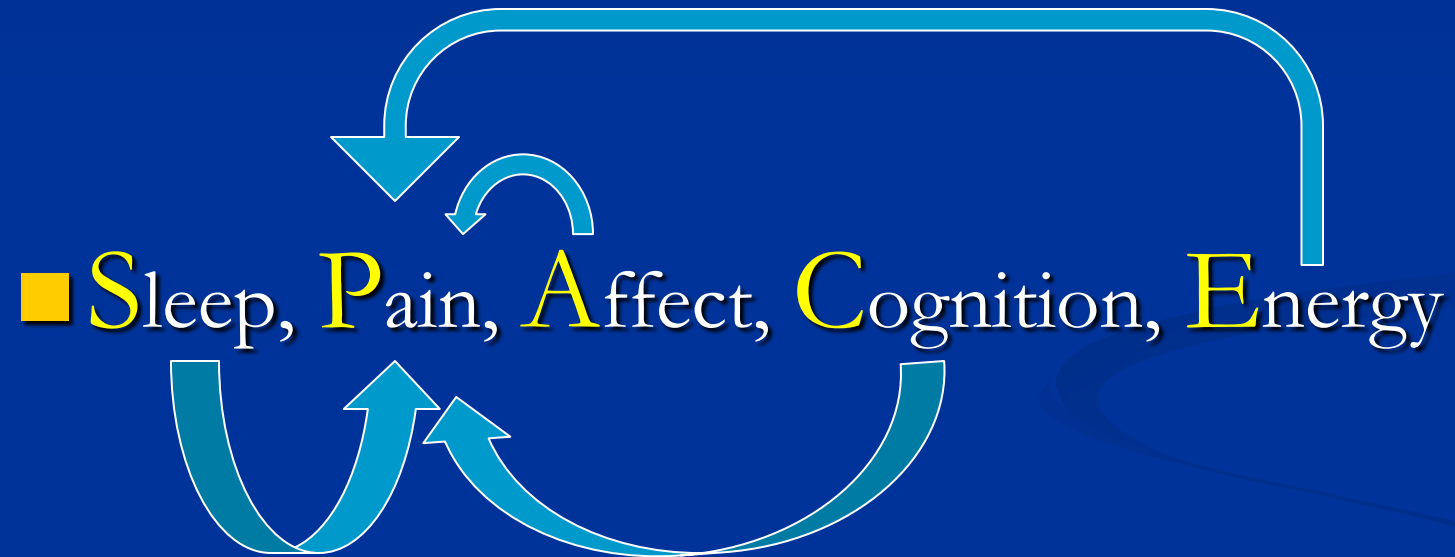
Shared Neurotransmitters Explain

- The complexity of chronic pain presentation



Shared Neurotransmitters Explain

- The complexity of chronic pain presentation



■ Sleep, Pain, Affect, Cognition, Energy

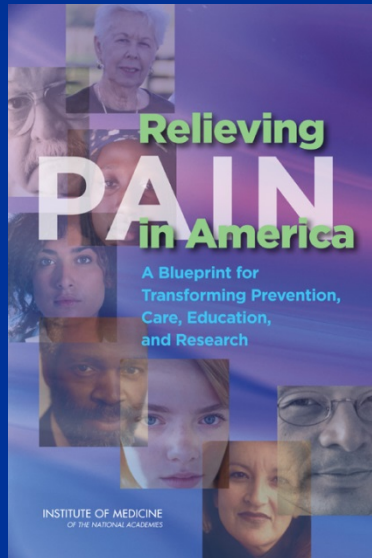
- **SPACE** represents new targets for treating pain perception

So what's a doctor to do?



