Myofascial Pain: Patient-Centered Transformative Care to Prevent Chronic Pain and Addiction

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Patient Centered Care

AAPM 2022 38TH ANNUAL MEETING

MINNESOTA HEAD & NECK PAIN CLINIC

PACT
Personalized Activated Care & Training

Disclosure Information
Dr. **James Fricton**
Preventing Chronic Pain

No off label use and/or investigational use of medications

Support from National Institutes of Health and University of Minnesota Clinical Practice, Minnesota Head and Neck Pain Clinic

PACT Program for Self-Management Training of Pain

NIH National Institutes of Health
Office of Extramural Research

HealthPartners®
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In this presentation...

You will be able to understand;

- Prevalence of myofascial pain
- Diagnosis of myofascial pain
- Mechanisms of myofascial pain
- Risk and protective factors for myofascial pain
- Transformative care: Evidenced-based Training with Treatment

Muscle Tissue

Average Body Weight = 70 kg

Skeletal Muscles = 31.5 kg

Muscles are the largest tissue in body- 45% of body weight

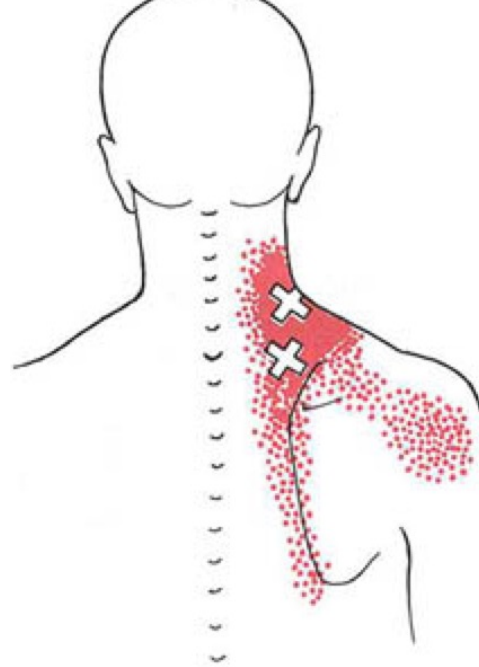
Nociception is extensive

Acute muscle strain is common

Risk factors for chronic pain in MFP are common

Myofascial pain is most common disorder causing chronic pain

Myofascial Pain Prevalence



General population

13% have shoulders MFP in general population (n=200)

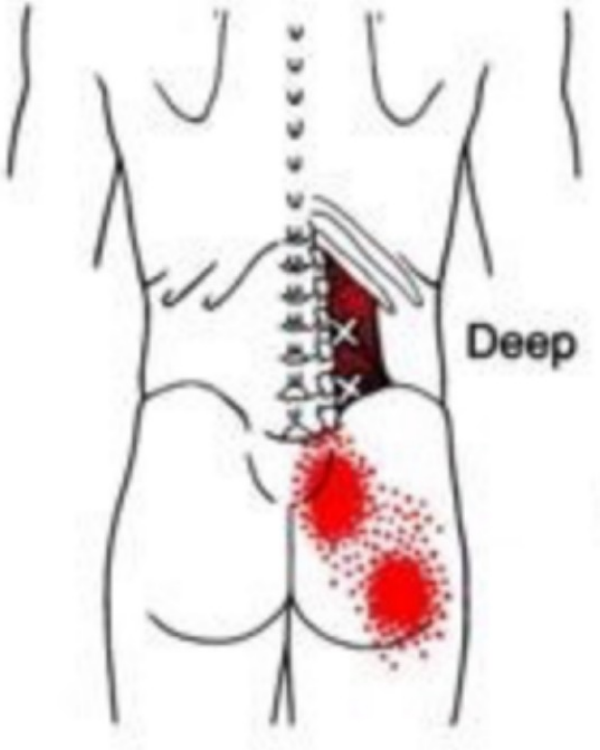
Sola et al AJ Phys Med Rehabil,1955

30% of all patients with pain in internal medicine practice(n=54) Skootsky et al. Western Journal of Medicine,1989

19% have masticatory MFP in young adult population (n=308)

Marklund et al. Acta Odontologica Scandinavica, 2008

Myofascial Pain Prevalence



Pain populations

85% of back pain patients in hospital pain clinic (n=283)

Rosomoff, Pain, 1989

55% of head and neck pain university pain clinic (n=296)

Fricton J, et al. Oral Surgery, Oral Medicine, Oral Pathology, 1985

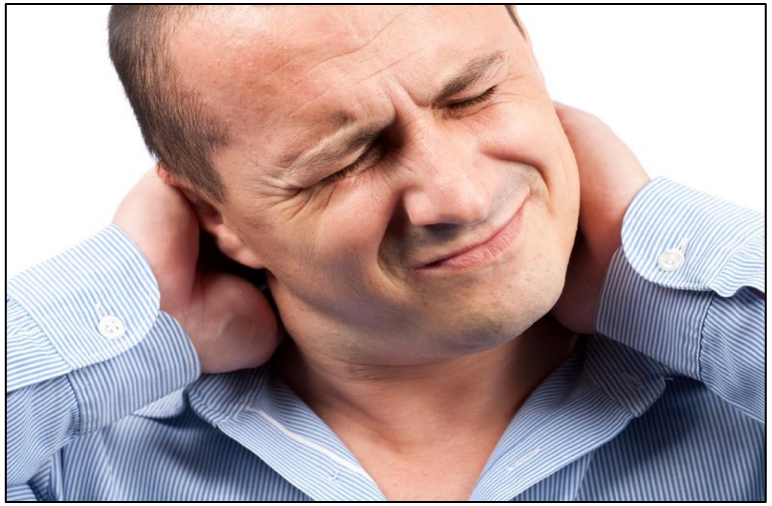
65% of patients in rehabilitation clinic (n=150)

