



New Horizons in Brain-First Pain Care

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Colorado Pain Society
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University of Colorado
Anschutz Medical Campus

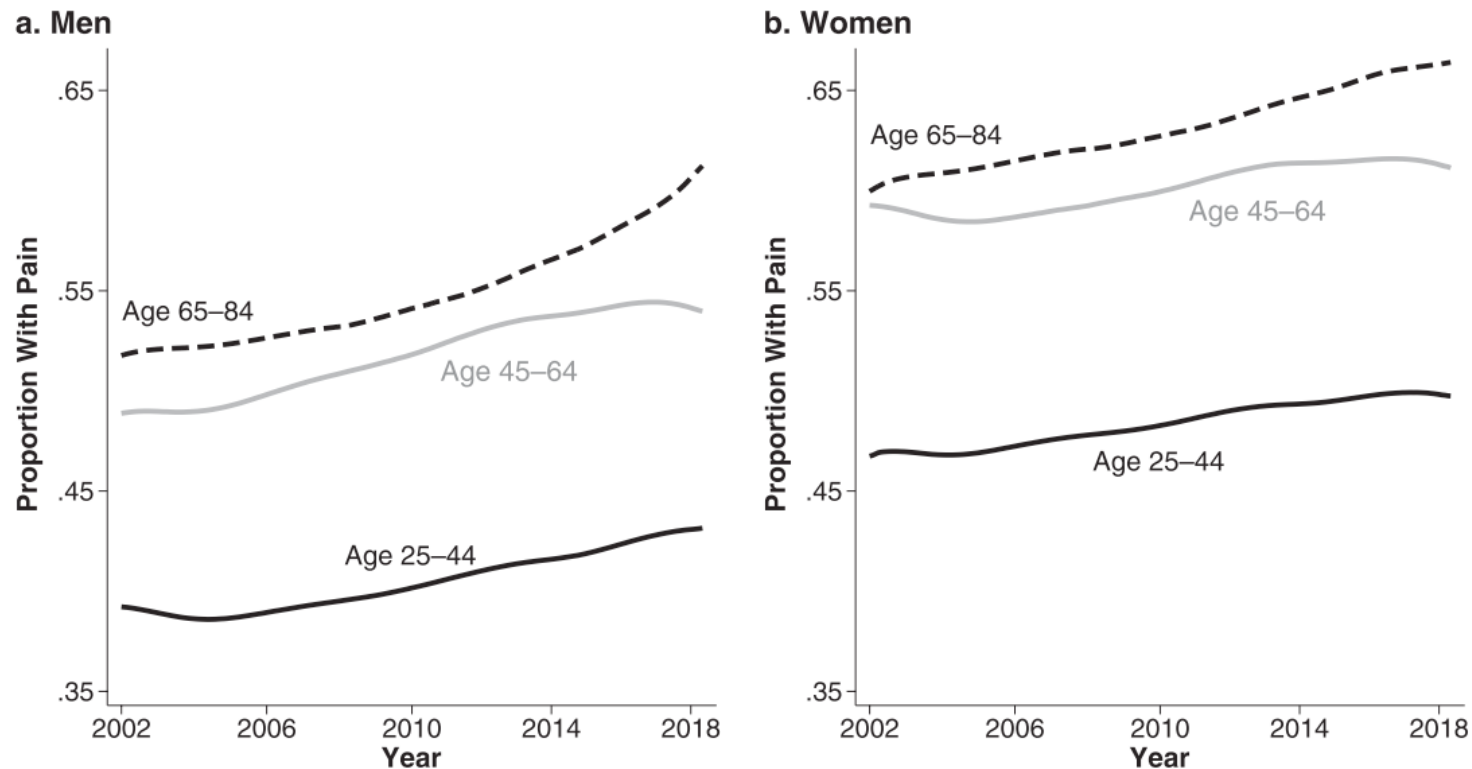
Conflicts of interest

- Consultant with
 - Lin Health, Inc
 - Mental Health Partners of Boulder County
 - Pain Reprocessing Therapy Center

Chronic Pain: State of Affairs

Huge expenditures: **\$560 - \$635B annually**

Rising prevalence:



Murray et al., JAMA, 2013; Reid et al., JAMA Int Med, 2016; IOM 2011; Grol-Prokopczyk, 2017, 2021; Roy et al 2021

Chronic Pain: State of Affairs

Huge expenditures: \$560 - \$635B annually

Rising prevalence:

a. Men

b. Women

“I’ve tried everything”

“My pain started at age 12... now I am 60”

“I’ve seen 95 different doctors”

“They think I’m making it up”

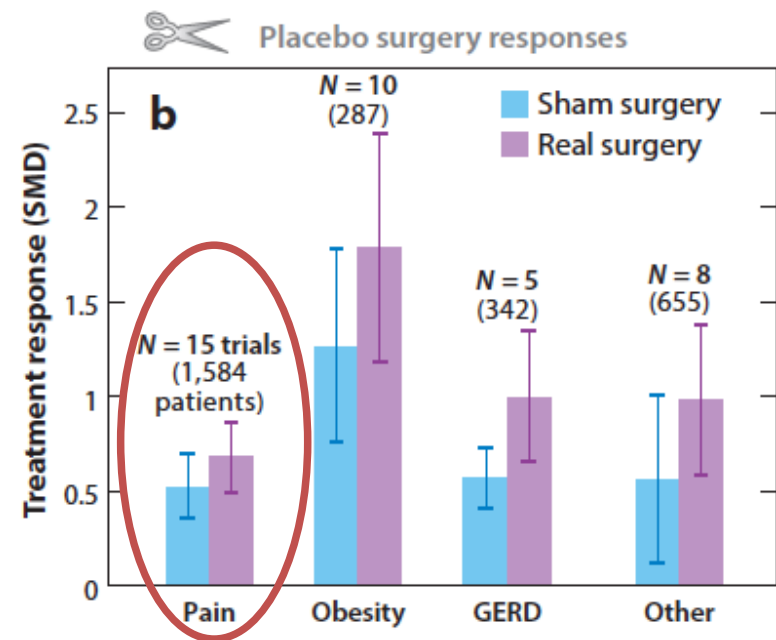
2002 2006 2010 2014 2018 2002 2006 2010 2014 2018
Year Year

Focus on Peripheral Structures

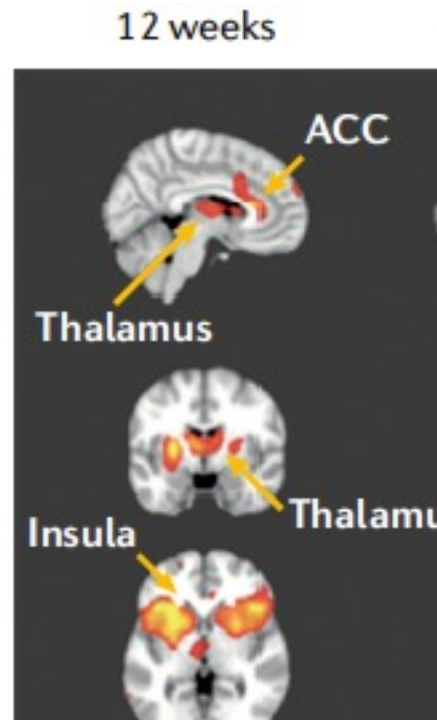
Peripheral imaging findings
weakly related to pain

Body Part	Prevalence in <u>ASYMPTOMATIC</u> populations
Back	Disc degeneration in 52% of people in 30's, 96% of people in 80's
Neck	87% have bulging discs
Shoulder	72% have superior labral tears
Hip	69% of adults (and 89% of athletes) have labral tears
Knee	97% of knees show "abnormalities"
Ankle & Foot	63% with Achilles tendon changes 68% of runners have retrocalcaneal changes

