

GUIDING INDIVIDUALS LIVING WITH CHRONIC PAIN TOWARDS IMPROVED PSYCHOLOGICAL FLEXIBILITY

J. Bruce Hillenberg, Ph.D., ABPP

Board-Certified in Clinical Health Psychology

Private Practice: Bloomfield Hills, MI

President, Midwest Pain Society

COI

- I have no conflicts of interest to report

Learning Objectives

- Identify the prevalence of chronic pain and those factors that increase the risk of disability
- Explain how pain-related disability is significantly determined by a person's psychological response to their pain and underlying condition
- Describe the multiple factors that can influence a person's experience of pain
- Understand why coordination of care is essential as pain persists and its impact grows
- Identify the unique challenges in caring for individuals with high impact pain
- Describe the steps an individual must take to decrease the limitations associated with chronic pain

Be Still, Be Courageous, Be Open, Be Grateful!

The warriors challenge in living with chronic pain. There are two paths—one with heart, one with fear. The choice of paths is monumental.



How Big a Problem is Chronic Pain?

Child and Adolescents: 20-25%

Adults: 37-41%

Adults (50>): 50%

Elderly in Care Facilities: 75-85%

Pain is the most common reason for medical care

Bruns, D., 2019, APA Conference, Chronic Pain Treatment and the Opioid Crisis: A Science-Based Interdisciplinary Approach

Jacobs et al, (2016), *British Journal of Pain*, 10(1), 38-45

Jensen & Turk, (2014), *American Psychologist*, 62(2), 105-118

Molton & Terrill, (2014), *American Psychologist*, 69(2), 197-207

Perquin et al, (2000), *Pain*, 87(1), 51-58

Significant Healthcare Costs



RESEARCH
EDUCATION
TREATMENT
ADVOCACY



The Journal of Pain, Vol 13, No 8 (August), 2012: pp 715-724
Available online at www.jpain.org and www.sciencedirect.com

Focus Article

The Economic Costs of Pain in the United States

Darrell J. Gaskin* and Patrick Richard†

*Hopkins Center for Health Disparities Solutions, and Department of Health Policy and Management, Johns Hopkins Bloomberg School of Public Health, Johns Hopkins University, Baltimore, Maryland.

†Department of Preventive Medicine and Biometrics, Uniformed Services University of the Health Sciences, Bethesda, Maryland.

Abstract: In 2008, according to the Medical Expenditure Panel Survey (MEPS), about 100 million adults in the United States were affected by chronic pain, including joint pain or arthritis. Pain is costly to the nation because it requires medical treatment and complicates treatment for other ailments. Also, pain lowers worker productivity. Using the 2008 MEPS, we estimated 1) the portion of total U.S. health care costs attributable to pain; and 2) the annual costs of pain associated with lower worker productivity. We found that the total costs ranged from \$560 to \$635 billion in 2010 dollars. The additional health care costs due to pain ranged from \$261 to \$300 billion. This represents an increase in annual per person health care costs ranging from \$261 to \$300 compared to a base of about \$4,250 for persons without pain. The value of lost productivity due to pain ranged from \$299 to \$335 billion. We found that the annual cost of pain was greater than the annual costs of heart disease (\$309 billion), cancer (\$243 billion), and diabetes (\$188 billion). Our estimates are conservative because they do not include costs associated with pain for nursing home residents, children, military personnel, and persons who are incarcerated.

Perspective: This study estimates that the national cost of pain ranges from \$560 to \$635 billion, larger than the cost of the nation's priority health conditions. Because of its economic toll on society, the nation should invest in research, education, and training to advocate the successful treatment, management, and prevention of pain.

© 2012 by the American Pain Society

Key words: Cost of illness, chronic pain, persistent pain.