Gerwin, PM & R Clinics of N.A, 2014

#1 reason people seek care

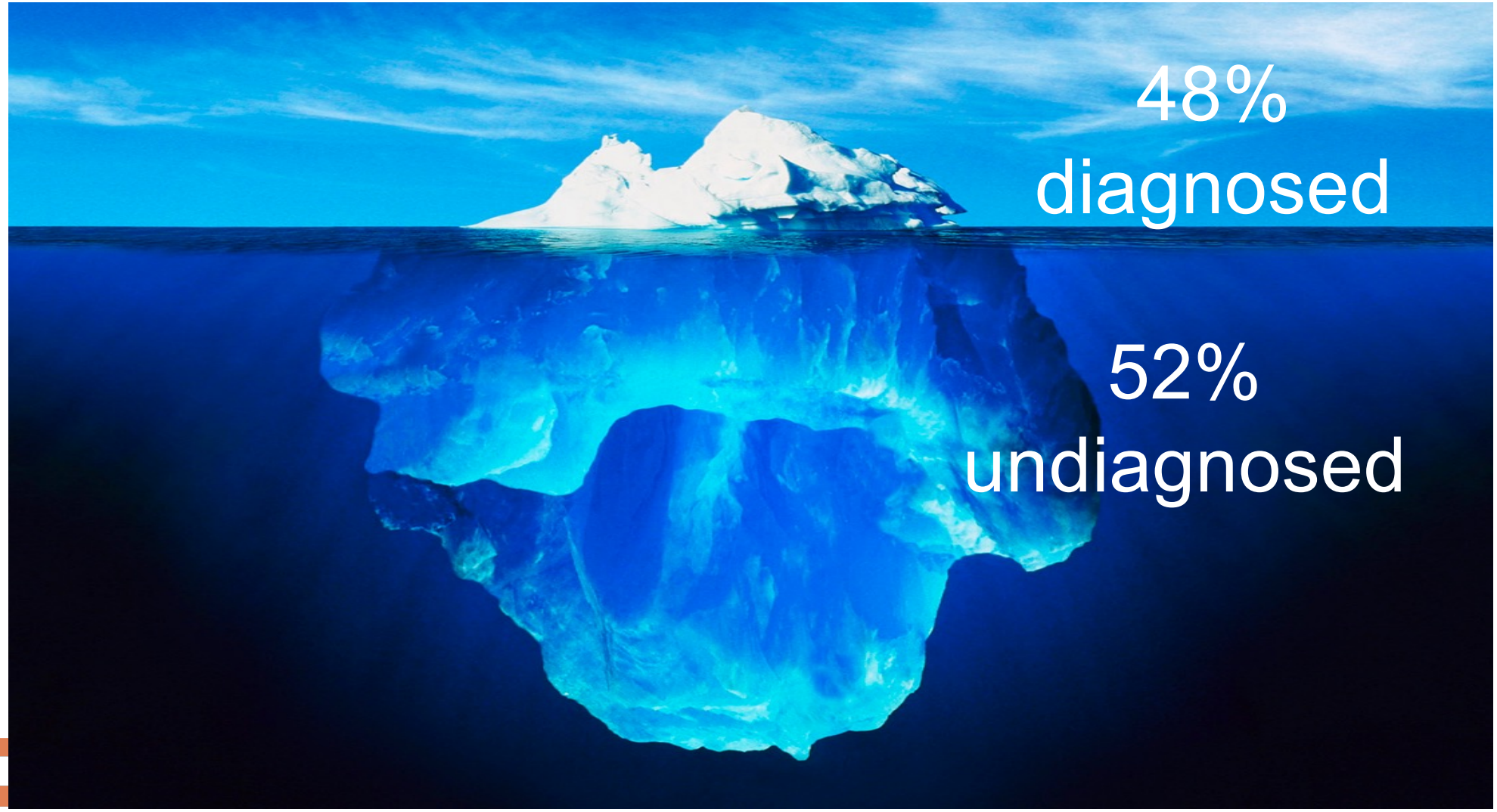
67%

of all visits

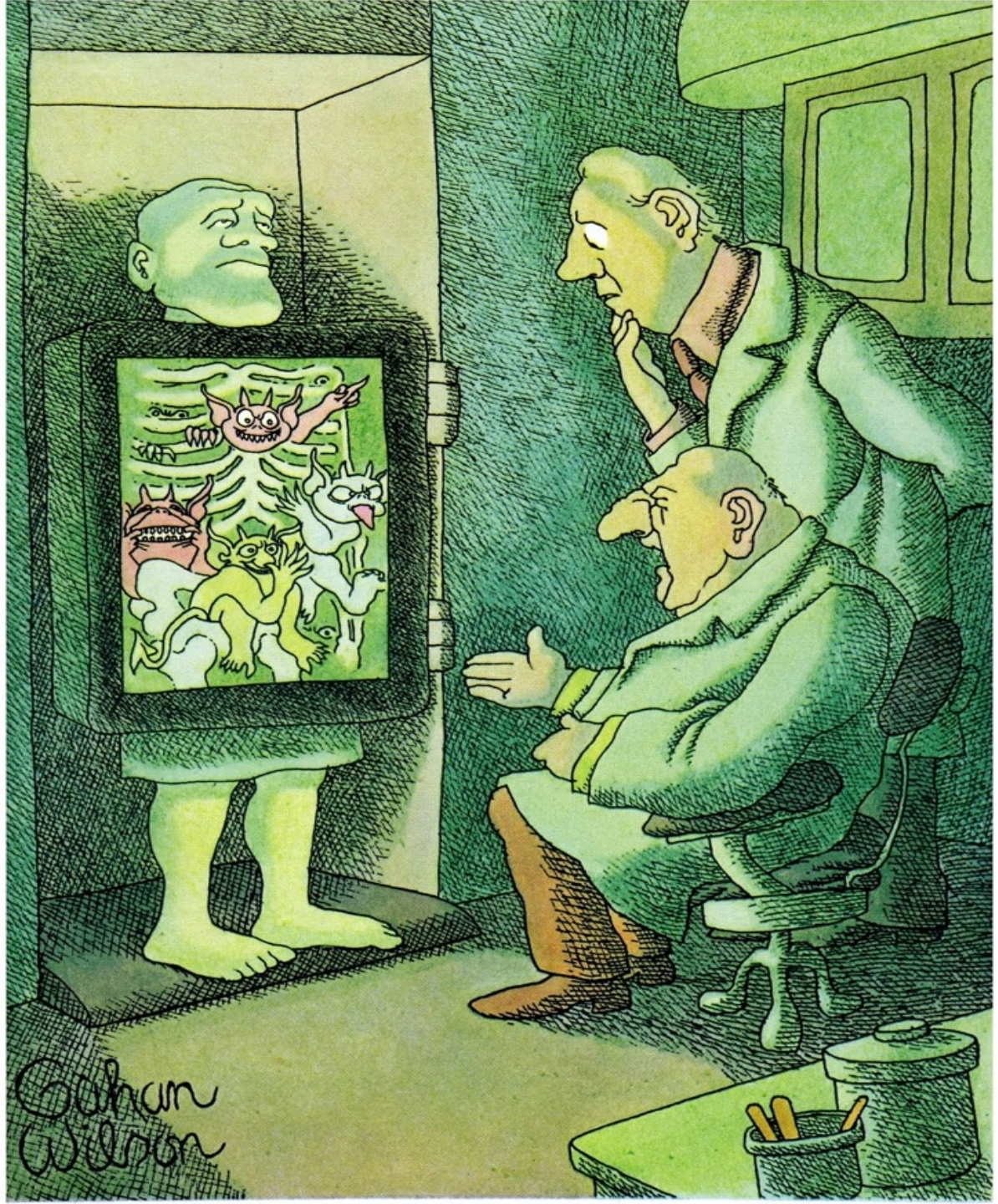


Mayo Clinic Proceedings, 2009

Yet, it is often overlooked…



Lipton RB et al. Headache. 2001.

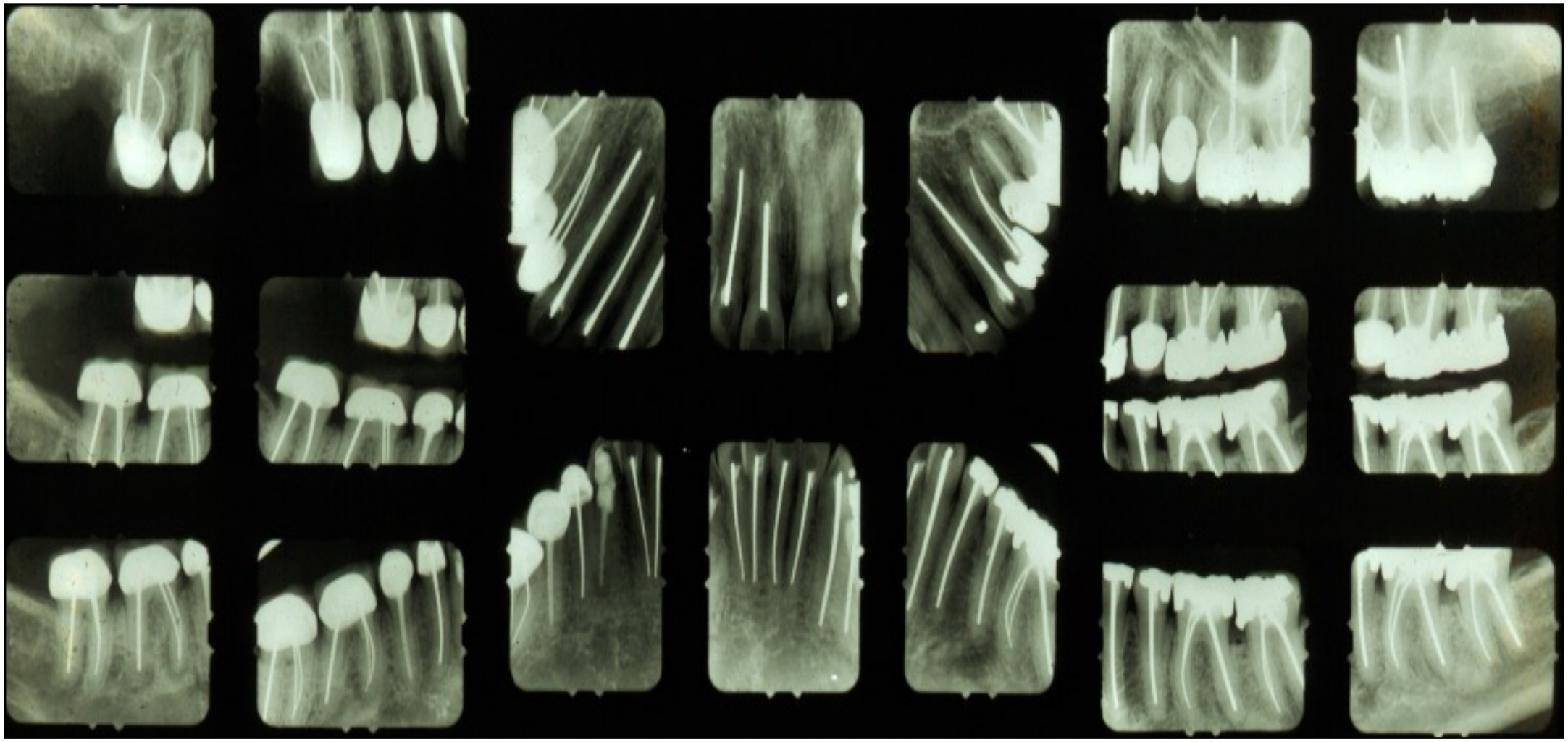


...Misdiagnosed

"It's as I suspected.
Mr. Harding, here, is
possessed by demons causing
the pain"

www.conversationswithcarolyn. blogspot.com/2013/08/the-fibromyalgia-letter.html

...over-treated



Fricton, J. Case of misdiagnosis and overtreatment of tooth pain from myofacial pain

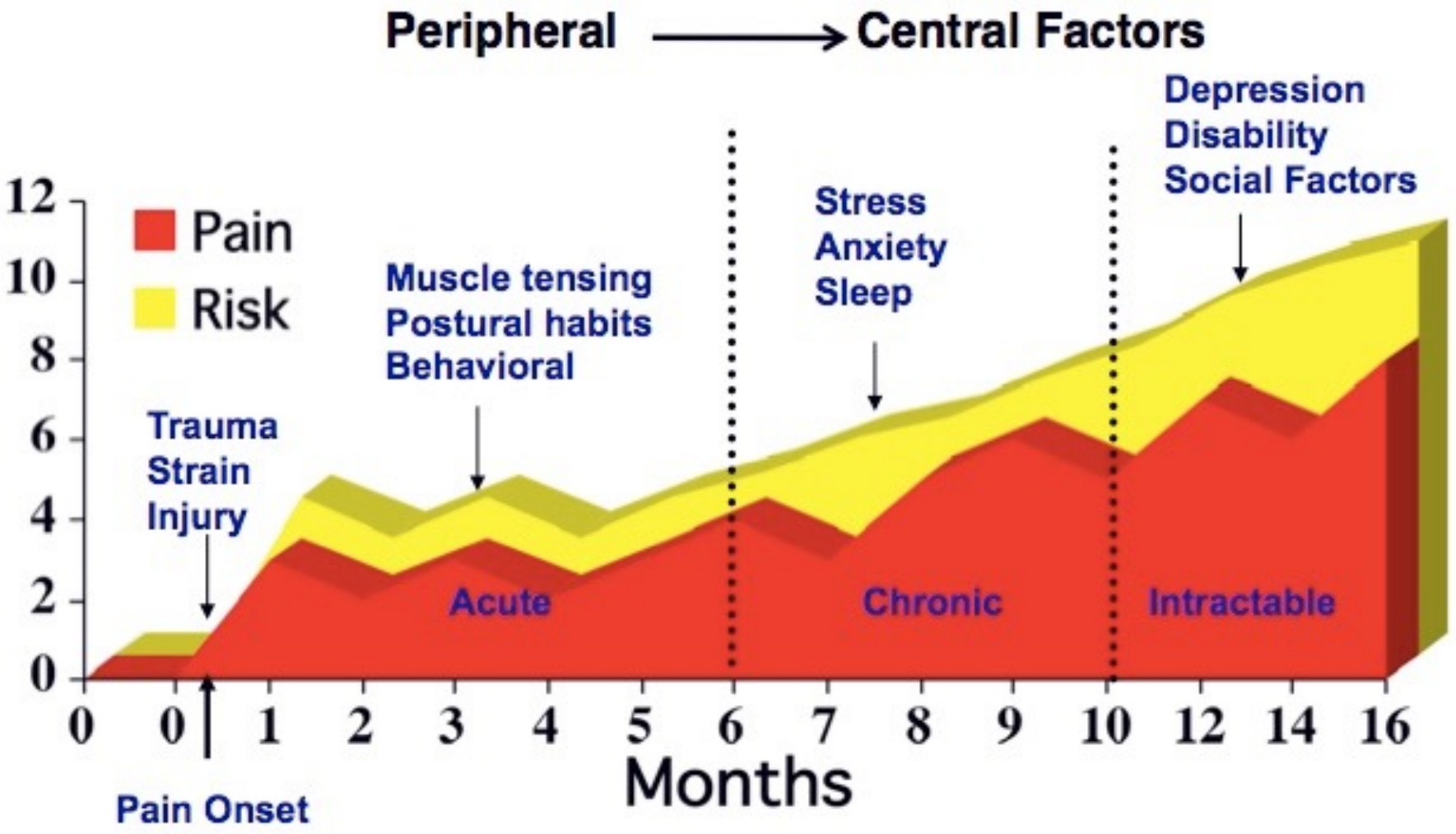
...and unsuccessfully treated

Longitudinal studies of chronic pain show that most people who have pain at 1 month...