Many peripheral txs not
superior to sham



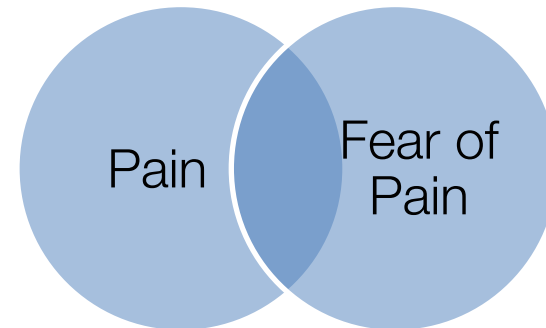
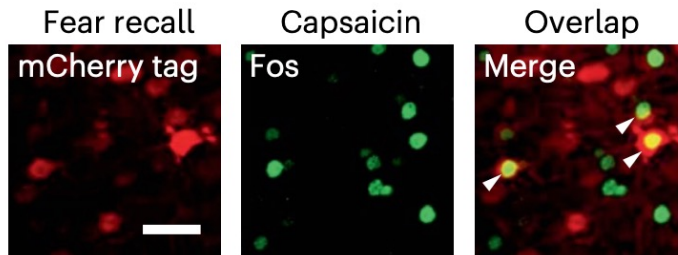
The Brain “Learns” Chronic Pain



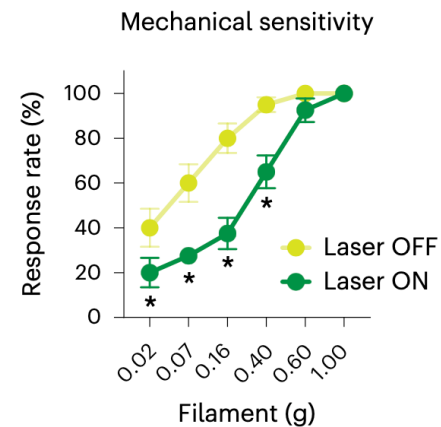
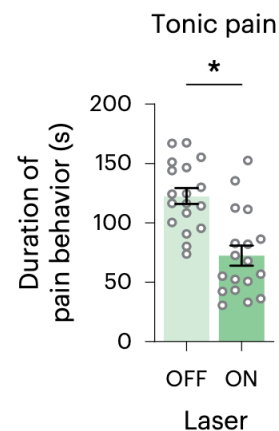
When pain transitions from acute to chronic, it shifts to learning and meaning related brain regions