US National Pain Strategy



RESEARCH
EDUCATION
TREATMENT
ADVOCACY



The Journal of Pain, Vol 17, No 10 (October), 2016: pp 1068-1080
Available online at www.jpain.org and www.sciencedirect.com

United States National Pain Strategy for Population Research: Concepts, Definitions, and Pilot Data



Michael Von Korff,^{*} Ann I. Scher,[†] Charles Helmick,[‡] Olivia Carter-Pokras,[§]
David W. Dodick,[¶] Joseph Goulet,^{||} Robin Hamill-Ruth,^{**} Linda LeResche,^{††} Linda Porter,^{‡‡}
Raymond Tait,^{§§} Gregory Terman,^{¶¶} Christin Veasley,^{|||} and Sean Mackey^{***}

^{*}Group Health Research Institute, Seattle, Washington.

[†]Department of Preventive Medicine and Biostatistics, Uniformed Services University of the Health Sciences, Bethesda, Maryland.

[‡]Centers for Disease Control and Prevention, Atlanta, Georgia.

[§]University of Maryland School of Public Health, College Park, Maryland.

[¶]Mayo Clinic College of Medicine, Phoenix, Arizona.

^{||}Yale University School of Medicine, New Haven, Connecticut.

^{**}University of Virginia Health System, Charlottesville, Virginia.

^{††}University of Washington School of Dentistry, Seattle, Washington.

^{‡‡}National Institute of Neurological Disorders and Stroke, National Institutes of Health, Bethesda, Maryland.

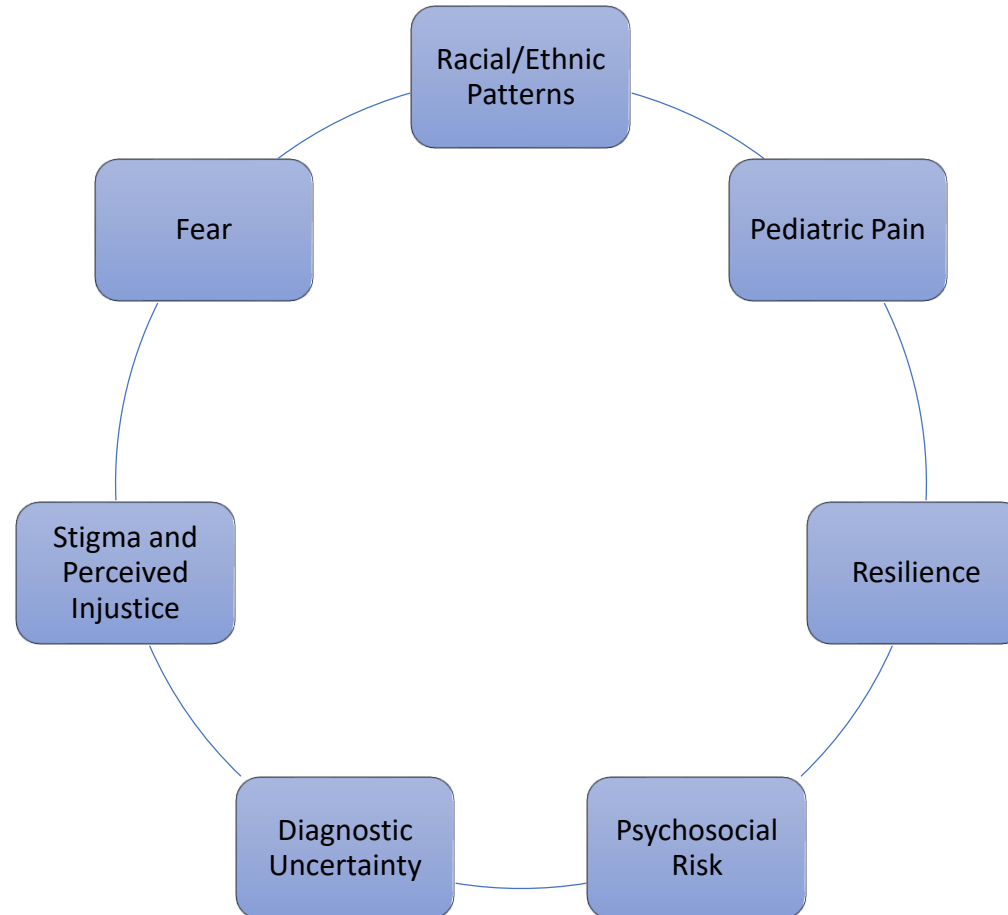
^{§§}Department of Psychiatry, St. Louis University School of Medicine, St. Louis, Missouri.