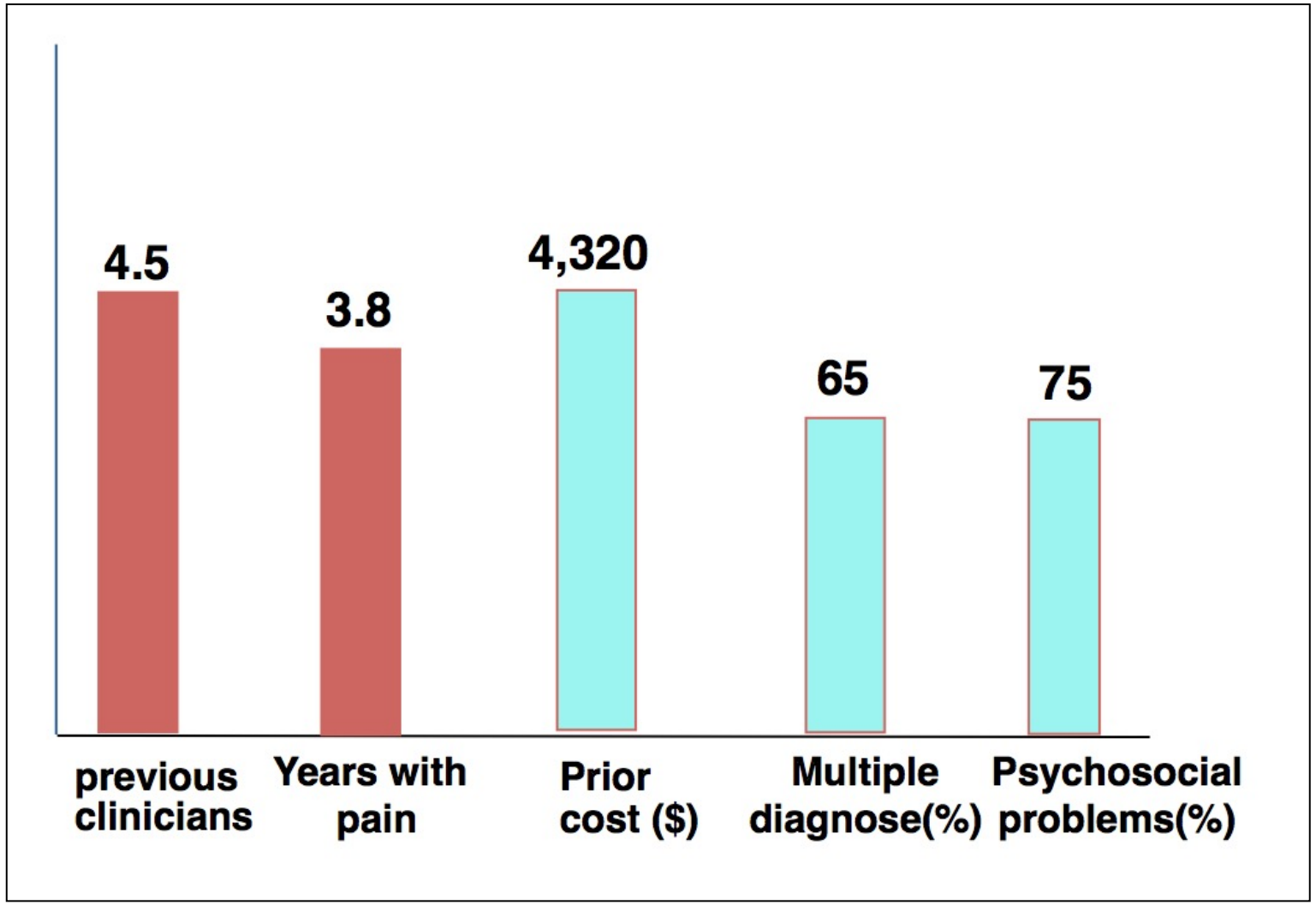
still have pain 5 years later despite treatments

-Hestbaek (2003), Deyo (2009). Aggarwal(2010). Scher (2003), Cote (2004)

Progression to chronic pain is common...



….with complex histories



*From Look et al, 2000 **Fricton, et al, 1995

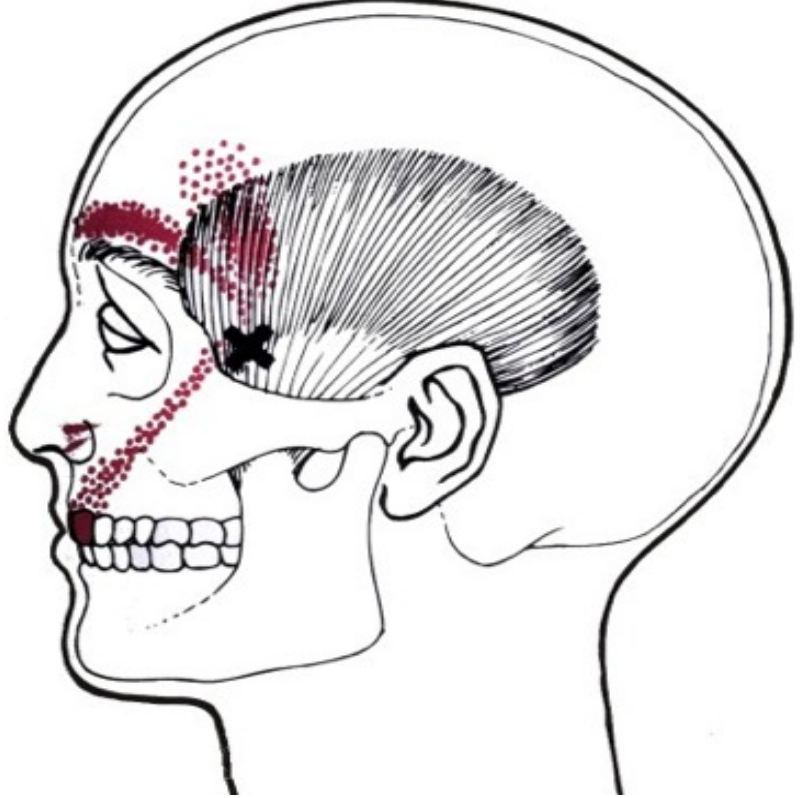
Myofascial p**ain** can be **simple**

Prevalence is high, yet MFP is

- Easy to identify
- Clear mechanisms
- Consistent changeable causes
- Treatments that work well short-term
- Training that is easy to implement and works long-term
- Transformative care is appreciated by patients

We all need to understand it

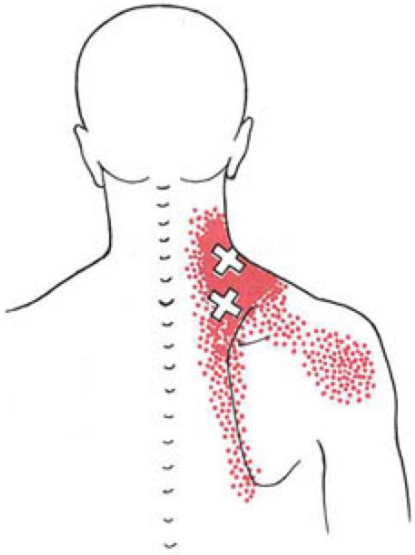
Myofascial Pain can occur in any skeletal muscle:



Regional pain due to localized tender nodule in a taut band of muscle, tendon, or fascia that when palpated reproduces pain in local and distant referral sites

-Travell and Simons

Myofascial Pain: Characteristics



- Trigger point: tender nodule in a taut band of skeletal muscle (active TP = spontaneous pain, latent TP= tender only)
- Referred pain: Regional and distant referred pain and tenderness
- Twitch response: twitch upon palpation in larger muscles (EMG documented)
- Motor dysfunction: weakness, limited ROM, pain in ROM
- Autonomic symptoms: referred pain, hyperemia, altered sensation, imbalance/dizzy, blurring vision, tinnitus, plugged ears