Pain, Fear, and the Prefrontal Cortex

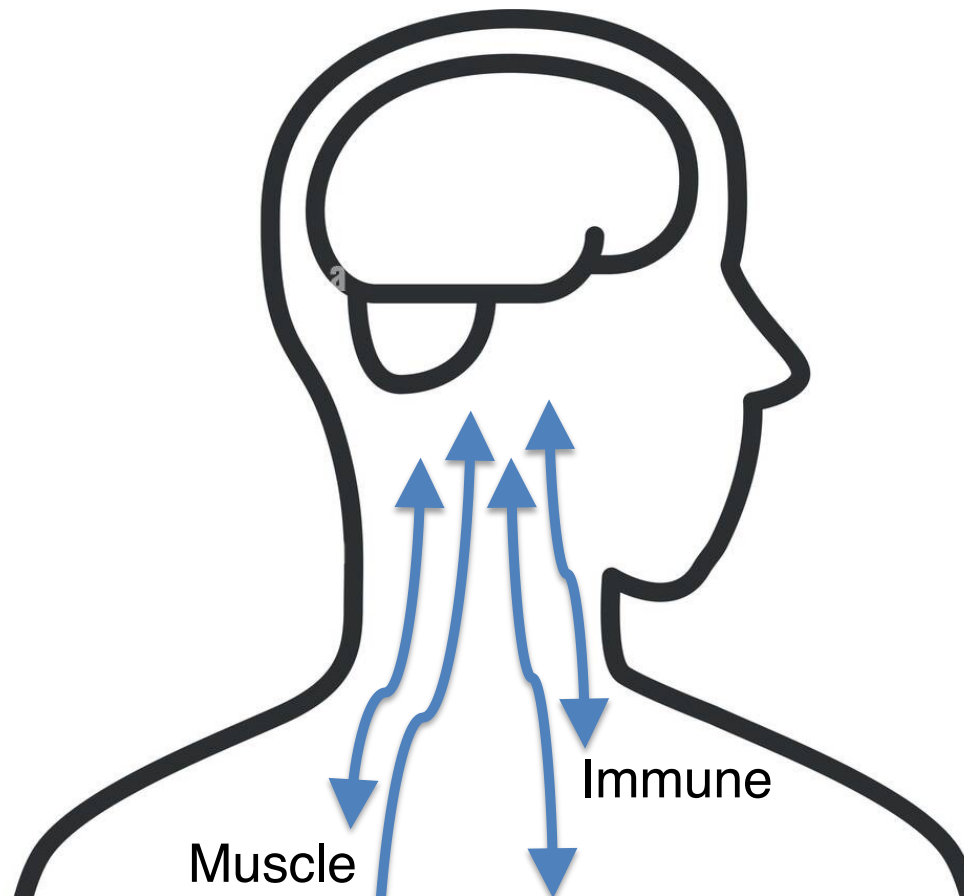
~30% overlap in prefrontal neurons



Optogenetic silencing of fear neurons reduces pain

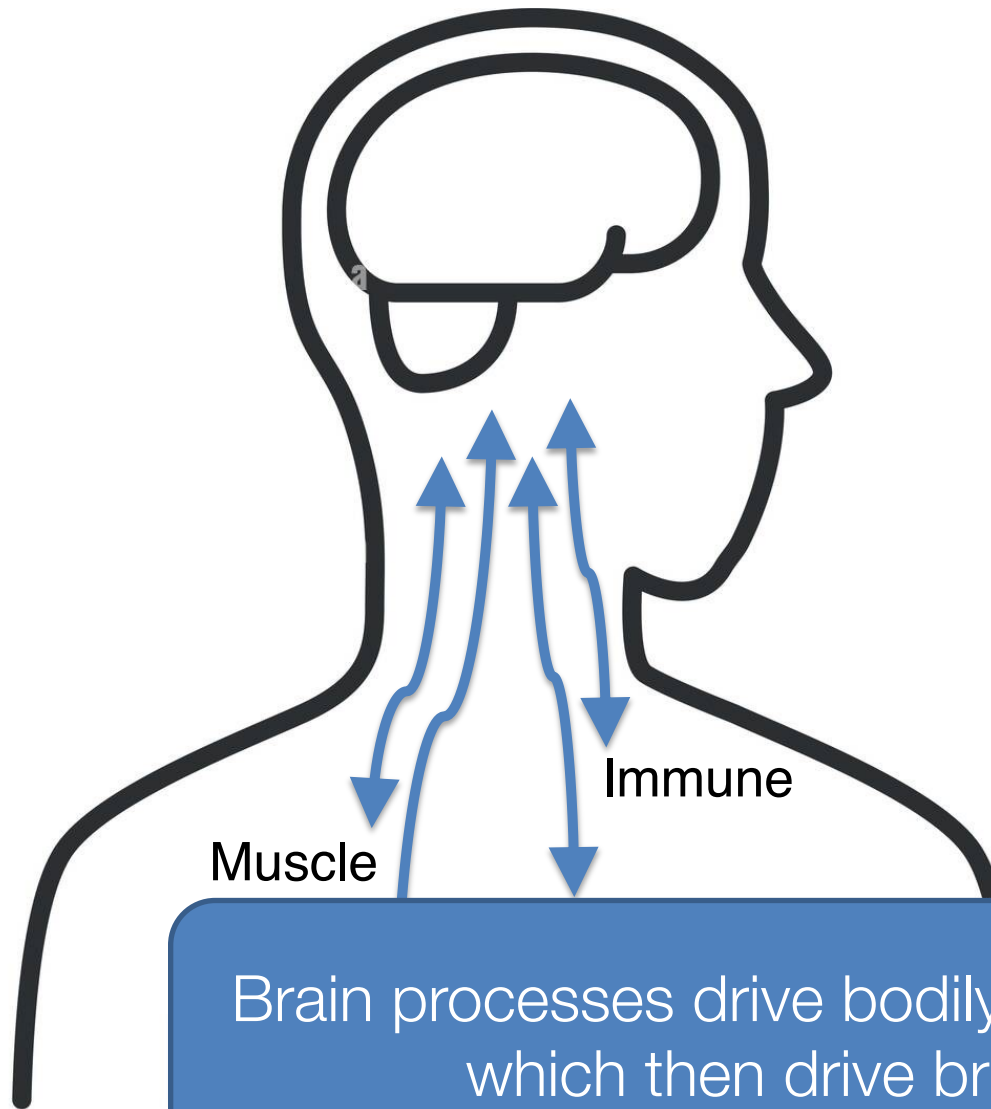


Brain-Body Interactions

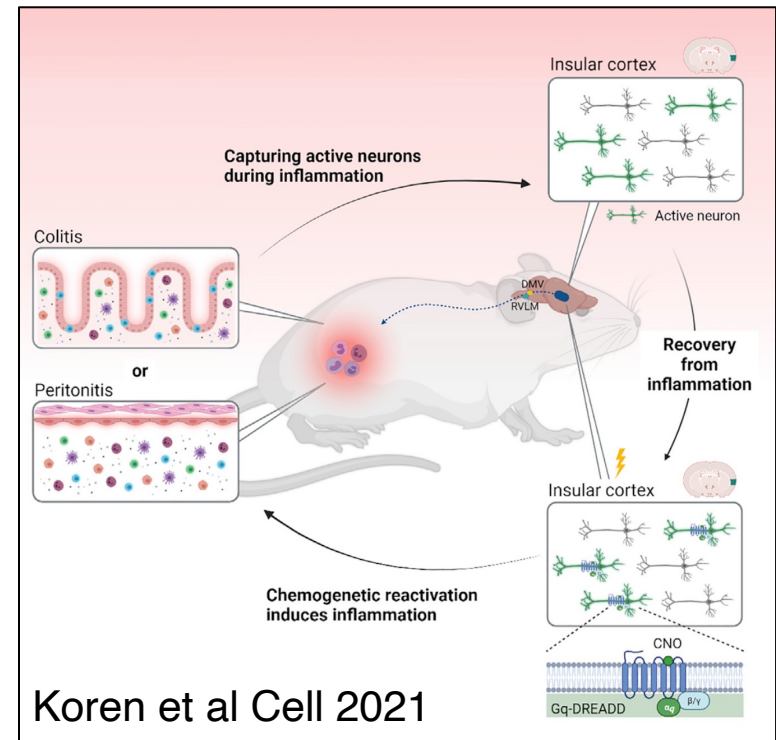


Brain processes drive bodily and behavioral changes,
which then drive brain changes, etc.

Brain-Body Interactions



Insula remembers and can induce inflammatory states



Koren et al Cell 2021

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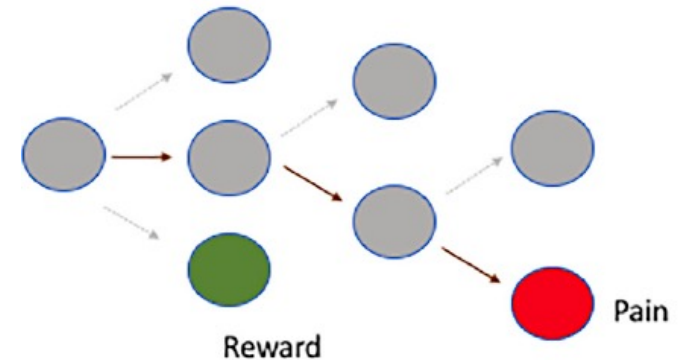
What is Pain, Anyways?



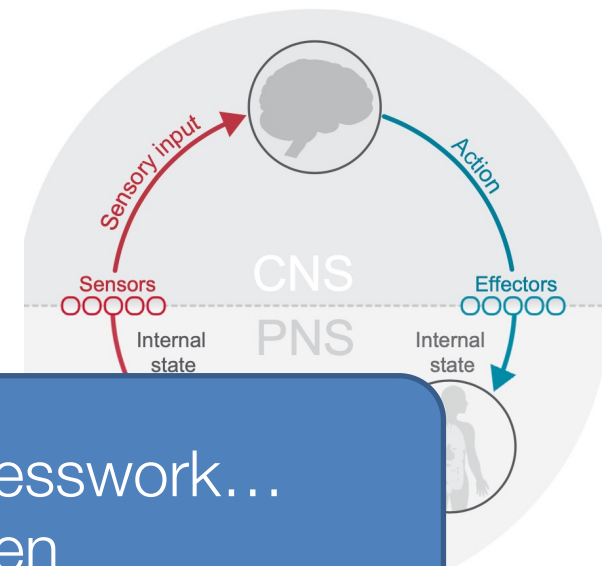
Rene Descartes, 1644

What is Pain, Anyways?

A learning signal for guiding
behavior



An inference about current
injury state



The brain is doing a lot of guesswork...
and it can be mistaken

Seymour et al, 2019; Kaptchuk et al., 2020; Buchel et al., 2014; Sterling, 2012; Feldman-Barrett, 2017; Petzschner et al., 2017; Vlaeyen 2000; Sullivan 2001; Wideman 2009; Kleckner 2017; Barrett 2015; Khalsa 2016

ICD-11 Pain Subtypes

	Primary Chronic Pain	Secondary Chronic Pain
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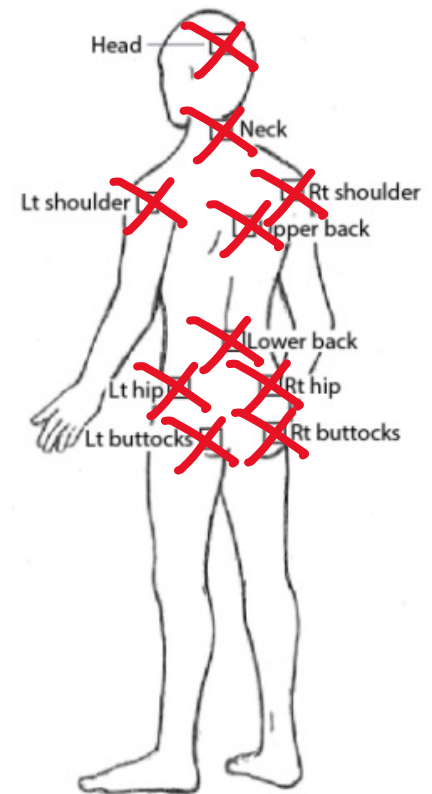
Central nervous
system contributions

Peripheral injury
contributions



A Method To Diagnose Primary Pain

- Rule out clear pathological cause
- Rule in criteria:
 - Onset during life stress
 - Symptoms move, spread over time
 - Thinking about pain makes it worse
 - Family history of chronic pain
 - History of multiple pain conditions
 - Conditioned associations



How Common is Primary Pain?

- $N = 222$ back/neck pain patients
- Community physiatry clinic in Louisiana

88% primary

6% mixed

6% secondary

When pain is primary...

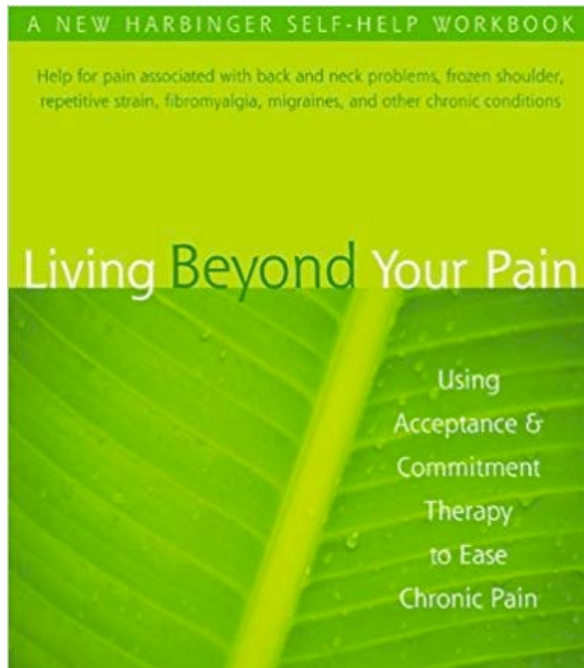
...Can it be resolved by
psychological treatment?