Recommendations in Multiple Federal Documents

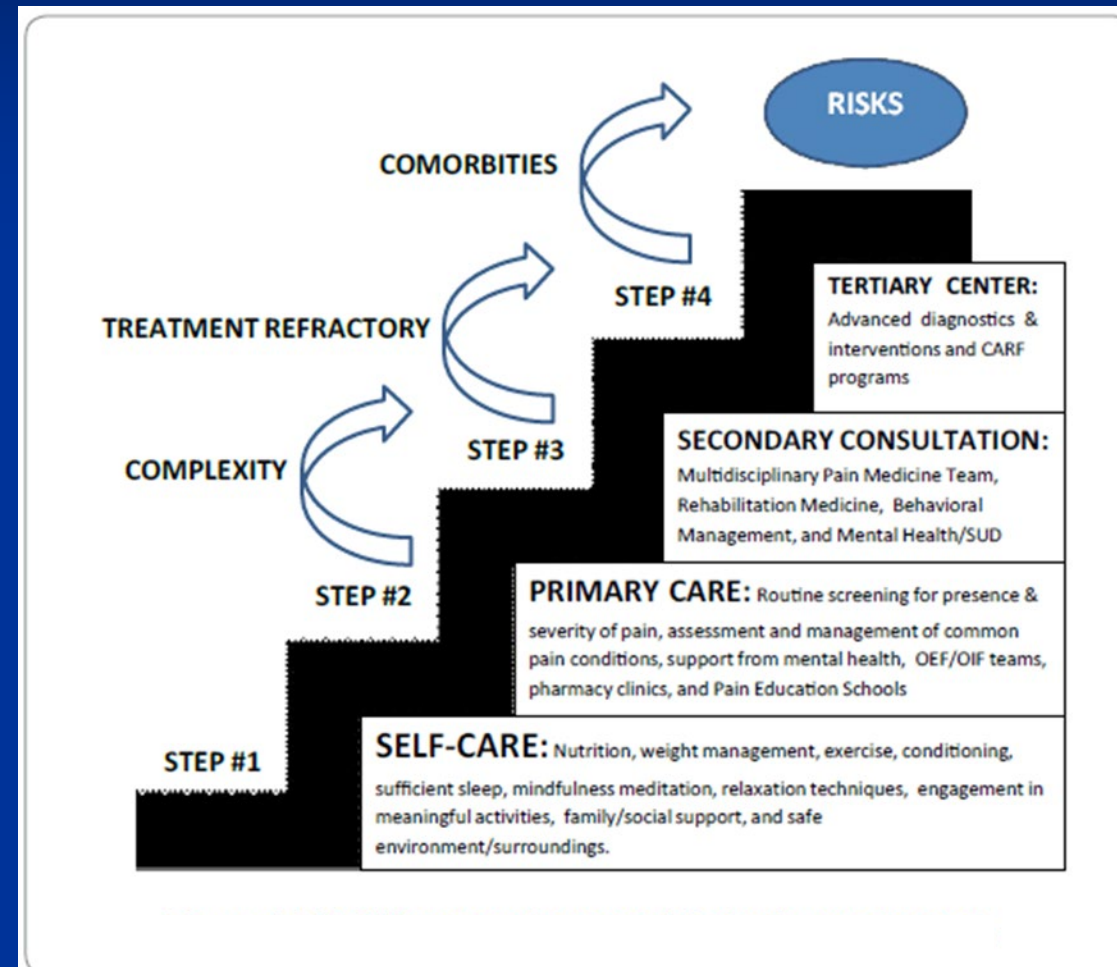
Self-Management, Evidence-Based, Patient-Centric,
Multi-Modal Pain Care