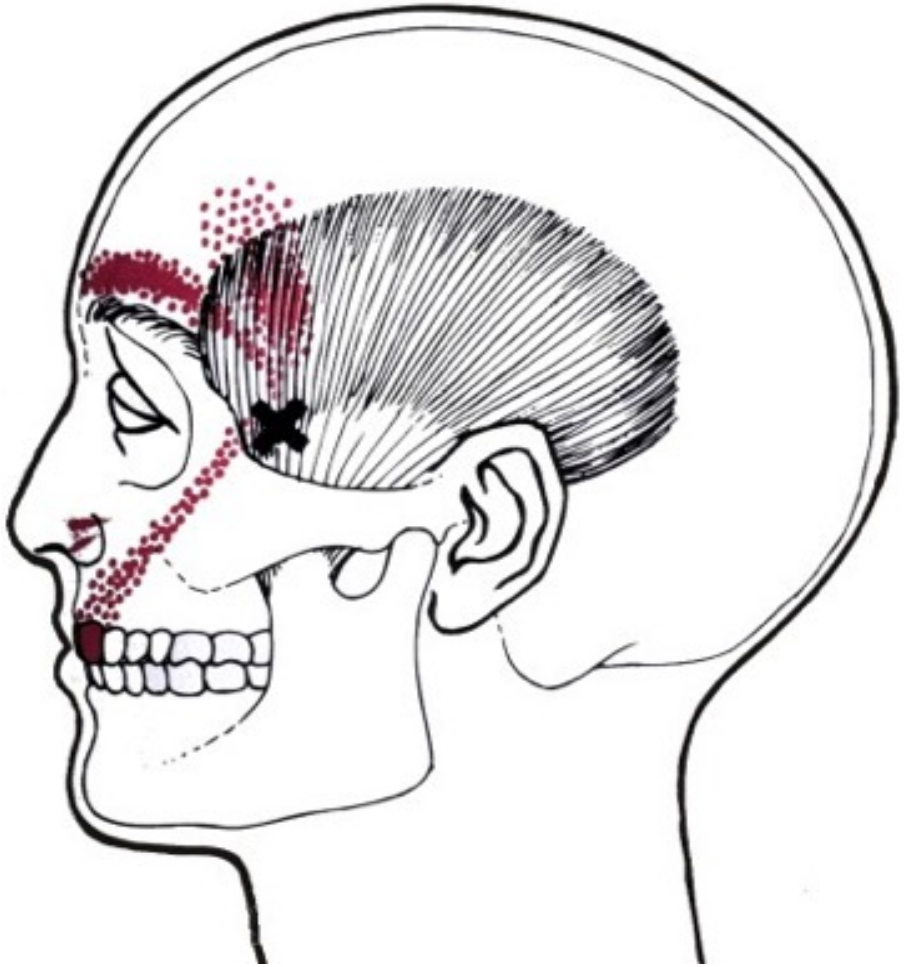
Travell and Simons

Myofascial Trigger Point Referral Patterns

Pain Source: Anterior Temporalis

Pain Site:
- Temple
- Frontal
- Retro-orbital
- Maxillary Anterior Teeth

Associated Sx: Dental hypersensitivity



⊗ = Trigger Point

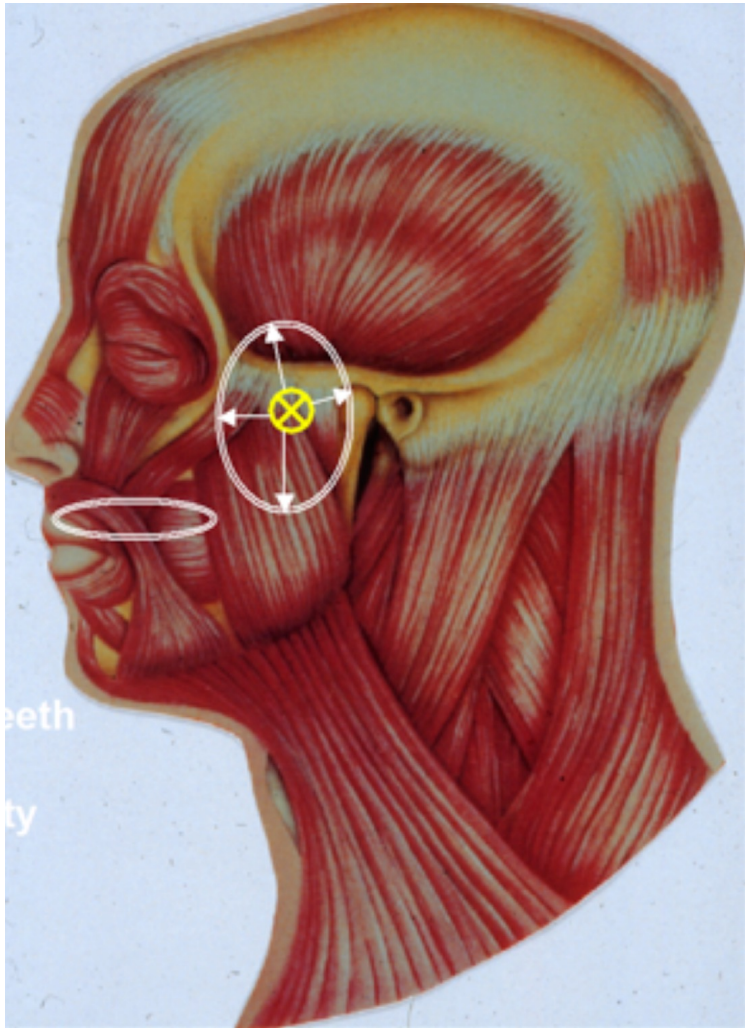
⬭ = Pain Referral Pattern

Myofascial Trigger Point Referral Patterns

Pain Source:Deep Masseter

Pain Site: **Pre-auricular**
Earache
Maxillary Posterior Teeth

Associated Sx: Dental hypersensitivity



⊗ = Trigger Point

⬭ = Pain Referral Pattern

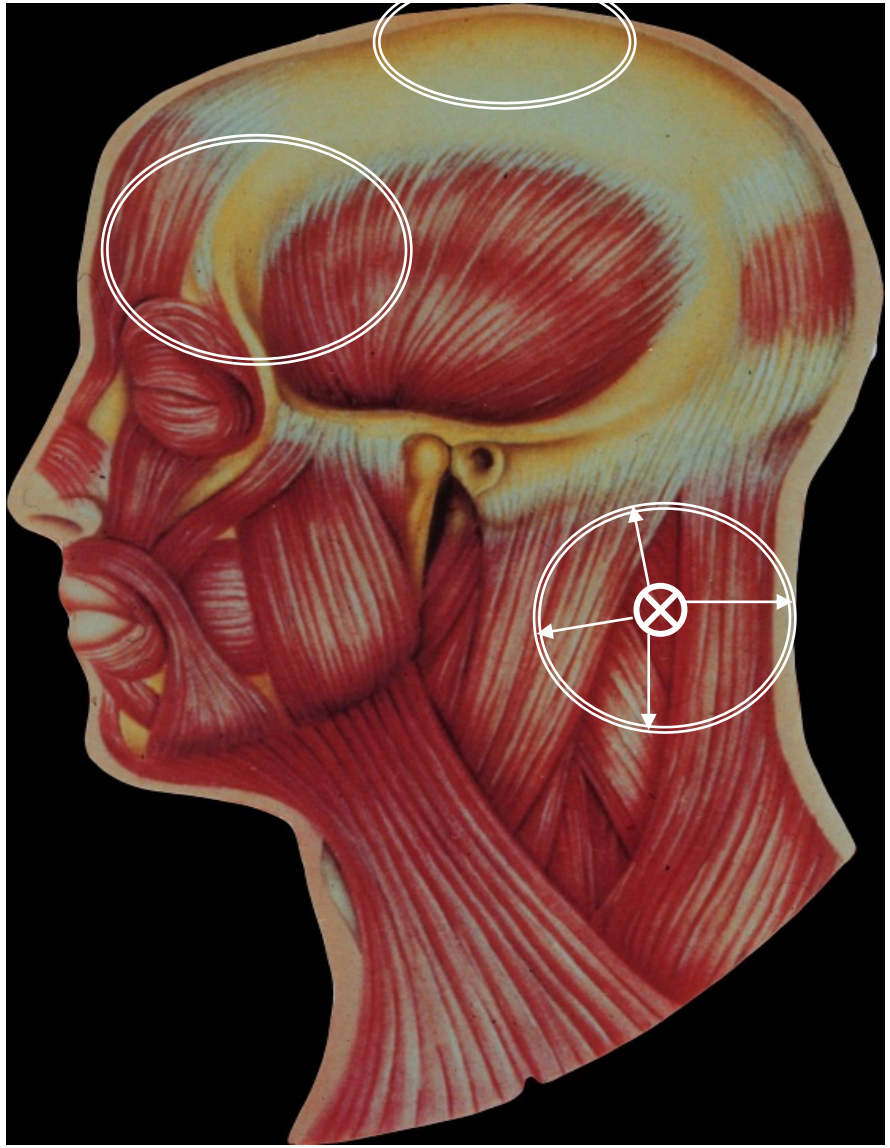
Travell and Simons, 1999
Fricton, J. Oral Surg.1987
Wright, E., JADA, 2000

Myofascial Trigger Point Referral Patterns

Pain Source: Splenius Capitis

Pain Site: Frontal
Occipital
Posterior Neck
Vertex

Associated Sx: Migraine

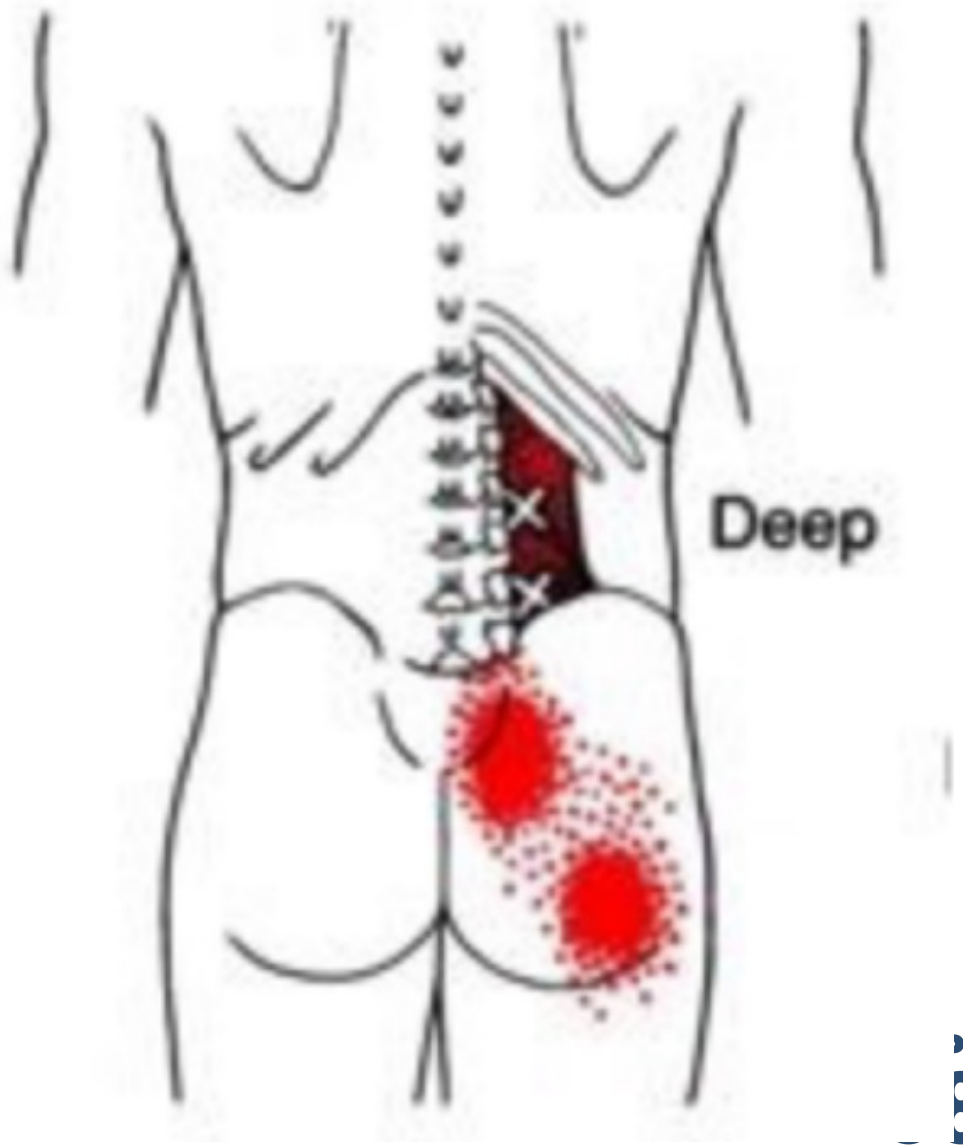


Fricton, J. Oral Surg.1987
Travell and Simons, 1999
Wright, E., JADA, 2000

Myofascial Trigger Point Referral Patterns

Pain Source: Quadratus Lumborum
Pain Site: Hip
Back

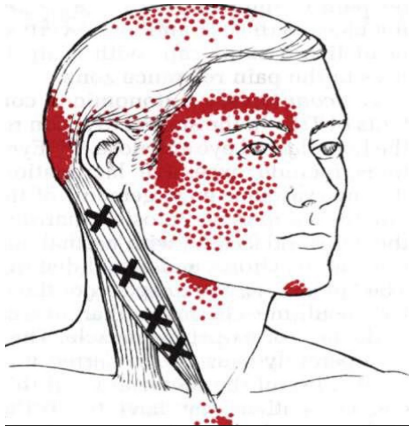
Associated Sx:



Fricton, J. Oral Surg.1987
Travell and Simons, 1999
Wright, E., JADA, 2000

Classification of Muscle Pain Disorders

Myofascial Pain

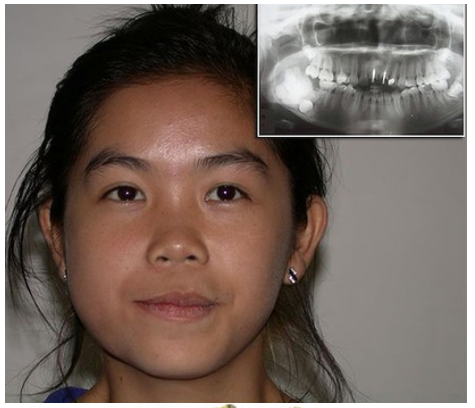


Myositis

Myospasm

Contracture

Neoplasia



Fibromyalgia

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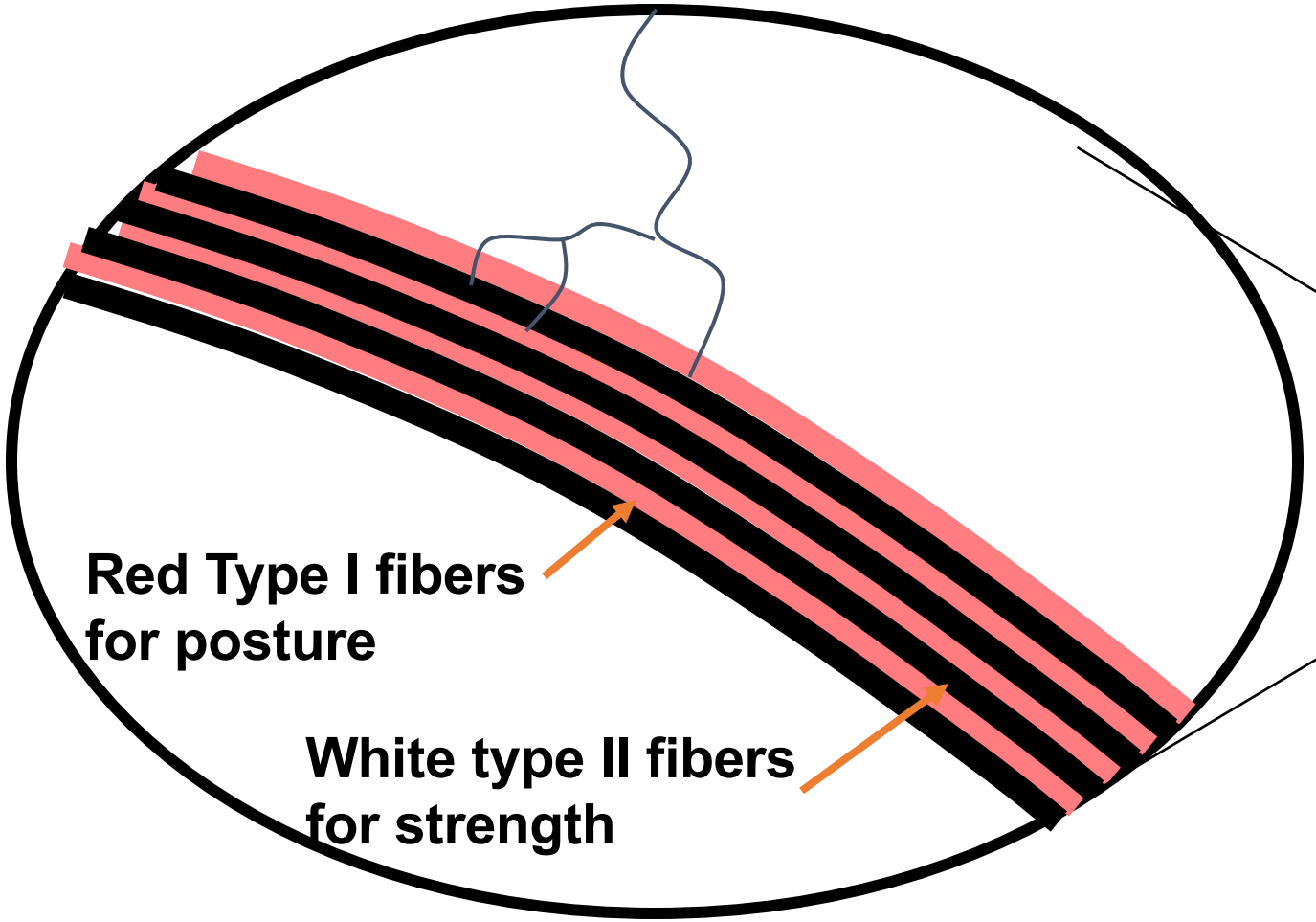
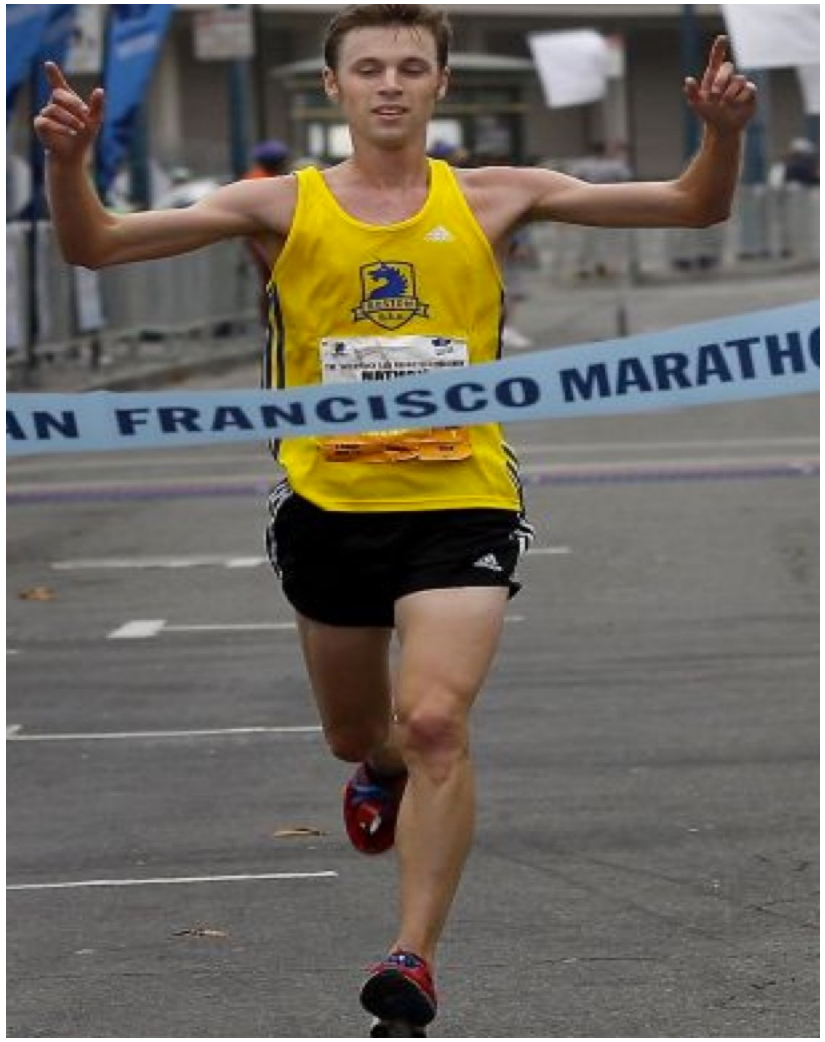
Mechanism of Myofascial Pain
First, understand the muscles



Type I and II fiber types are distributed throughout all skeletal muscles

Muscle Fiber Type I (red, slow)

- Postural muscle tone
- High endurance
- Slow twitch (red)
- High oxidative phosphorylation with high O2, ATP production, mitochondria, and increased vascularity
- Marathon runner



Muscle Fiber Type II (white, fast)

- Large forces over brief period
- Low endurance
- Fast twitch (white)
- Anaerobic glycolysis with low O2, low mitochondria, high lactic acid
- Sprinter

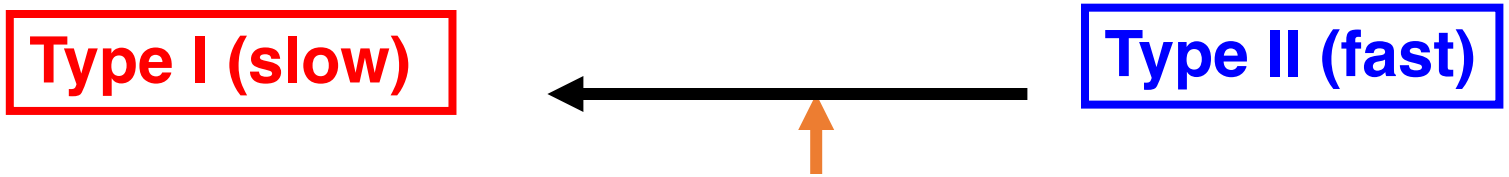
Muscle fibers are like chameleons

Increased demand from high forces
for short periods

Type I (slow) ⇄ **Type II (fast)**

Increased demand from postural strain
for longer periods

With repetitive strain, muscle fibers of type I compensates but often loses resulting in pain

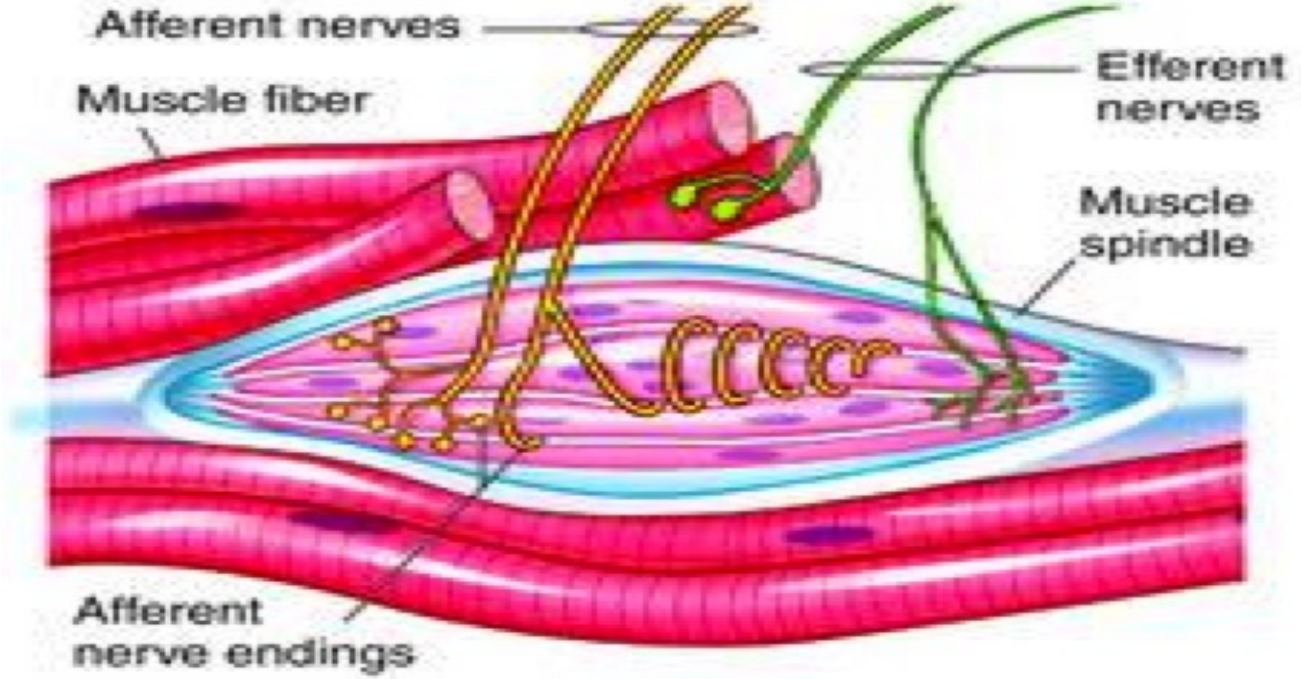


Increased conversion due to repetitive postural strain

- Abnormal Metabolic Activity in Type I Fibers
- Low Oxygen and ATP (fuel depleted)
- Increased and ragged Type I Posture Fibers
- Decreased Type II strength fibers with atrophy
- Abnormal mitochondrial changes on EM on Type I

-Larsson, et al, 1988, Bengsston, et al, 1986, Dennett, Fry, 1988

Muscle Pain: The Nociceptors



Type III

Increase in Resting Activity

↓

Spontaneous Continous Pain

Type IV

High Threshold Mechanoreceptors

↓

Sensitization and increased Tenderness

Mense, 1990

Mechanisms of Myofascial Pain

Sensitization: Increased synaptic efficiency due to repeated firing of synapse at the peripheral and central nervous system level

Hyperexcitability: An enhanced pain report from natural stimuli

Primary hyperalgesia: Decreased threshold for pain in an injured tissue

Secondary hyperalgesia: Decreased threshold for pain in the surrounding tissues.