Leading Psychological Treatments

Typically provide pre-to-post pain reduction of 1 point on a 0 to 10 pain scale

Why?

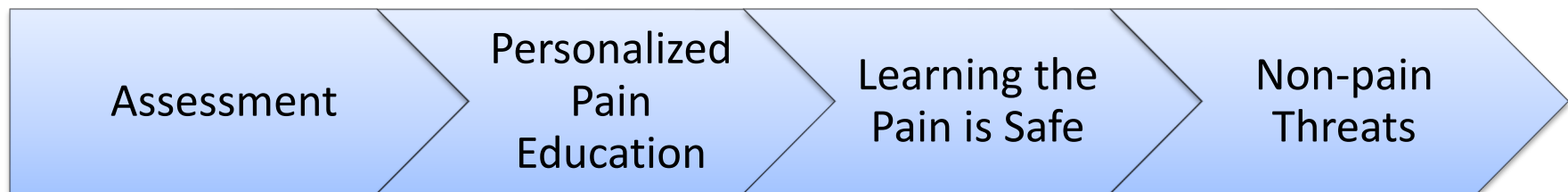
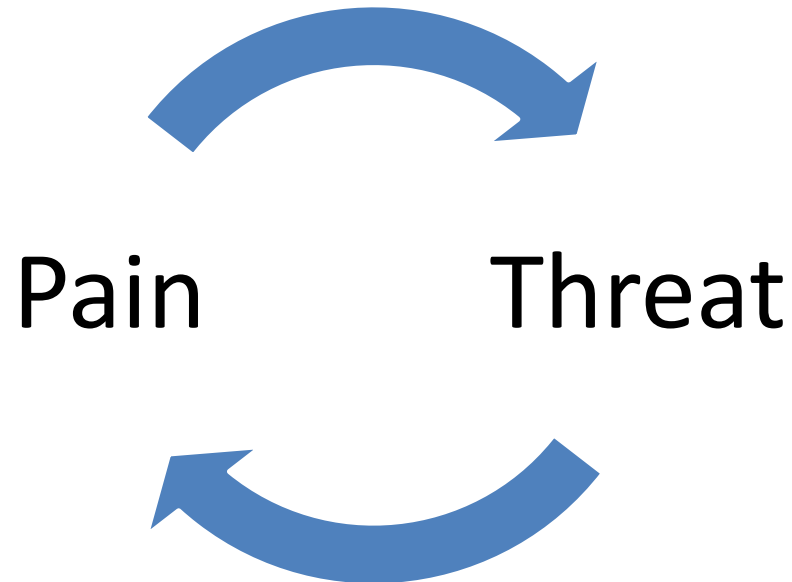
Leading Psychological Treatments



“[Pain] is usually an important message from the body alerting the brain that something’s wrong and needs attention.... This book will target the suffering caused by your pain, not the pain itself” (p. 8)

Leveraging insights in how pain and affect are constructed—can we do better?

Pain Reprocessing Therapy (PRT)



Developers of PRT: Alan Gordon, Christie Uipi, Howard Schubiner

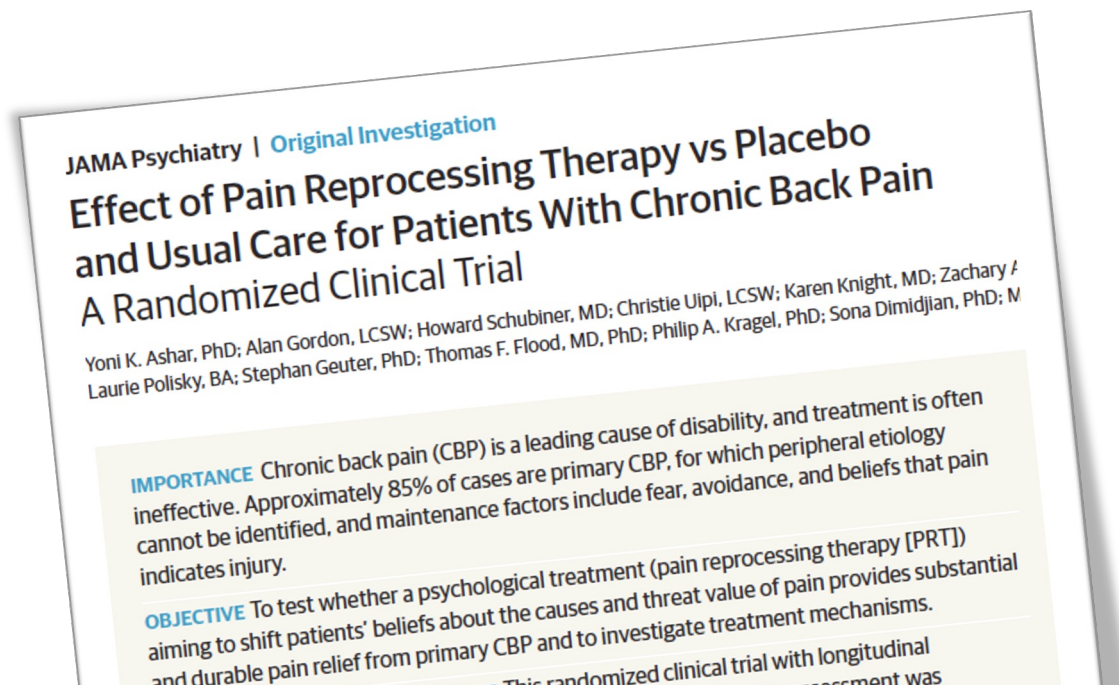
Ashar .. Wager, JAMA Psych 2022; Gordon & Ziv, 2022; Lumley & Schubiner, 2019