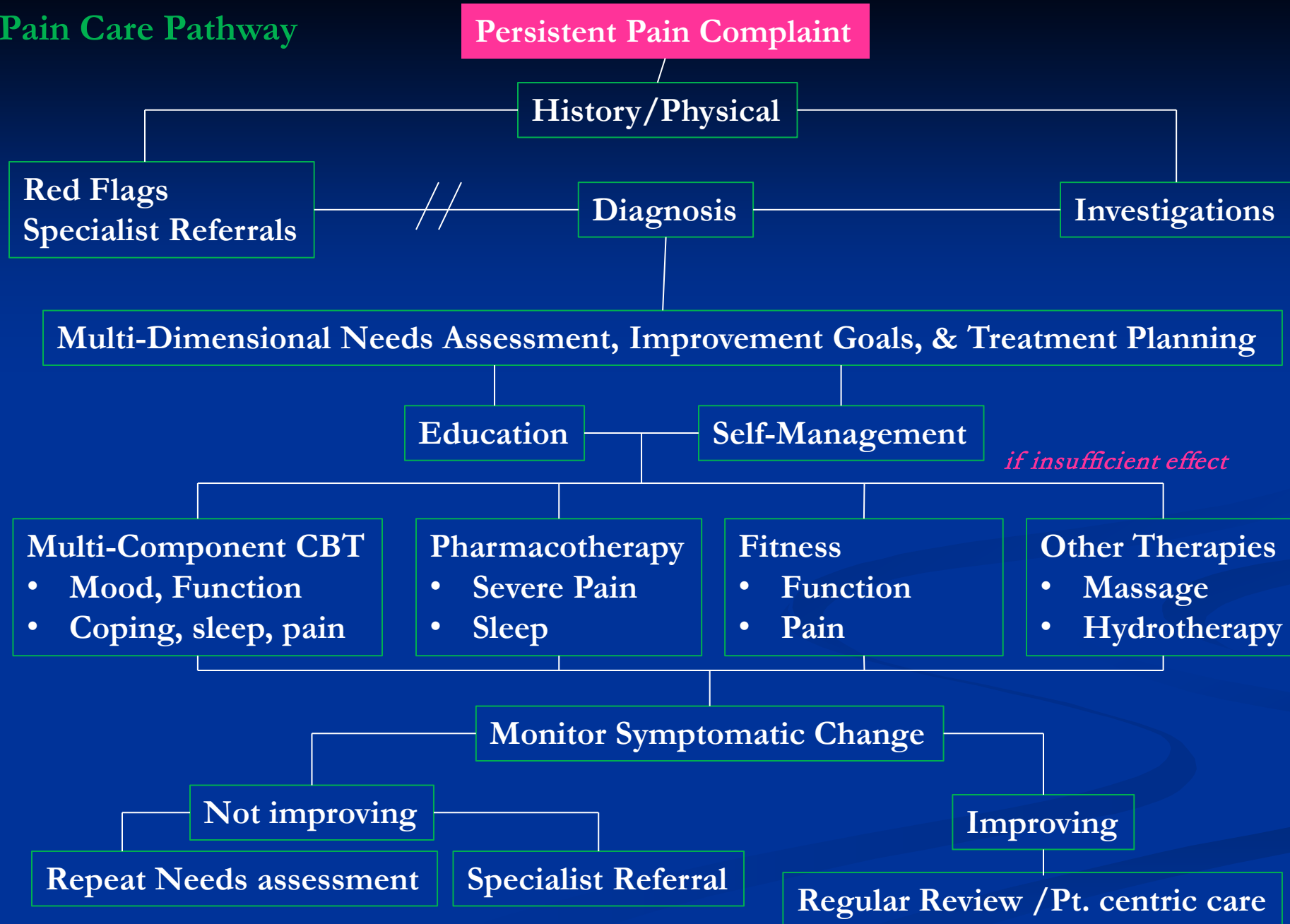
HealthyPeople.gov



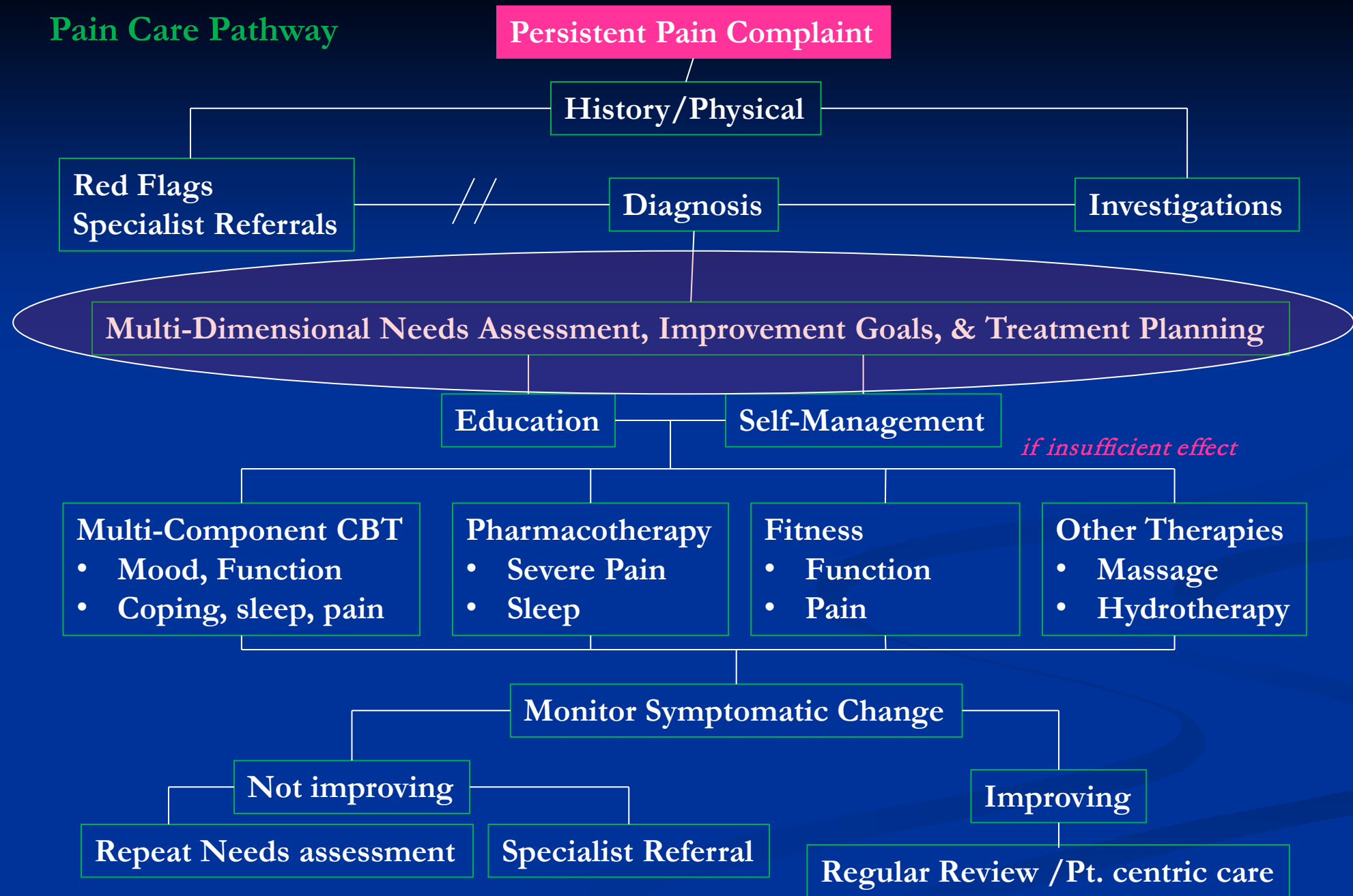
VA's Stepped Care Model of Pain Management