^{¶¶}University of Washington School of Medicine, Seattle, Washington.

^{|||}Chronic Pain Research Alliance, Milwaukee, Wisconsin.

^{***}Stanford University School of Medicine, Palo Alto, California.

Hot Research Topics in Pain Management



Other topics receiving attention:

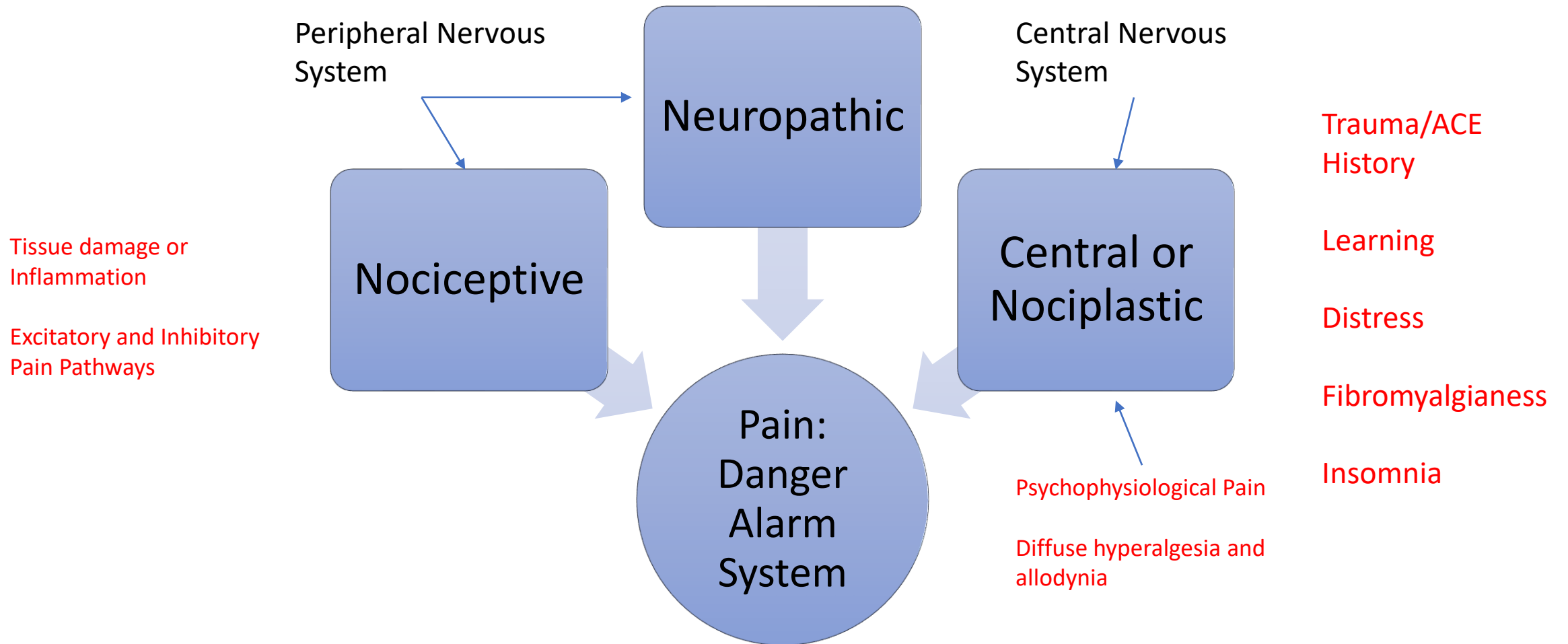
- Couples and families
- Coping
- Opioids
- Pre-surgery risk
- System approaches
- PTSD/Pain
- High-impact chronic pain

Journal of Pain
Health Psychology
2016-2019

Pain Drivers

An aversive sensory and emotional experience, typically caused by, or resembling that caused by, actual or potential tissue injury (IASP, 2019)