A (Dramatic) Snippet of PRT

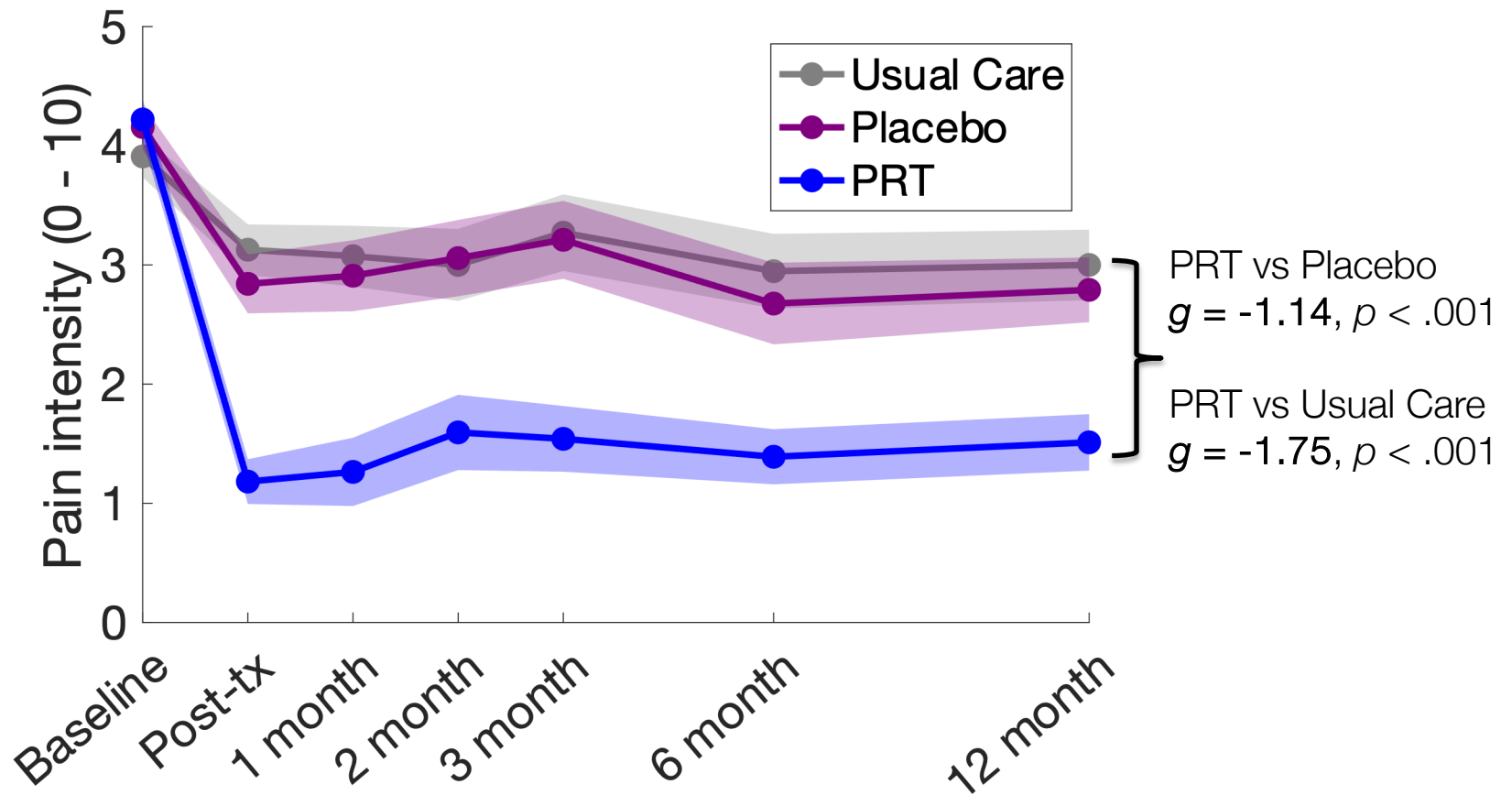


First Clinical Trial of PRT

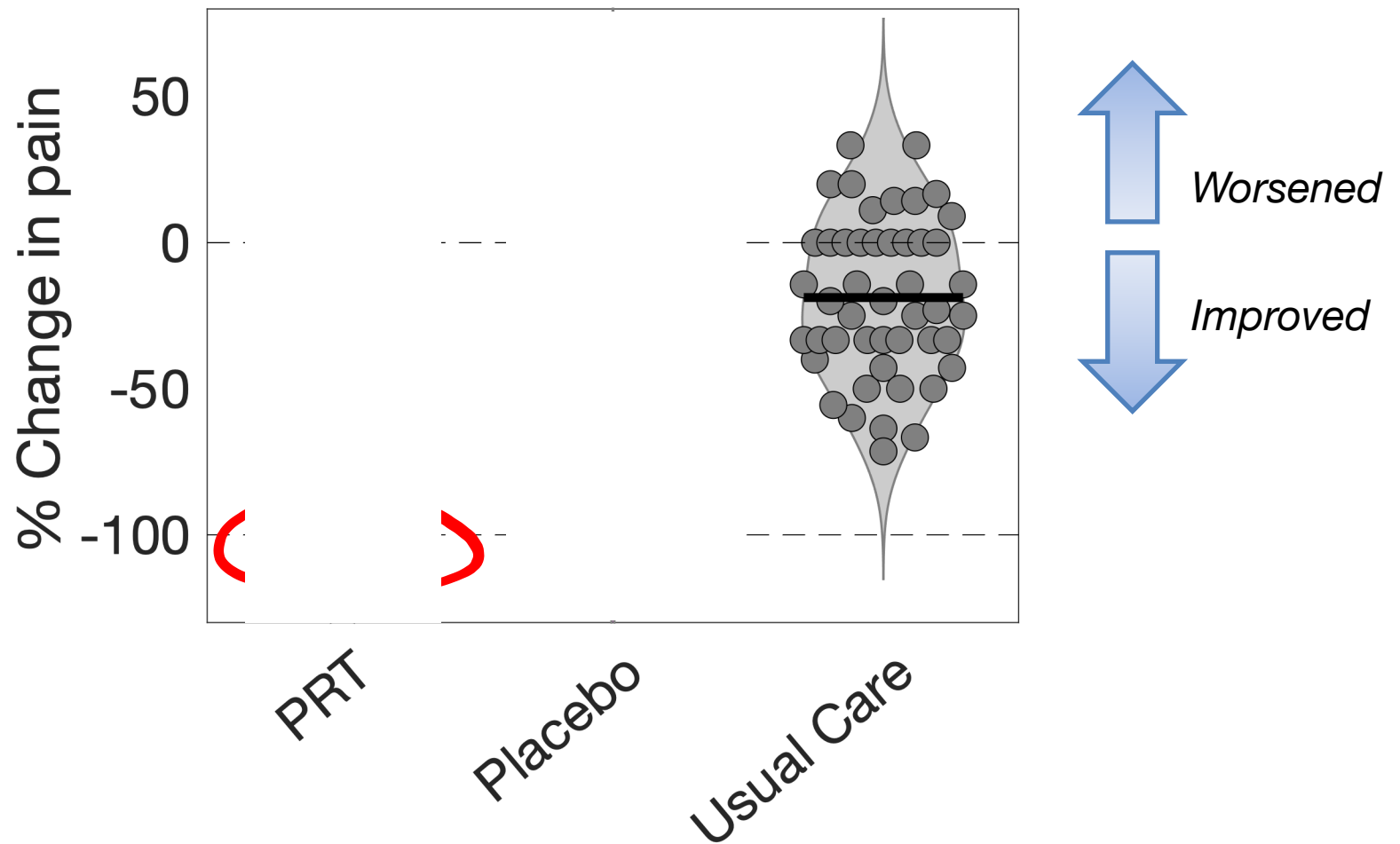
- N = 151 chronic back pain patients recruited from the Boulder, CO area
- PRT delivered in 9 sessions over 1 month