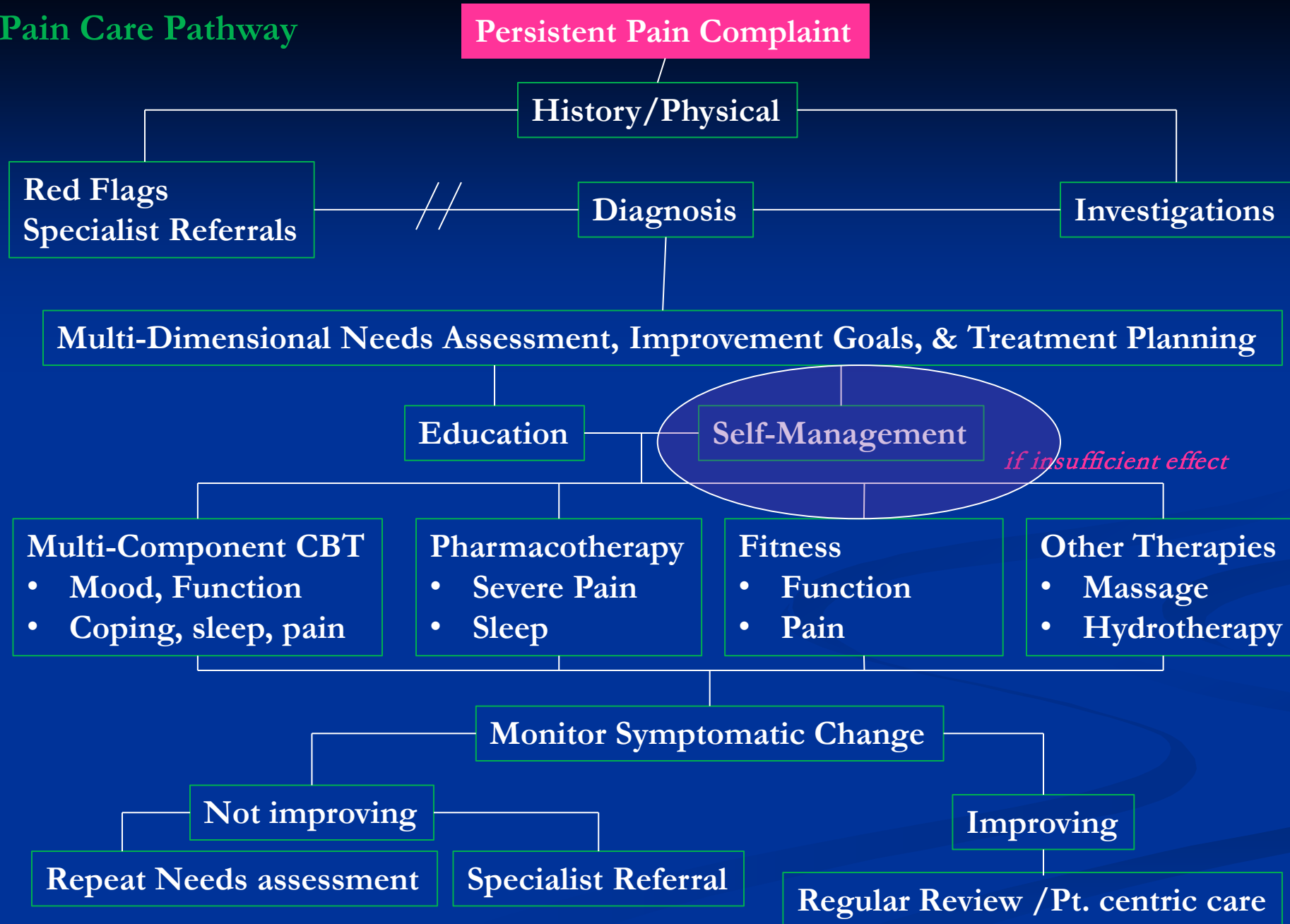
Pain Care Pathway



Pain Care Pathway



Pain Care Pathway



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

Emotions

Reflections

Actions

Sleep

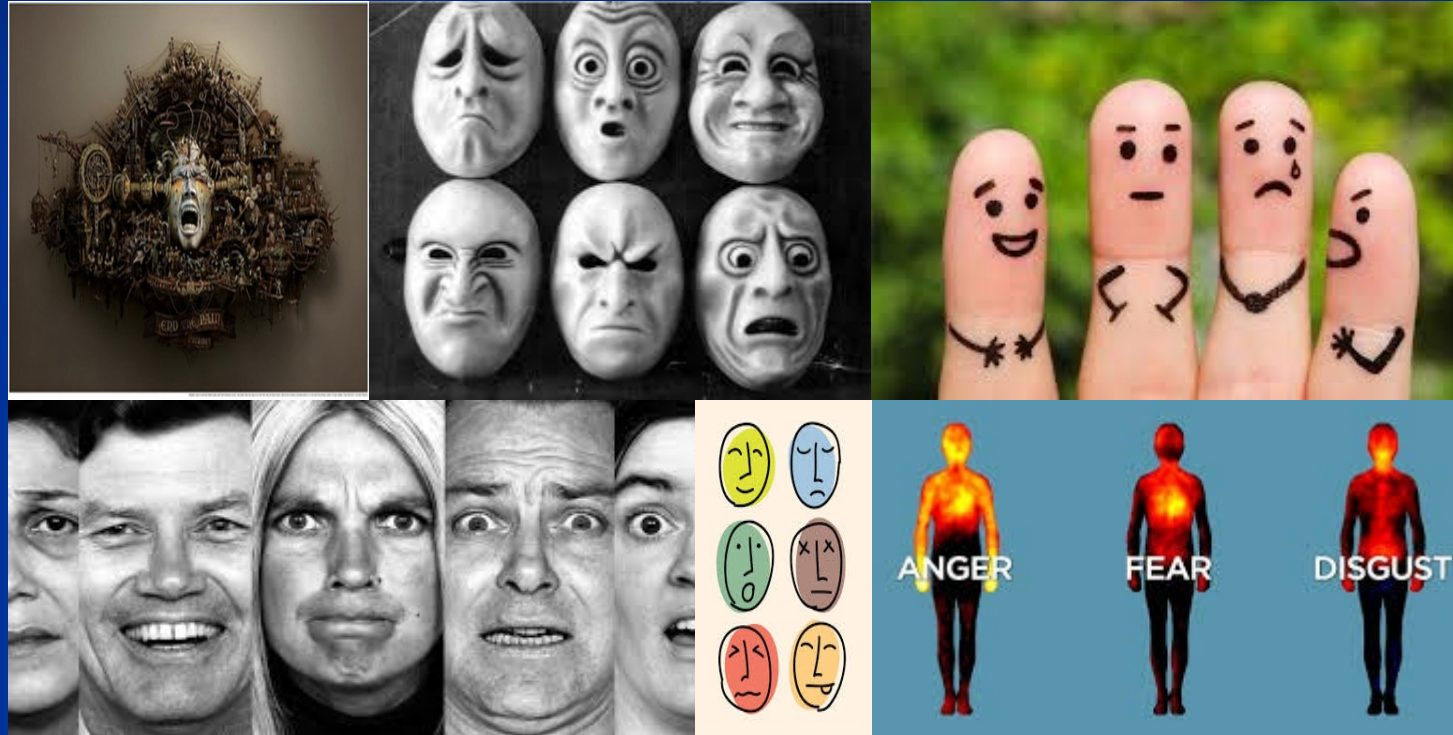
Environment



Sleep, Pain, Affect, Cognitive changes, Energy deficits

ERASE

Emotions



Altering pain perception through Emotions

Psychiatric Co-Morbidities



Psychiatric Co-Morbidity in Chronic Pain

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

Kessler, RC et al (2003). JAMA, 289:3095; Kessler, RC et al (2005). Archives of Gen. Psychiatry, 62:617.
Banks et al, (1996). PsychBull, 119:95.; Eisendrath (1995), Neurology, 45:S26.

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)