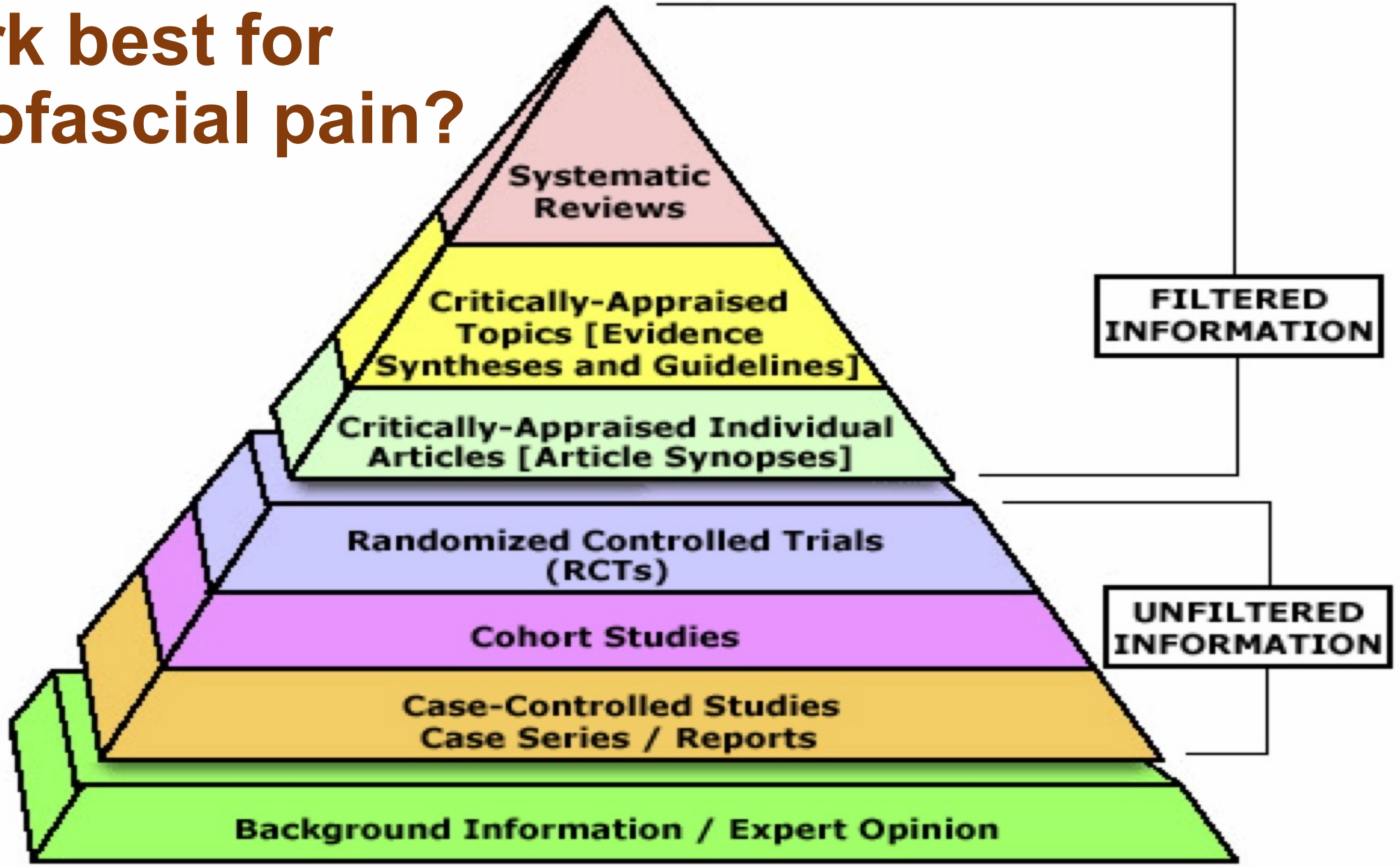
Peripheral Sensitization

- Hypersensitivity of nociceptive primary afferent neurons (pain nerves) in the tissues
- Mediators include bradykinin, prostaglandins, neuropeptides, and cytokines
- Upregulated (promoted) during inflammation, injury, and repetitive strain

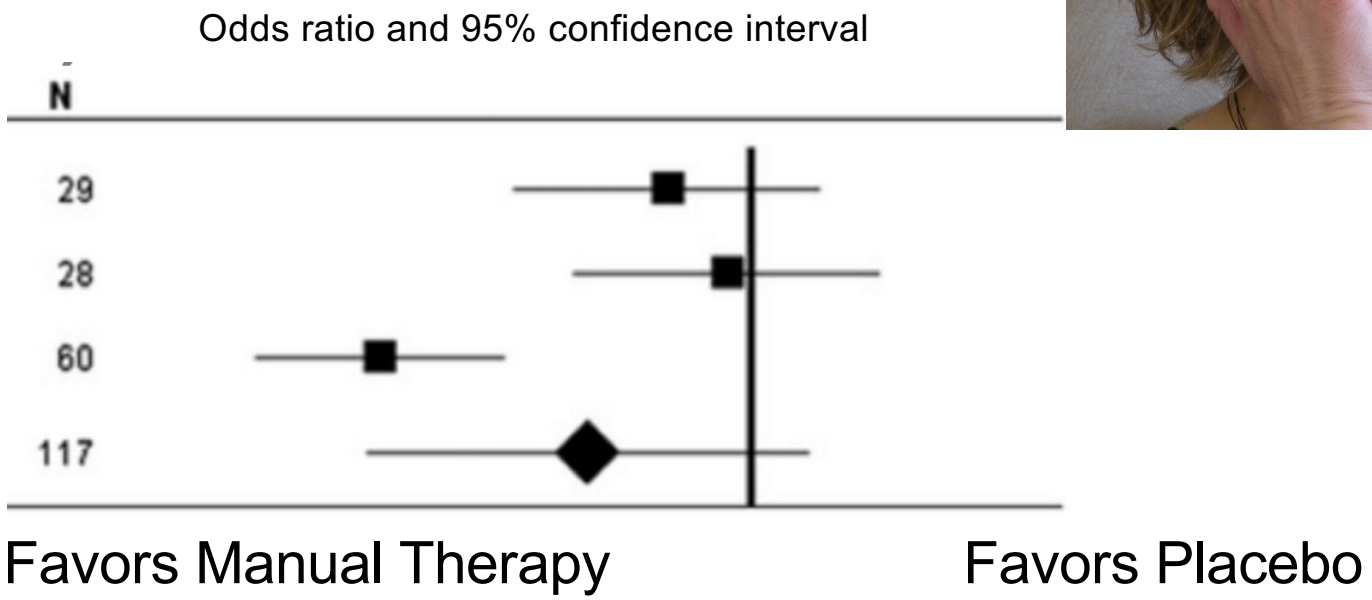
Central Sensitization

- Hypersensitivity of nociceptive neurons in the central nervous system (spinal cord and brain)
- Mediated by glutamate through N-methyl-d-aspartate (NMDA), substance P and calcitonin gene-related peptide (CGRP)
- Upregulated (promoted) during sustained threat to body

What treatments work best for myofascial pain?



Treatment:
Manual myotherapy (trigger point massage) vs placebo: Forest plot (RCTs with n=117)

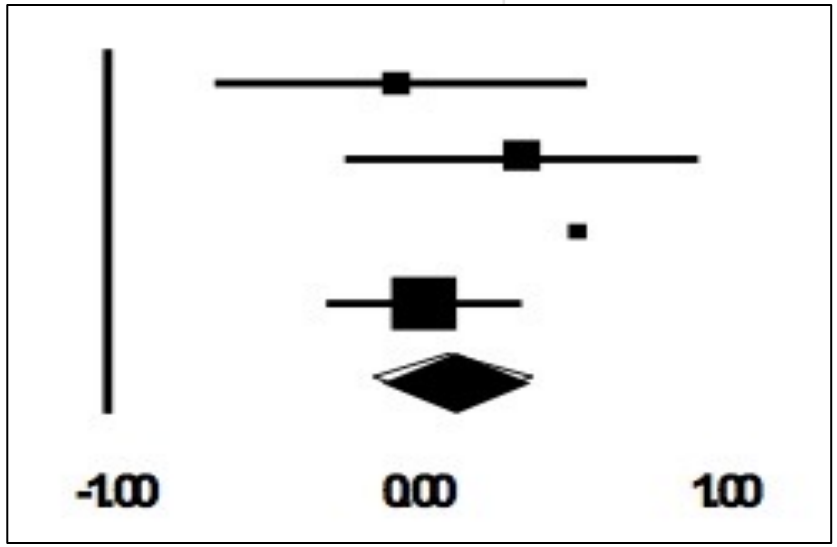


Conclusion: Overall trend toward showing favorable effects of the manual compared to placebo (P=0.03)

Treatment:
Dry needling/ acupuncture vs placebo: Forest plot (n=371)

Odds ratio and 95% confidence interval

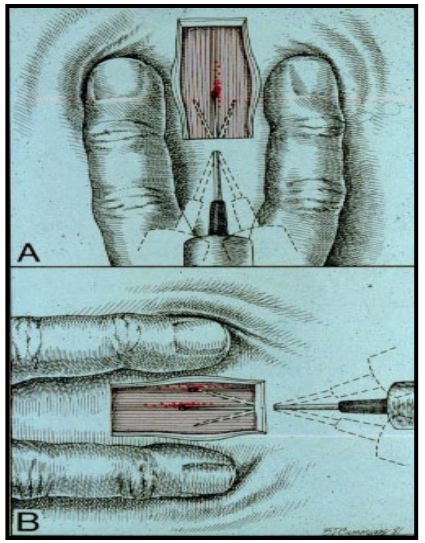
Karst et al. 2000
White et al. 2000
Goddard et al. 2002
Melchart et al. 2005



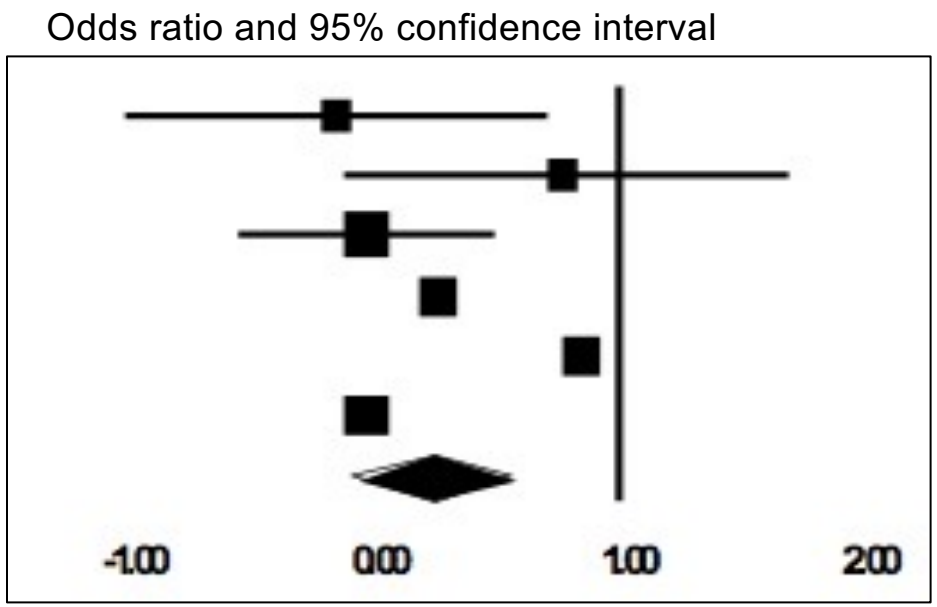
Favors Placebo Favors Acupuncture

Conclusion: Slight overall trend toward showing favorable effects of the acupuncture compared to placebo (P=0.03)

Treatment:
Trigger point injection vs placebo:
Forest plot (n=484)



Rollnik et al. 2000
Nixdorf et al. 2002
Schmitt et al. 2001
Padberg et al. 2004
Kokoska et al. 2004
Ferrante et al 2005



Conclusion: Slight overall trend toward showing favorable effects of Injections compared to placebo ($P<0.001$)

Pain Treatment: Failed treatment leads to chronic pain and addiction

- Over half of individuals with pain conditions at 1 month still have pain 5 years later
- Many of these patients continue to seek care for their pain years after onset
- Failed treatment, delayed recovery, chronic pain, and addiction is often due to patient-centered physical, behavioral, and psychosocial risk factors not addressed in usual care

Hestbaek et al *Eur Spine J* 2003, Deyo, et al *JABFM,* 2009, McGreevy et al *Eur J Pain* 2011, Aggarwal et al *Pain.* 2010; Scher e tal Pain 2003; Cote et al *Pain.*2004

2011 Academy of Medicine Report on Relieving Pain

Health professionals' primary role for chronic pain should be guiding, coaching, and assisting patients with day-to-day self-care.