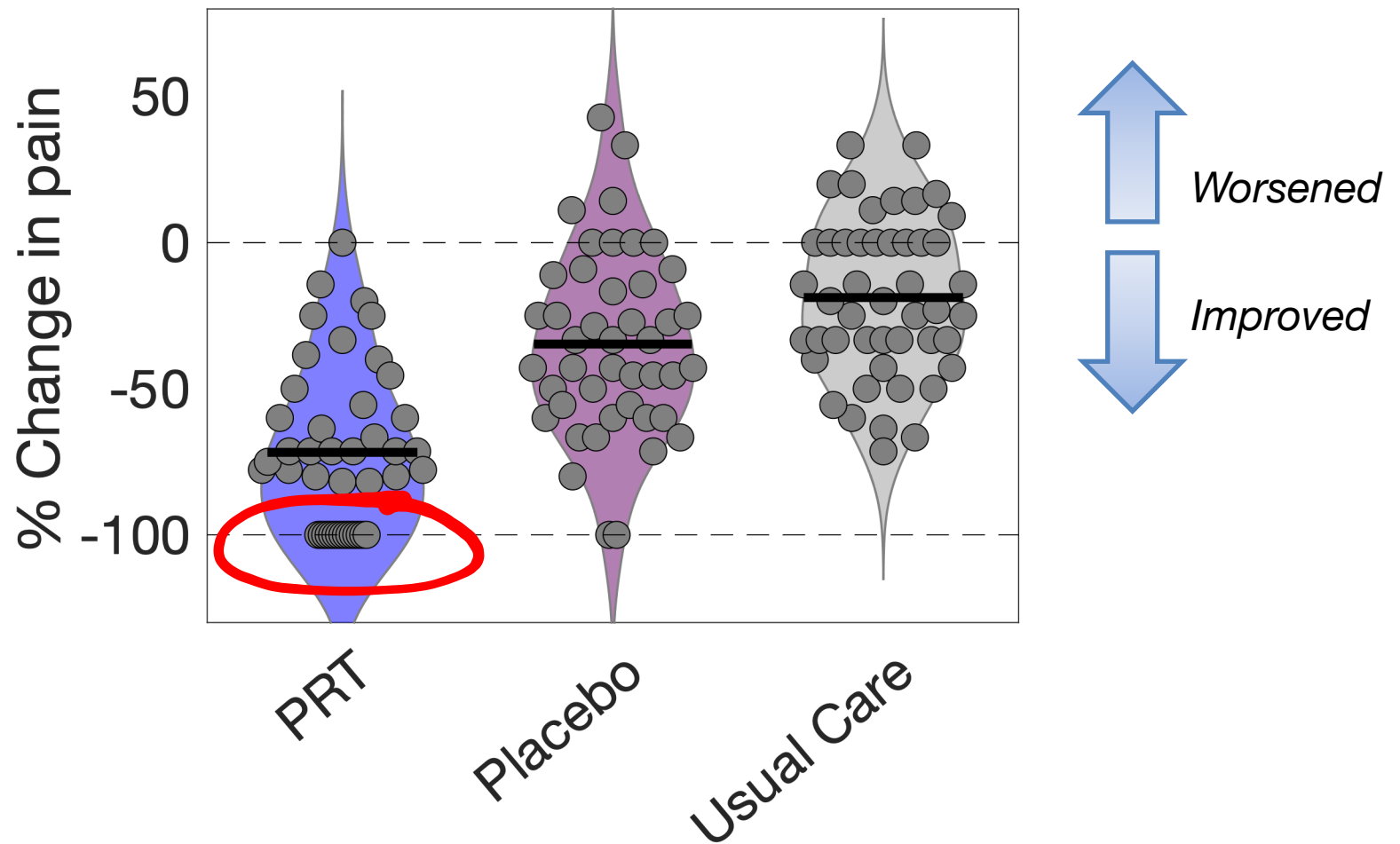
Last-week average pain intensity



Percent improvement in pain

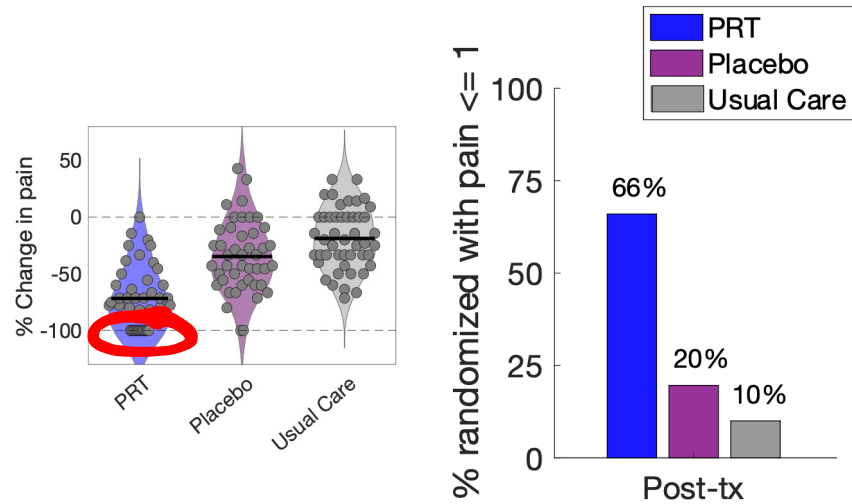


Percent improvement in pain



Percent improvement in pain

“Pain-free or nearly pain-free”



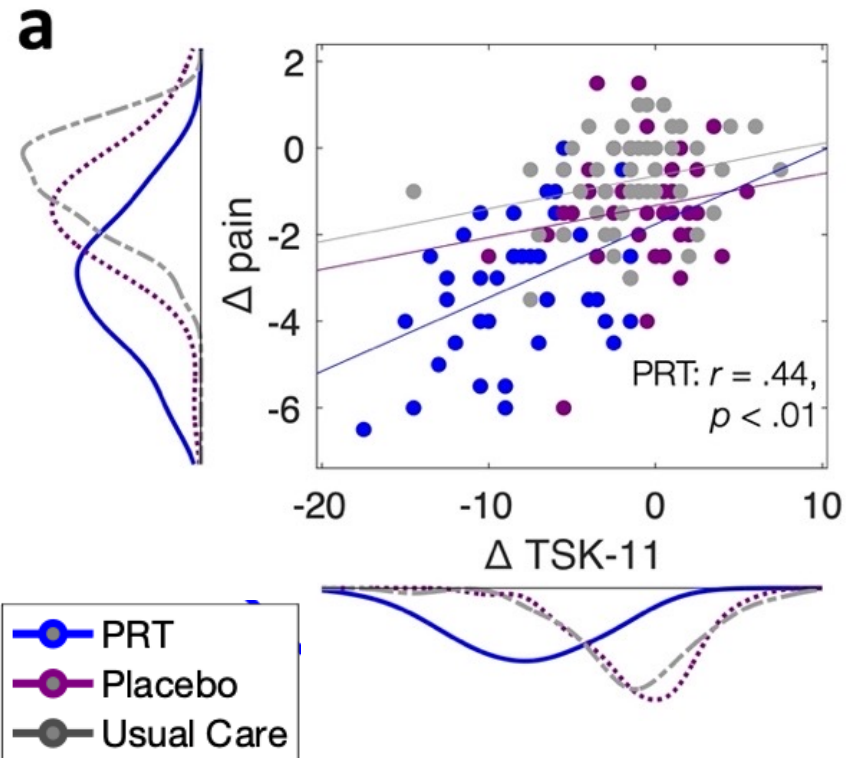
How did people get out of pain?