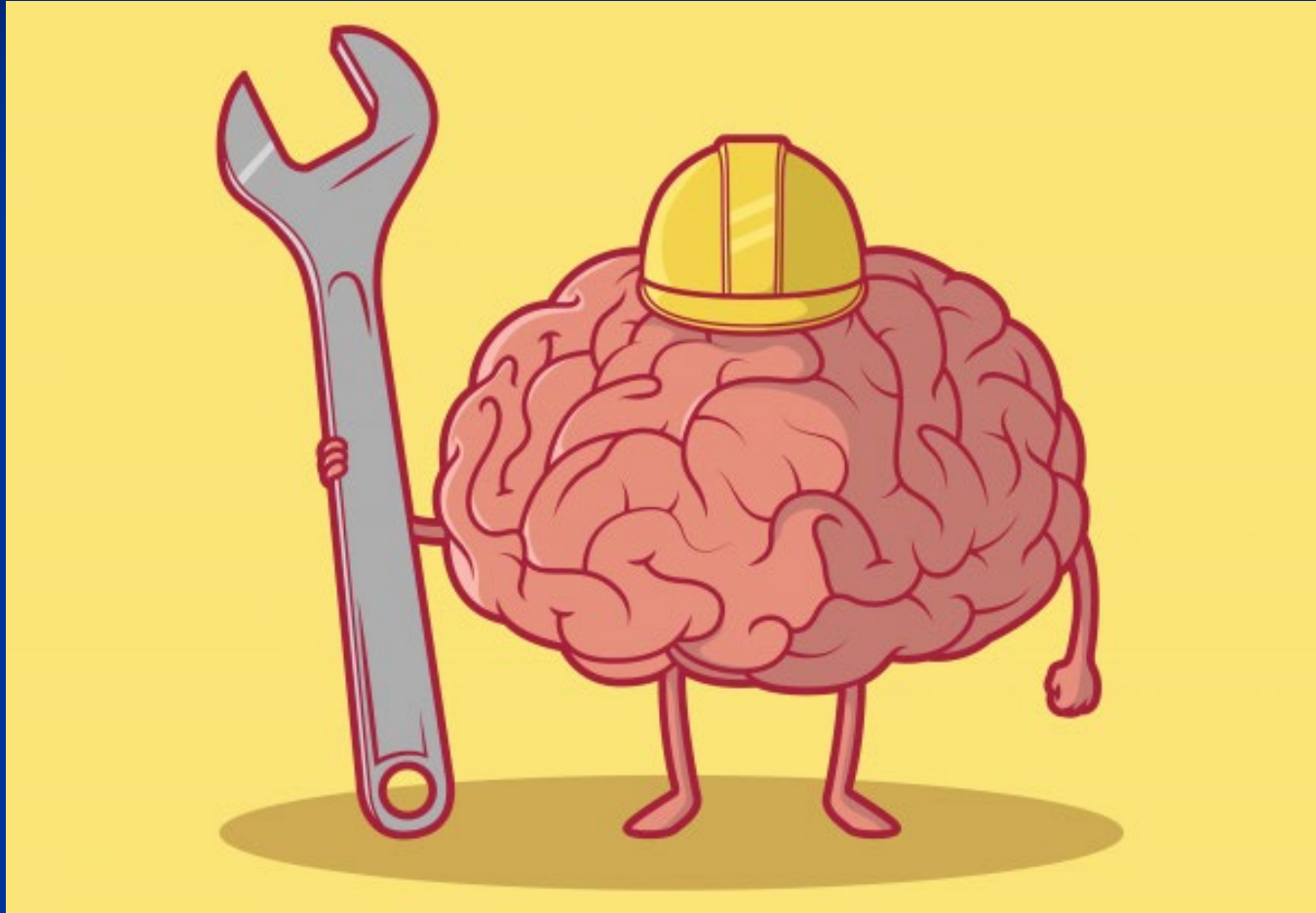
Pleasant Activity Scheduling



Traditional Psychotherapy

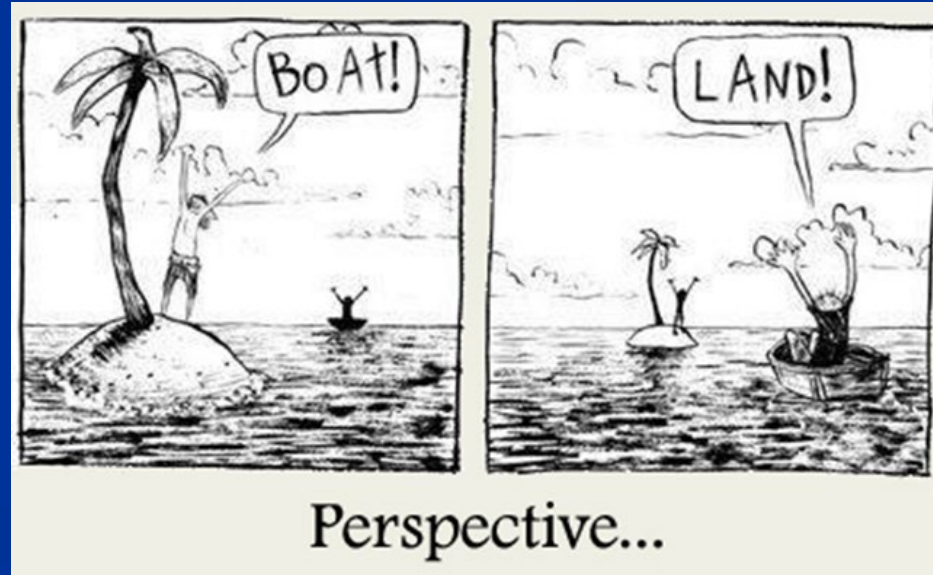
ERASE

Reflections



Using Cognition to alter pain perceptions

Reframing



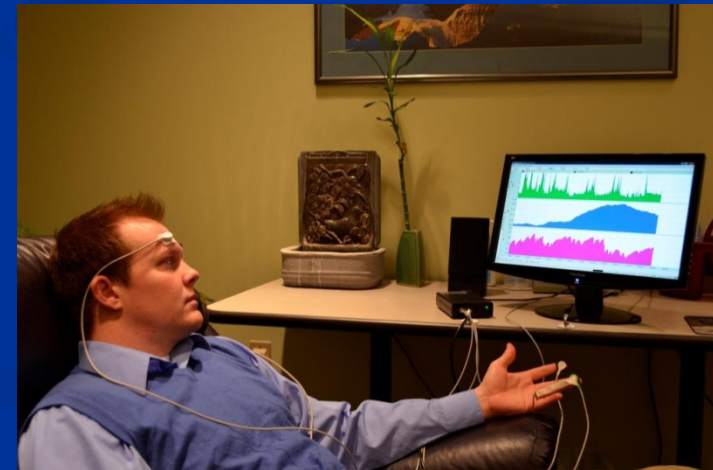
The Relaxation Response



Visual Imagery



Meditation



Biofeedback

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

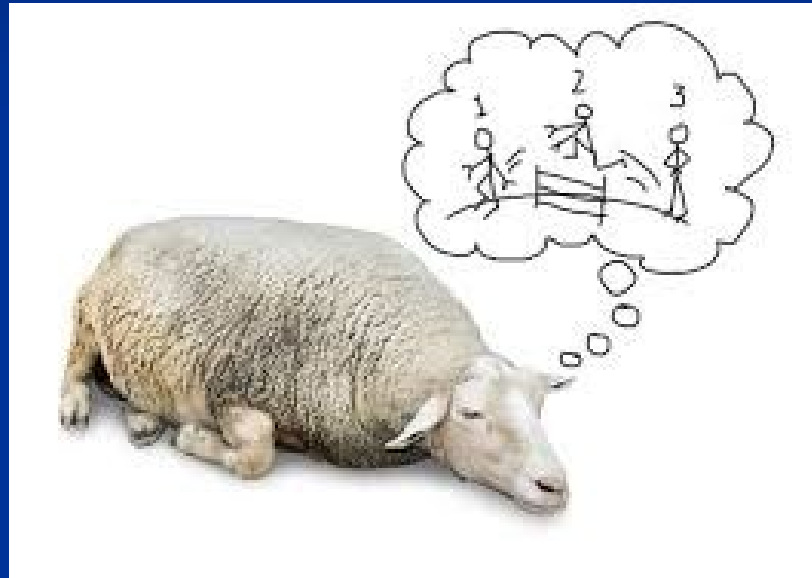


Problem Solving / Goal Setting



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

Environment