Damage or dysfunction of peripheral nerves

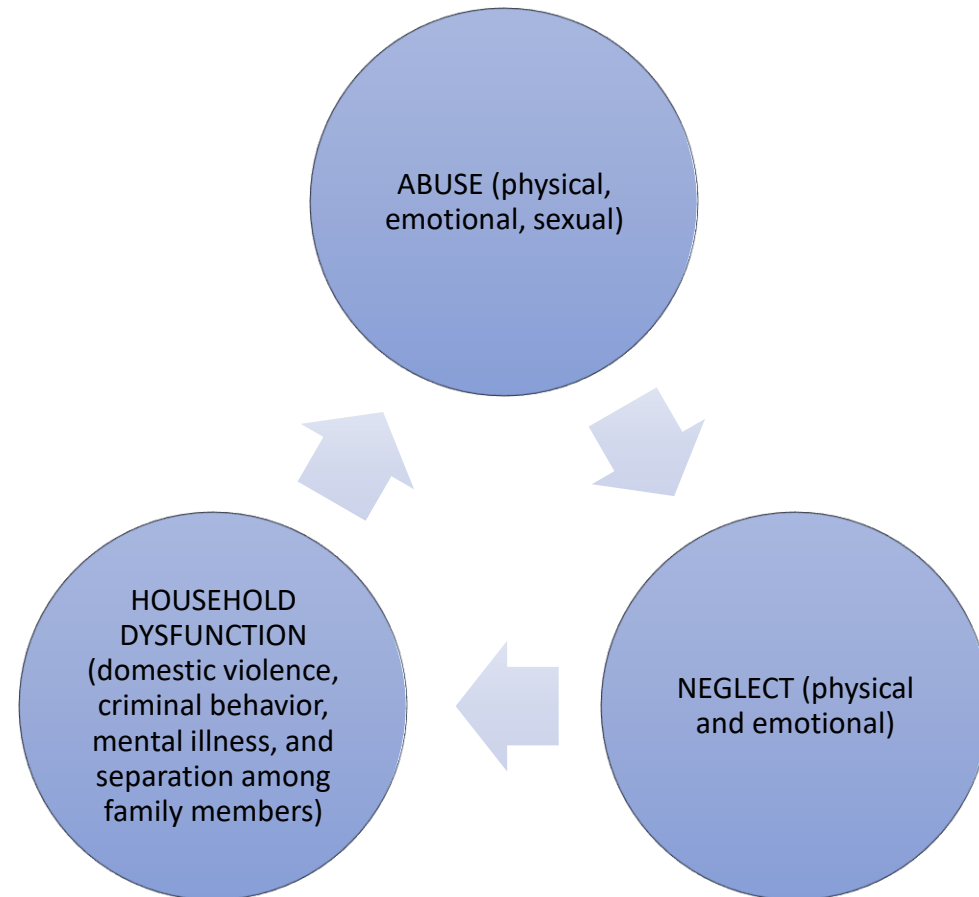


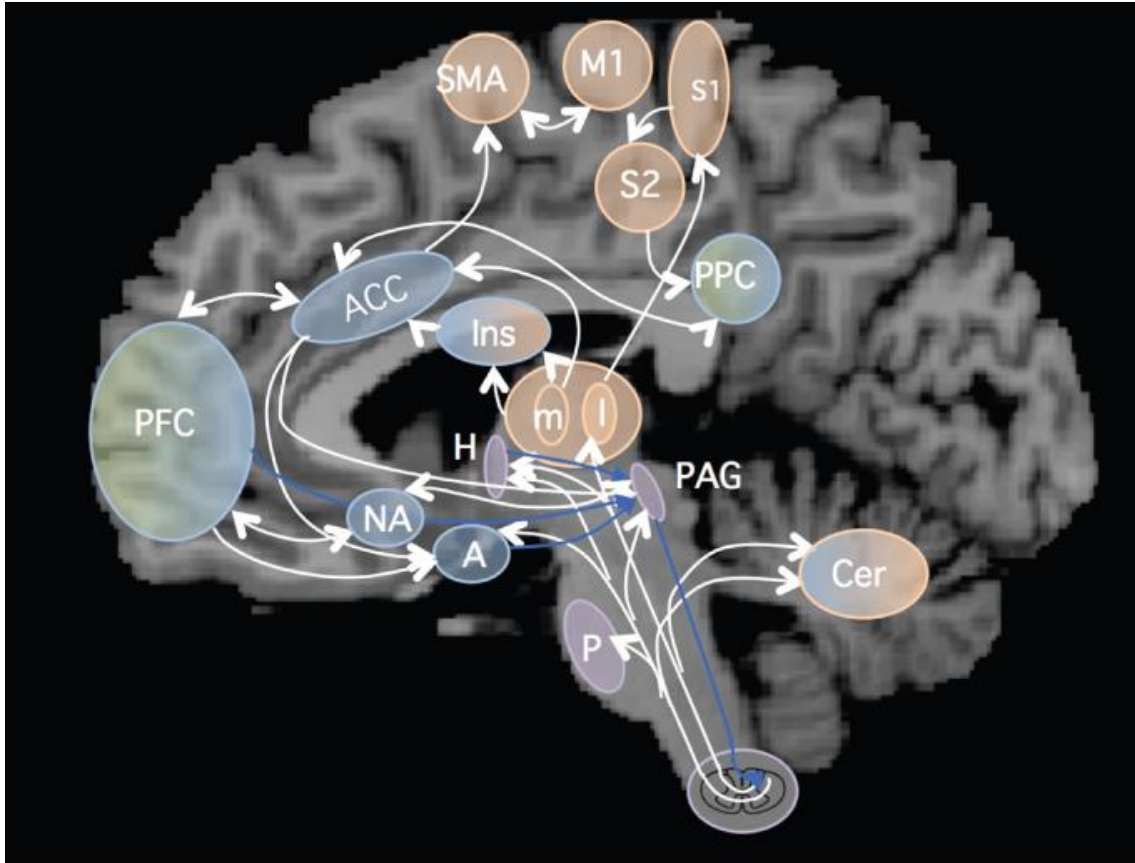
Adverse Childhood Events

Adverse childhood events (ACEs) are characterized as traumatic life events occurring before age eighteen.