- ✓ Better long-term outcomes
- ✓ Higher patient satisfaction
- ✓ Reduced cost of care

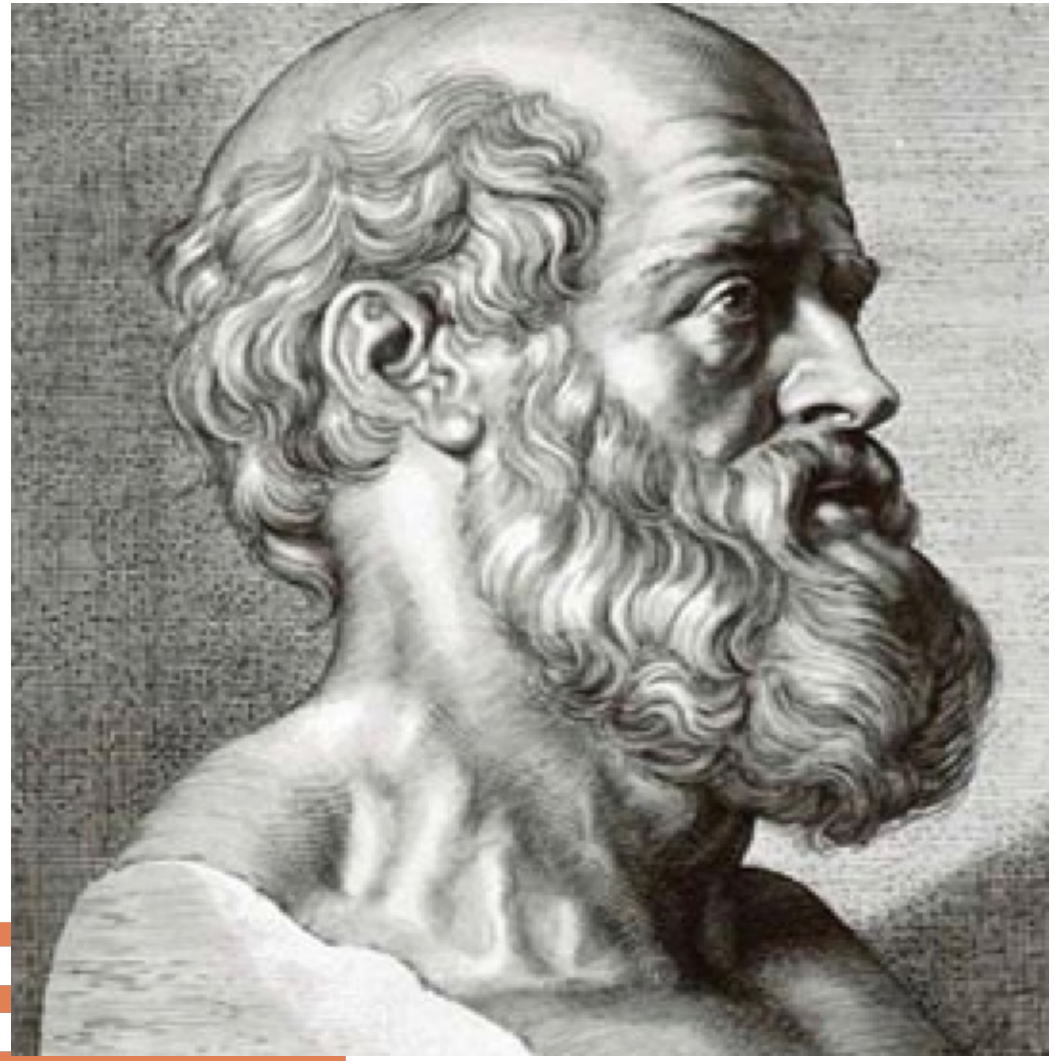
Institute of Medicine. *Relieving Pain in America: A Blueprint for Transforming Prevention, Care, Education, and Research.* Washington DC: National Academies

Unfortunately, self-care training is usually neglected in routine care due to...

- ✓ Not part of biomedical model
- ✓ No time to “train” patients
- ✓ No reimbursement
- ✓ No tools for health professionals to use
- ✓ Time is spent on tedious electronic health record charting

Battersby M et al. The Joint Commission Journal on Quality and Patient Safety. 2010

Consider ancient wisdom…



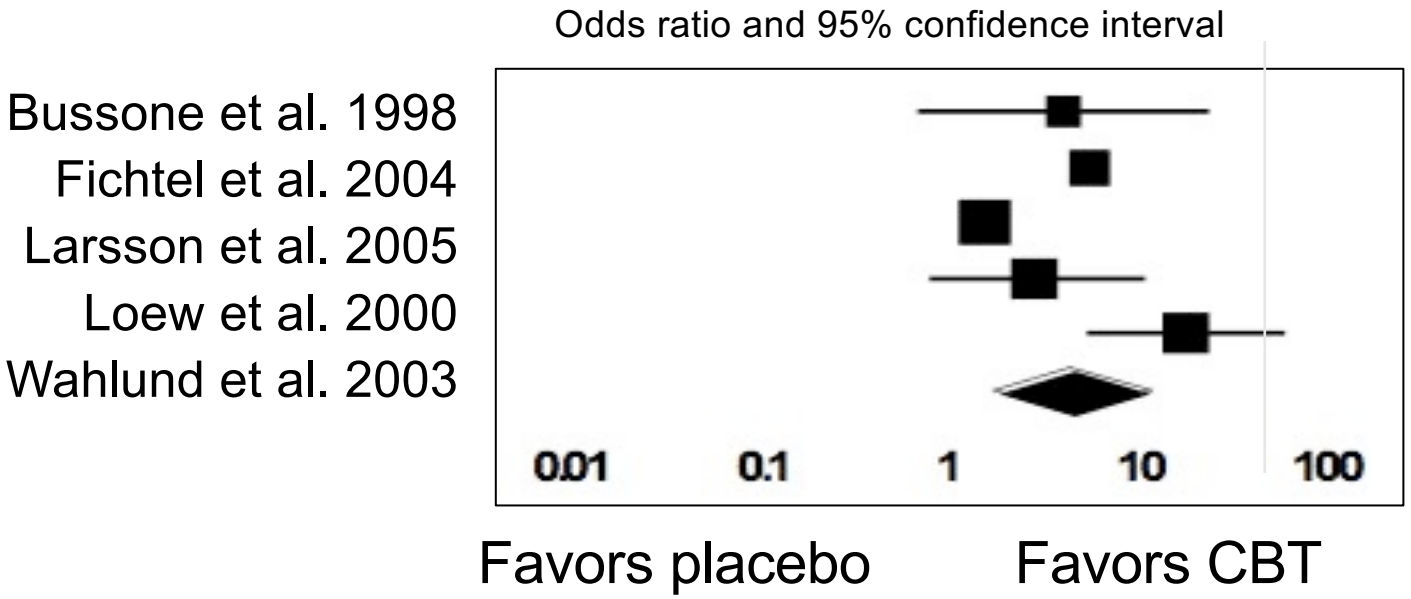
"It is more important to know what kind of person has a disease than to know what kind of disease a person has."

-Hippocrates
(384 BC to 322 BC)

Transformative Care

- **Treatment** with medications, therapy, injections, etc
- **Training** patients in self-care to reduce risk factors with protective healthy actions
- **Telehealth Coaching** to support patients in achieving goals with self-care
- **Technology** with Patient-Engagement Platform (PEP) includes risk assessment, risk reduction training, health coaching platform, progress assessment, resources, scheduling, and more

Training:
Cognitive-Behavioral Therapy vs placebo Forest Plot (n=633)

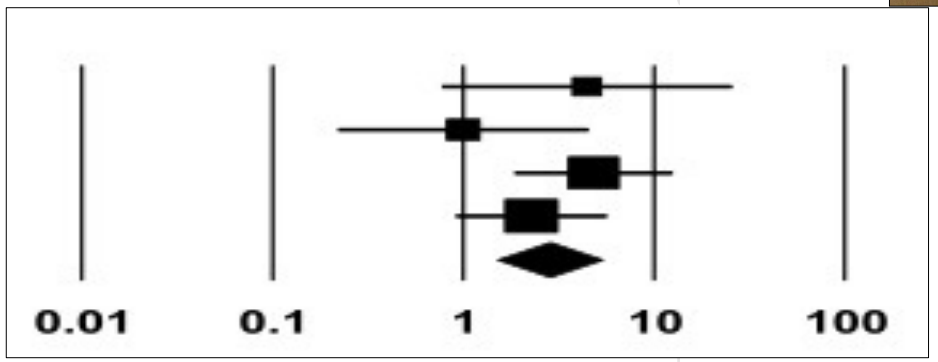


Cognitive-behavioral treatments are better than placebo includes oral habit instruction, relaxation, or biofeedback for TMD/MFP patients with day or night oral habits, anxiety, stress, or feeling tension

Training:
Exercise vs placebo:
Forest plot (n=150)

Odds ratio at 95% confidence interval

Burgess et al. 1988
Dall'Arancio et al. 1993
Wright et al. 2004
Torelli et al. 2000



Favors placebo Favors exercise

Conclusion: Stretching exercise shows greater improvement than placebo in treating MFP pain.

Fricton, J, et al Current Pain & Headache Reports 13(6):413-419, 2009.

Understanding and Managing the whole person means…

Reduce Risk Factors (causes)

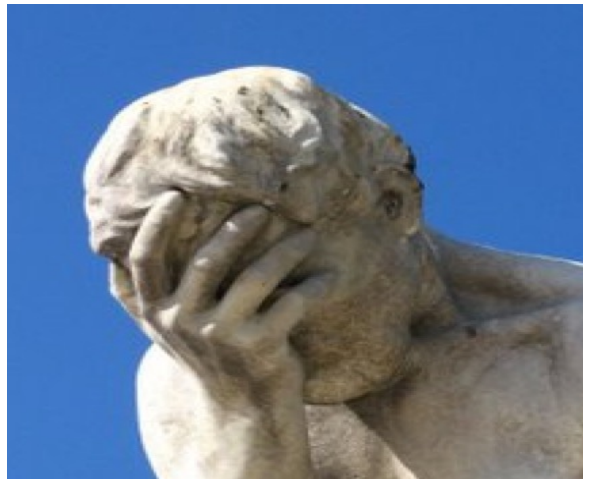
Characteristic, condition, or behavior, such as poor sleep, diet, stress, repeated strain, that increases the possibility of illness, injury, pain (sensitization) BY…