TSK-11

1. Reduced harm beliefs & activity avoidance

*Pain always means I have **injured my body***

*I'm **afraid I might injure** myself if I exercise*



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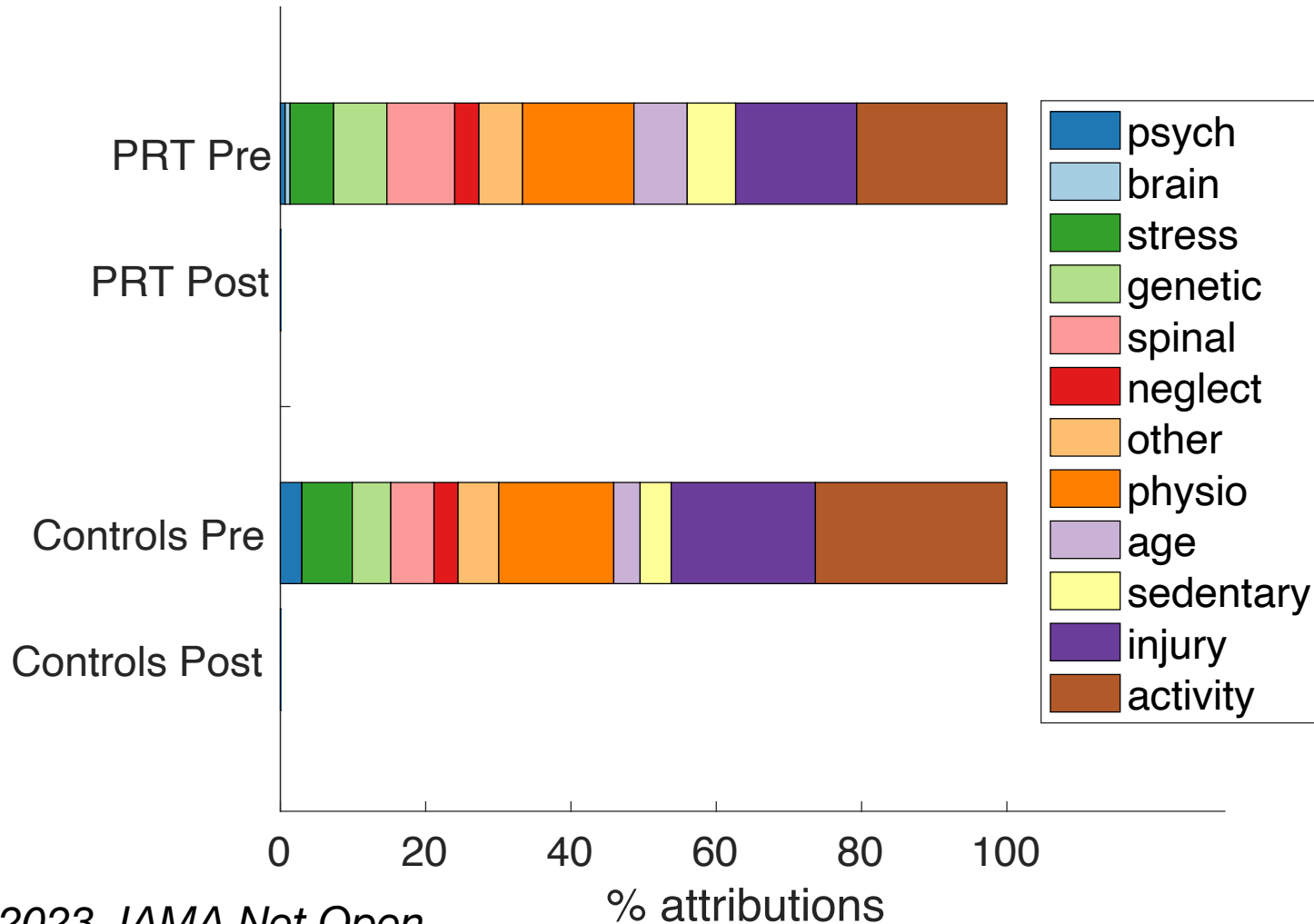
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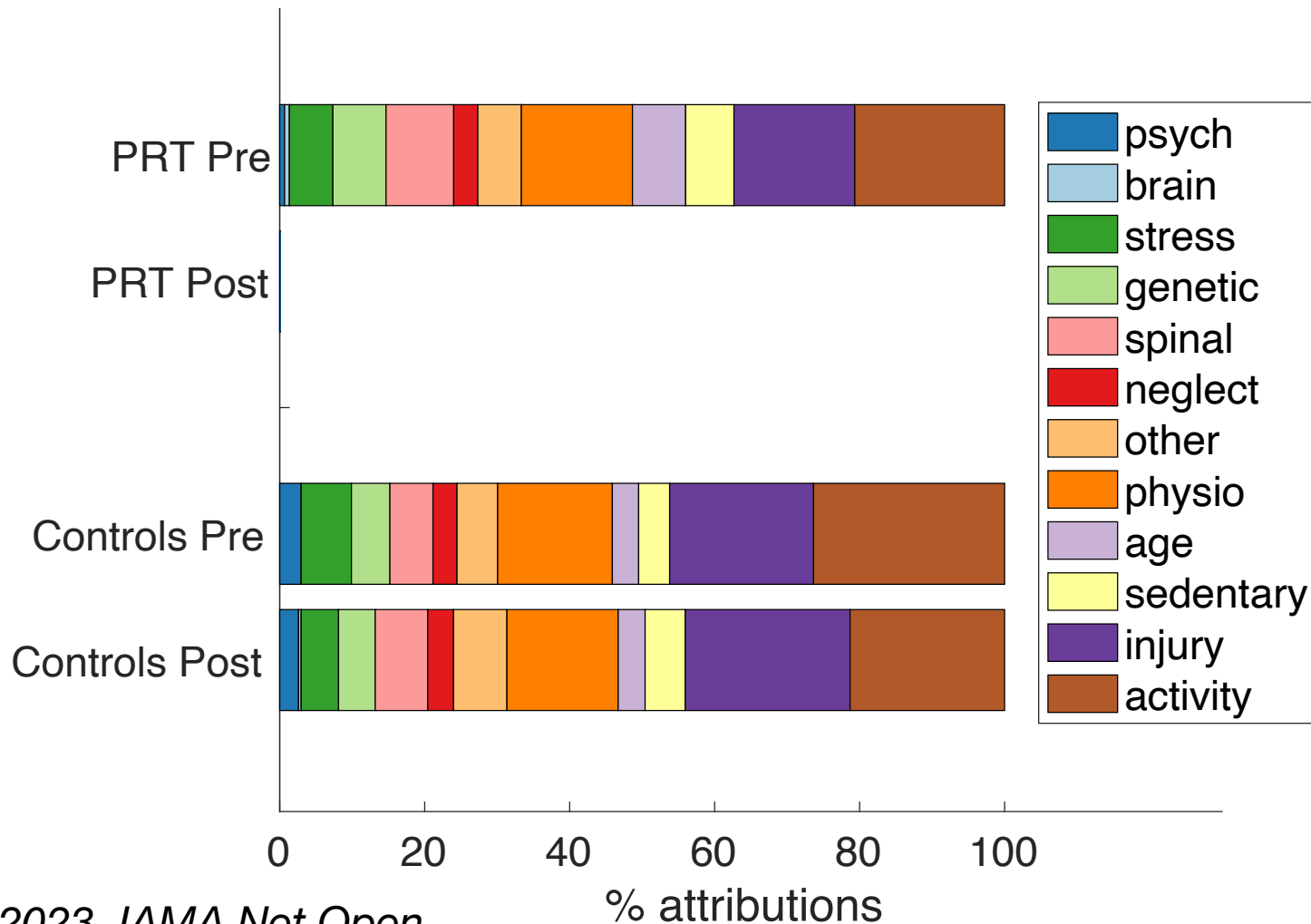
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2. Changing *pain attributions*



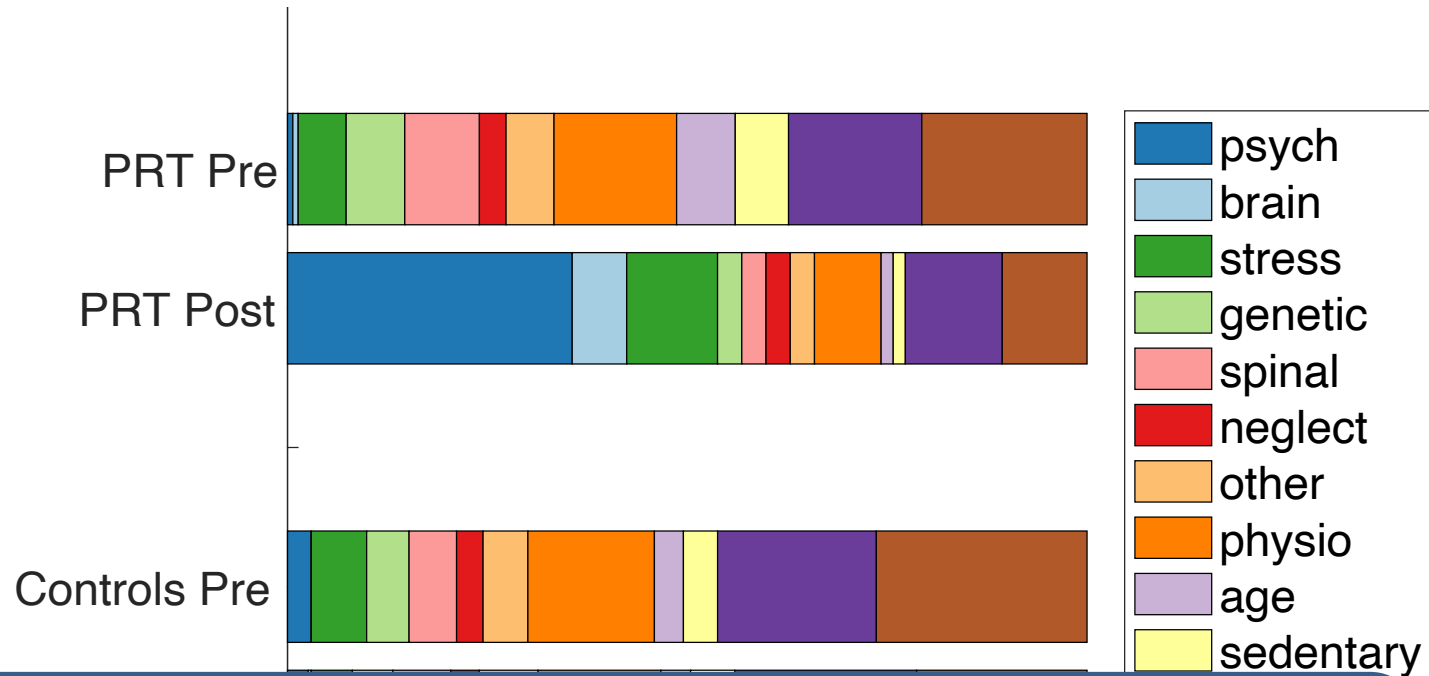
How did people get out of pain?