Increased risk of physical/MH dx

Dose response risk



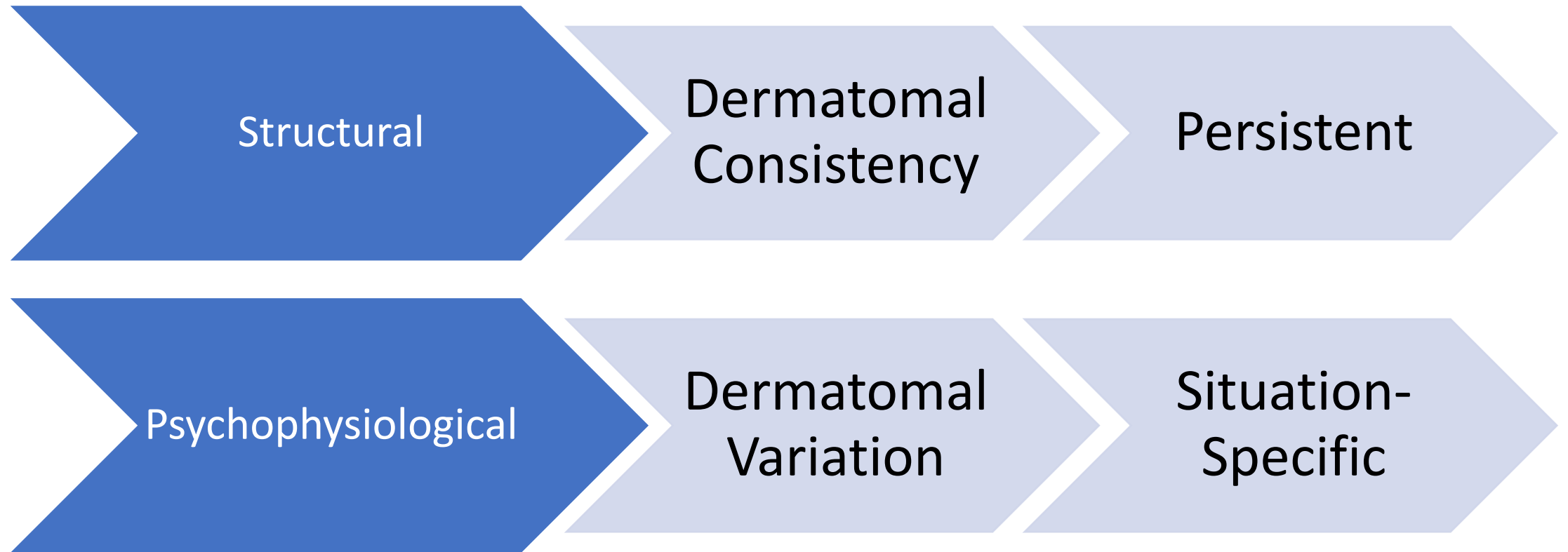


Source: Waxman SG: *Clinical Neuroanatomy: Twenty-Seventh Edition*:
www.accessmedicine.com
 Copyright © The McGraw-Hill Companies, Inc. All rights reserved.