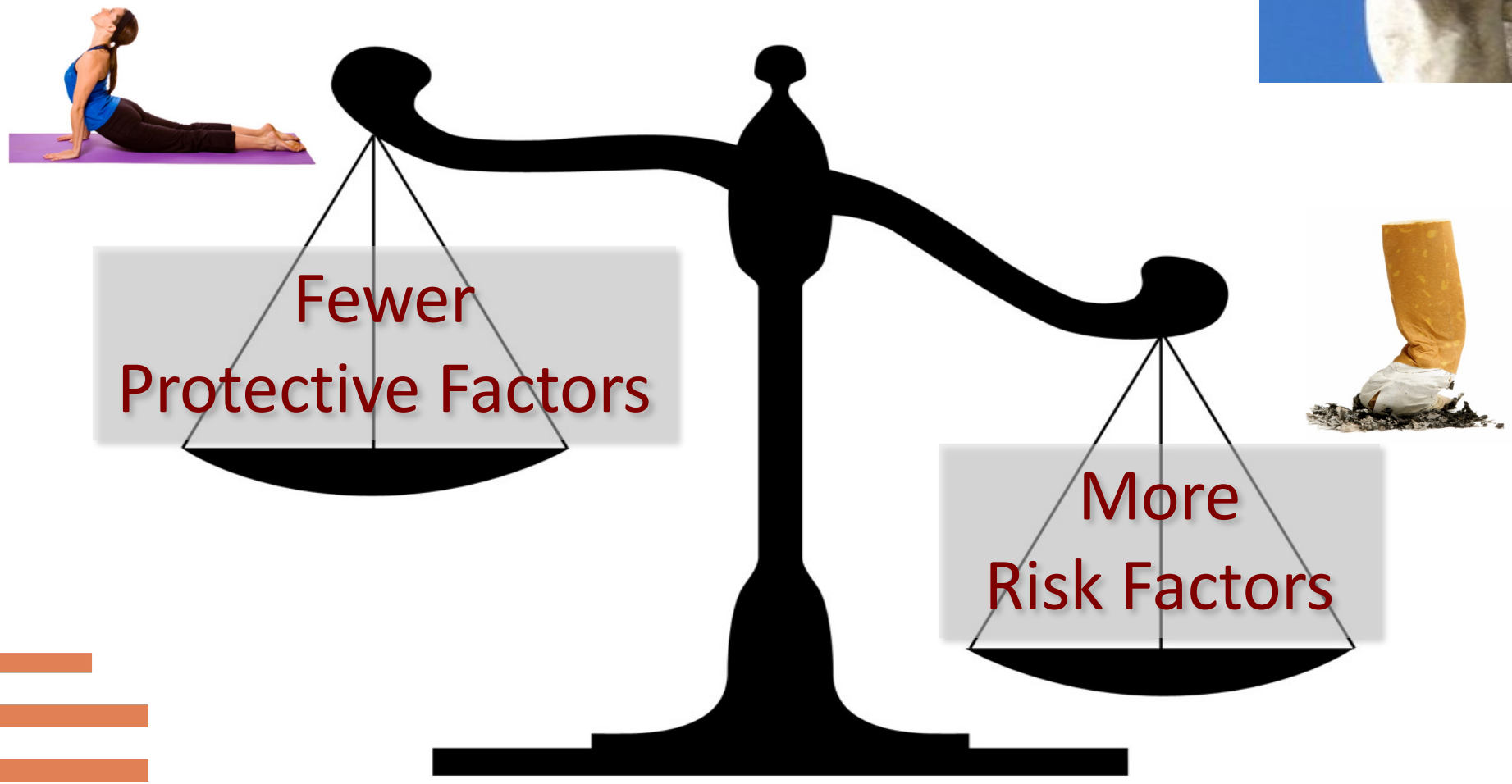
Implement Protective Actions

Characteristic, condition, or behavior, such as restful sleep, exercise or healthy diet that prevents or reduces vulnerability to developing an illness and pain.

Risk Principle = Delayed Healing

More Pain





Protective Principle = Normal Healing

No Pain

Fewer
Risk Factors

More
Protective Factors

Risk and protective factors affect pain in all realms of our lives

Peripheral Sensitization Risk

Body (trauma, strain, posture, co-morbid)

Lifestyle (Diet, sleep, pacing, chemical use)

Environment (safety, pollution, weather)

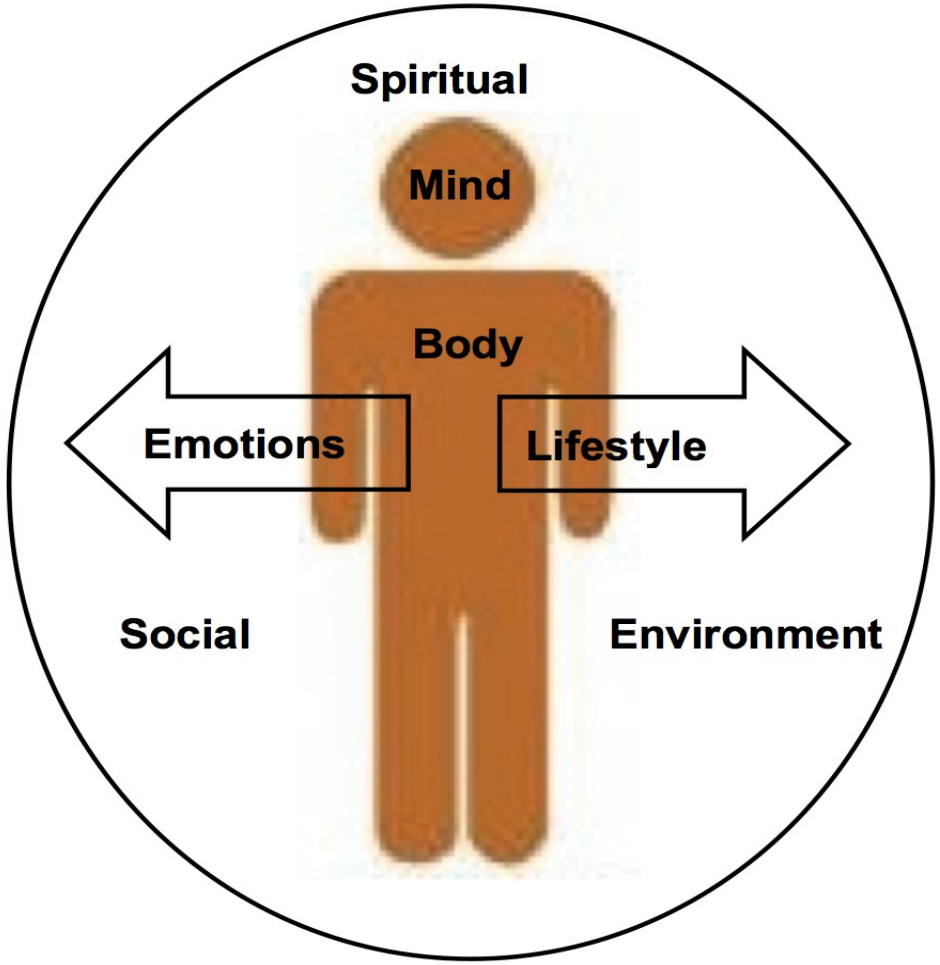
Central Sensitization Risk

Emotions (anxiety, depression, anger, fear)

Society (conflict, abuse, secondary gain)

Spirit (burn-out, feeling lost, stress, loss of hope)

Mind (confusion, expectations, negative thoughts



Understand the Pain Cycle

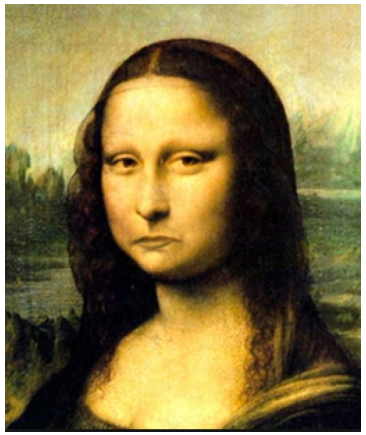
Patient Centered Care

Diagnoses e.g.
Myofascial pain
Arthralgia/ Arthritis
Migraine/ fibromyalgia

Symptoms e.g.
Neck shoulder pain
Back hip pain
Jaw Pain Headaches

Stressor e.g.
Emotions/ Thoughts
Work/ home
Lifestyle Sleep/Diet

Injury or Strain e.g.
Trauma event
Repeated strain
Postural tension



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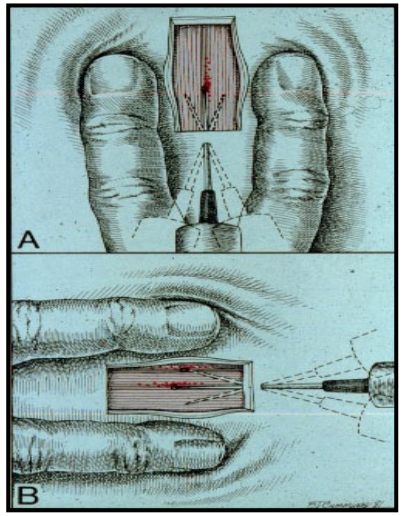
Predictable evidence-based Transformative care for Myofascial Pain

Treat the condition:

- Desensitize/ heal muscle with counter-stimulation
- Restore range of motion with physical therapy treatments

Train the patient:

- To reverse the pain cycle
- With exercises to improve range of motion, strength, and function of muscle
- To reduce risk factors that strain muscles
- To strengthen protective actions to heal muscles



Transformative Treatment Plans

Patient Centered Care

Testing
Risk Assessments
Imaging
Other

Training on causes
Telehealth Coaching
Micro-lessons in PACT
HABITS, PAUSES, CALM

Treatment of Condition
Meds
Physical Therapy
Injections

Healing & Relief
Improve pain
Normal function
Less treatment

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PACT

Personalized Activated Care & Training

Personalized Activated Care & Training (PACT) Pain Management Program

PACT allows Transformative Care to be easily implemented in routine care with any patient and extend the care into the patient's daily life.

www.pactforpain.com

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Evidence-based Research & Development

PACT
Personalized Activated Care & Training

Pre-development Research
(Risk and Protective factors) (NIH funded)

Completed

Conceptual evaluation in Coursera MOOC
(U of Mn funded) (n=55,000)
https://www.coursera.org/learn/chronic-pain

Completed

Randomized Clinical Trial with
PACT Version 1.0 (HPI & NIH funded) (n=80)

Completed

Clinic Pragmatic Trial
PACT Version 2.0 (n=500)

Completed

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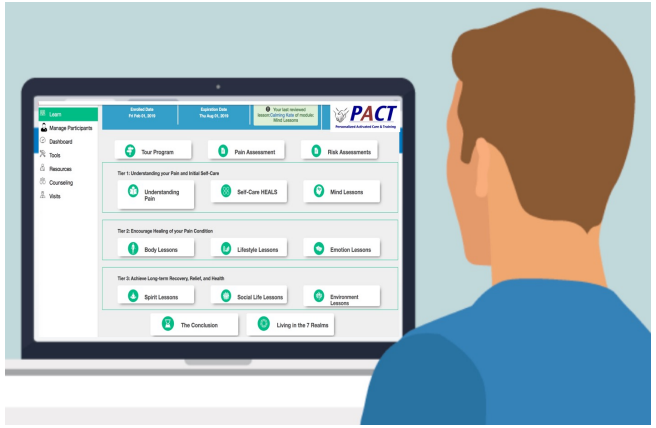
PACT is like an EMR, only for patients

Electronic Medical Record (EMR)

- ✓ For health professionals
- ✓ Medical information, Imaging, Lab
- ✓ Secure communication, Rxs
- ✓ Billing and Appointments
- ✓ Costs a % of revenue

Patient Engagement Platform (PEP)

- ✓ For patients
- ✓ Telehealth Coaching
- ✓ Risk Assessments with Personalized CBT Lessons
- ✓ Resources, Reminders, Dashboard
- ✓ Billing, documentation, scheduling, reminders
- ✓ Generates net reimbursement per patient



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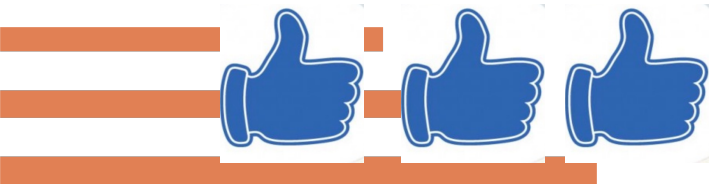
Tele-Health Coaching

- ✓ Extends care into patient's daily life
- ✓ Tele-health visits to support patients (30-45 min)
- ✓ Review Pain and Risk Assessment
- ✓ Help patient set and achieve goals
- ✓ Implement action plans
- ✓ Encourage adherence and overcome barriers
- ✓ Improve success and outcomes
- ✓ Identify red flags and facilitate referrals, if needed

PACT
Personalized Activated Care & Training



= excellent RCT outcomes for health coaching

IMS

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Preventing Chronic Pain

Patient Centered Care

Chronic Pain. It's Real.
It's Preventable. Learn how.

www.myopain.org

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"Divine is the task to relieve pain." -Hippocrates

Questions?