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

Social Challenges



Dr. -Patient



Friends



Family

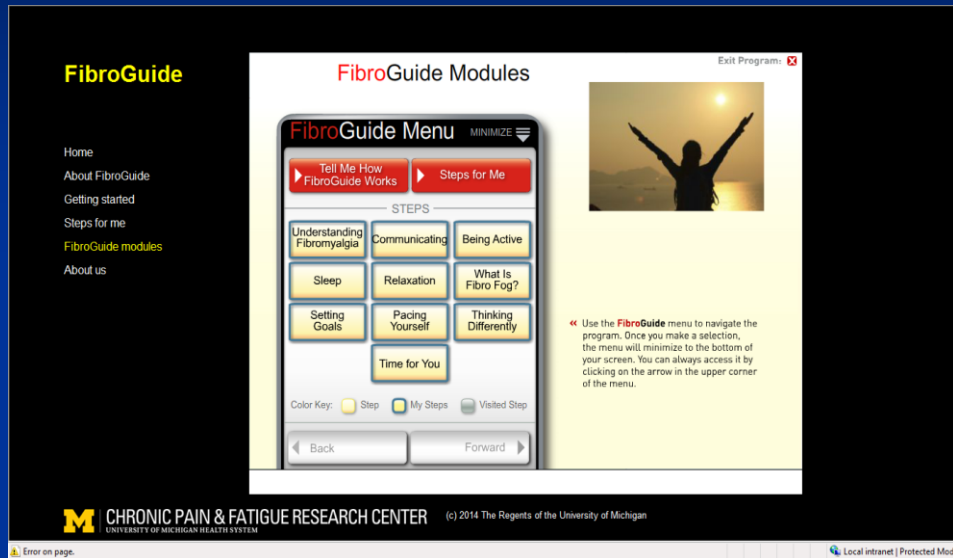


Employer and co-workers

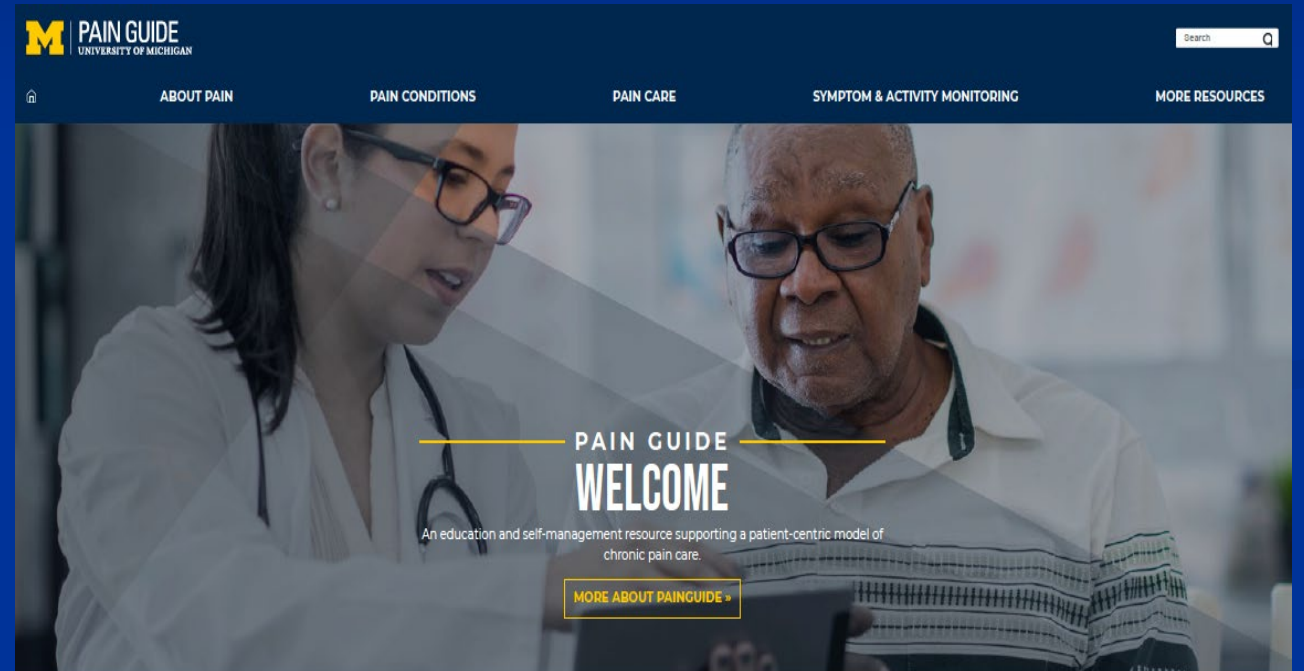
Physical Challenges



Web-based self-management



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



<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



September 17, 2020

September 16, 2020

PAIN CARE

Self Care

Professional Care

[Medications](#)

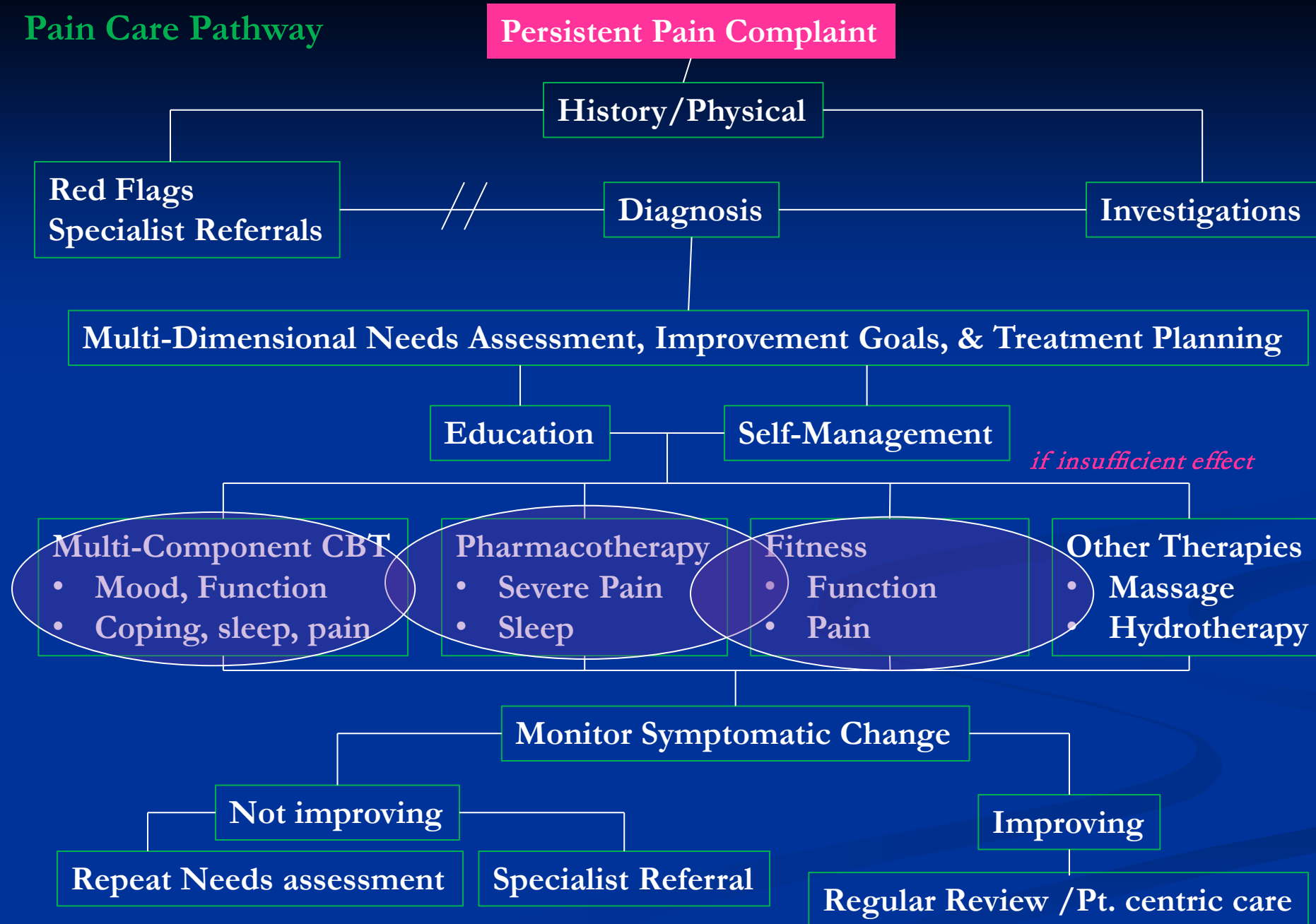
[Therapies](#)

[Devices](#)

[Procedures](#)



Pain Care Pathway



Pharmacological Therapies for Central Pain States

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

Non-Pharmacological Therapies for Chronic Pain States

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

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 FibroGuide.com or FibroGuide.med.umich.edu



Pain Guide

An Online Self-Management Program for
Individuals with Chronic Pain

Facilitator's Manual

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

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.