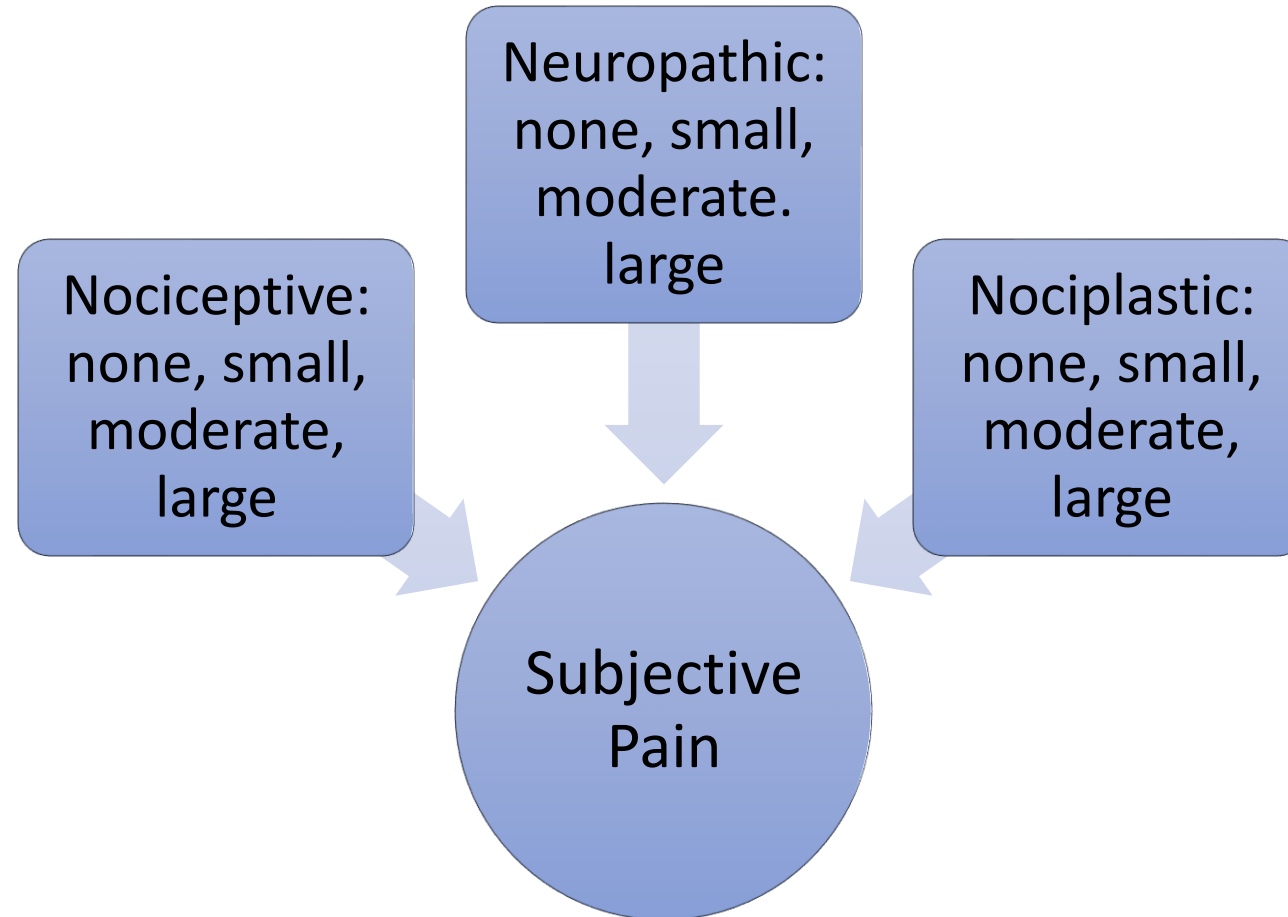
Nociplastic Pain Drivers

Pain-Volume Control Switch or Pain Matrix

Pain Patterns



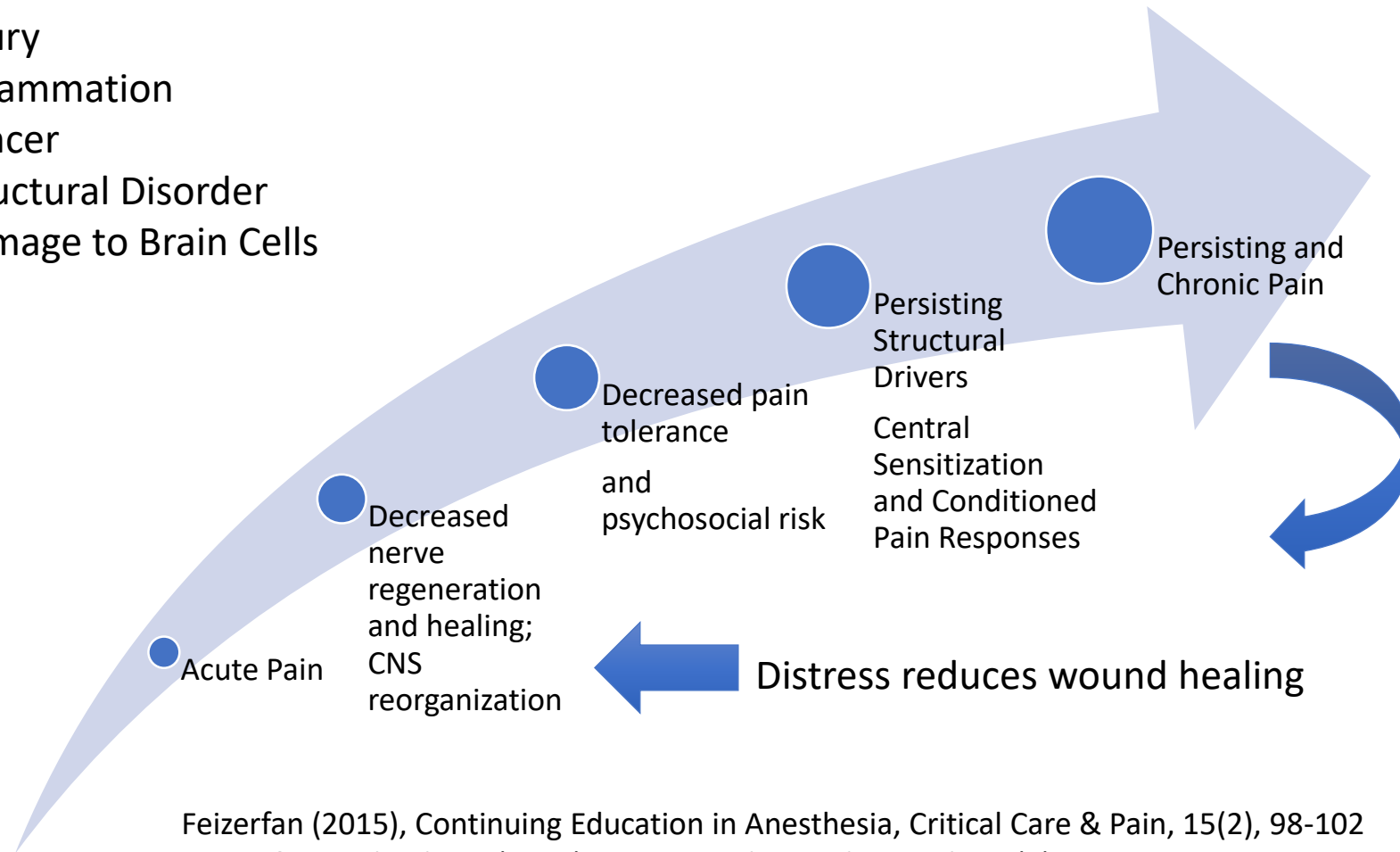
Chronic Pain: Combined Conditions



Imaging and physical exams are not effective predictors of the percent contributions or subjective pain

Identifiable Tissue Damage and Persisting Pain

Injury
Inflammation
Cancer
Structural Disorder
Damage to Brain Cells



Feizerfan (2015), Continuing Education in Anesthesia, Critical Care & Pain, 15(2), 98-102
Gouin & Kiecolt-Glaser (2011), Immuno, Alergy, Clin North, 31(1), 81-93

Psychophysiological/Central Pain

Affective/Motivational Processing: anterior cingulate cortex, amygdala, periaqueductal gray, anterior insula, and nucleus accumbens

Cognitive Modulation: frontal cortex and anterior cingulate cortex

Voluntary and Involuntary Muscles
Inflammation
Central Amplification

Continuum of conscious
and unconscious central
pain drivers!

Learned cognitive,
behavioral and
interpersonal factors-
low trauma load,
insightful and healthy
attachments