2. Changing *pain attributions*



How did people get out of pain?

2. Changing *perceived* causes of pain

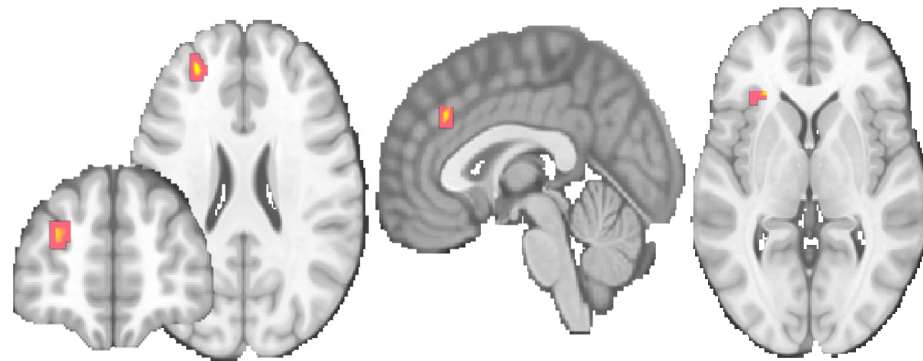


Larger attribution shifts toward mind/brain led to larger back pain reductions

How did people get out of pain?

3. Brain changes

PRT vs. control: reductions in brain responses to evoked back pain



Key Findings

- Psychological treatment can resolve a substantial portion of primary CBP cases
- Mechanisms include:
 - Reduction in fearful pain beliefs
 - Reattribution of sensations
 - Prefrontal and somatosensory pathways
 - Broader changes in emotional functioning

Next Steps

- Testing efficacy in a more representative chronic pain population
- Other pain conditions
- Scalable delivery formats
- Treatment mechanisms (biology & behavior)

Pain Clinic of the Future?

Primary
Pain

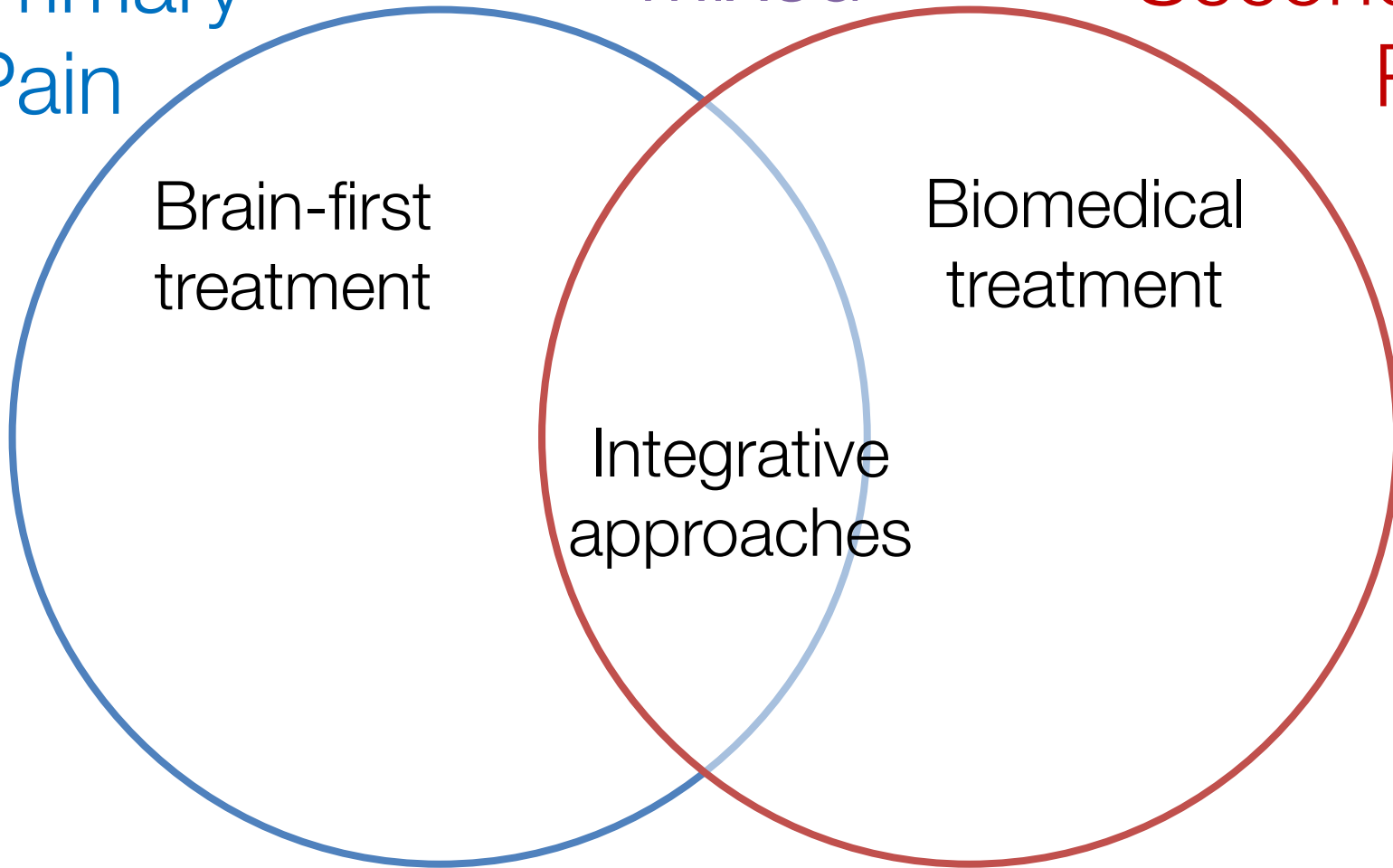
Mixed

Secondary
Pain

Brain-first
treatment

Biomedical
treatment

Integrative
approaches



Conclusions



- 50 million Americans with chronic pain
- Mind & brain contributions not adequately assessed or treated
- Can we do better?

Help us Recruit Study Participants!

- www.redcap.link/backpain
- Fully telehealth study

Jonathan Ashar, COMIRB 22-2162, 7.25.23



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BACK PAIN?



Participate in a research study (up to \$165) on the effects of **mind-body treatments** on chronic back pain. Participate from **anywhere in the U.S** on this virtual study!

How can my patients access PRT?

- Directory of Practitioners
 - www.painreprocessingtherapy.com
- Zoom therapy options
 - Pain Psychology Center
 - Better Mind Center
- Self-help
 - *The Way Out*, by Gordon & Ziv
 - Curable app
- Lin Health
 - Digitally-supporting pain recovery coaching
 - Can integrate with providers
 - Accepts insurance



Foundation for
the Science of
the Therapeutic
Encounter



Thank You



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