(Kinesiophobia)

Difficulty identifying,
experiencing and
expressing
emotions—higher
trauma load, more
emotional conflicts,
increase attachment
problems, and
poorer insight

Flor, 2014, American Psychologist, 69(2), 188-196; Jensen & Turk, 2014, American Psychologist, 68(2), 105-118

Abbass & Schubiner, 2018, Hidden from View: A Clinician's Guide to Psychophysiological Disorders, Psychophysiological Press: Pleasant Ridge

Table 1**Incidence of CPSP, severe CPSP, and proportion of neuropathic pain in CPSP.**

Type of surgery	Incidence of all CPSP	Incidence of severe CPSP (>5/10 of 10/10)	Proportion of neuropathic pain in CPSP
Amputation	30%–85%	5%–10%	80%
Caesarean delivery	6%–55%	5%–10%	50%
Cholecystectomy	3%–50%	Not reported	Not reported
Coronary bypass	30%–50%	5%–10%	Not reported
Craniotomy	7%–30%	25%	Not reported
Dental surgery	5%–13%	Not reported	Not reported
Hip arthroplasty	27%	6%	Not reported
Inguinal herniotomy	5%–63%	2%–4%	80%
Knee arthroplasty	13%–44%	15%	6%
Melanoma resection	9%	Not reported	Not reported
Mastectomy	11%–57%	5%–10%	65%
Sternotomy	7%–17%	Not reported	Not reported
Thoracotomy	5%–65%	10%	45%
Vasectomy	0%–37%	Not reported	Not reported

Compiled from multiple sources including Refs. 9,14,22.
CPSP, chronic postsurgical pain.

Table 2**Risk factors for CPSP by time line and domain.**

Domain of risk factor	Preoperative period	Intraoperative period	Postoperative period
Demographic	Age Sex Others	N/A	N/A
Genetic	Multiple mutations	N/A	N/A
Psychological	Depression Psychological vulnerability Stress Anxiety Catastrophising	N/A	Depression Psychological vulnerability Stress Anxiety Catastrophising Poor coping skills
Pain	Preoperative chronic pain Preoperative opioid use Increased sensitivity to experimental pain Increased temporal summation Decreased CPM	N/A	Severe acute pain Acute neuropathic pain Acute secondary hyperalgesia
Surgical	N/A	Type of surgery Nerve injury Longer duration of surgery Traumatic approaches	Need for repeated revisions
Clinical	Severity and numbers of comorbidities Disability	N/A	Radiotherapy Chemotherapy

Compiled from multiple sources including Refs. 13,22,26.

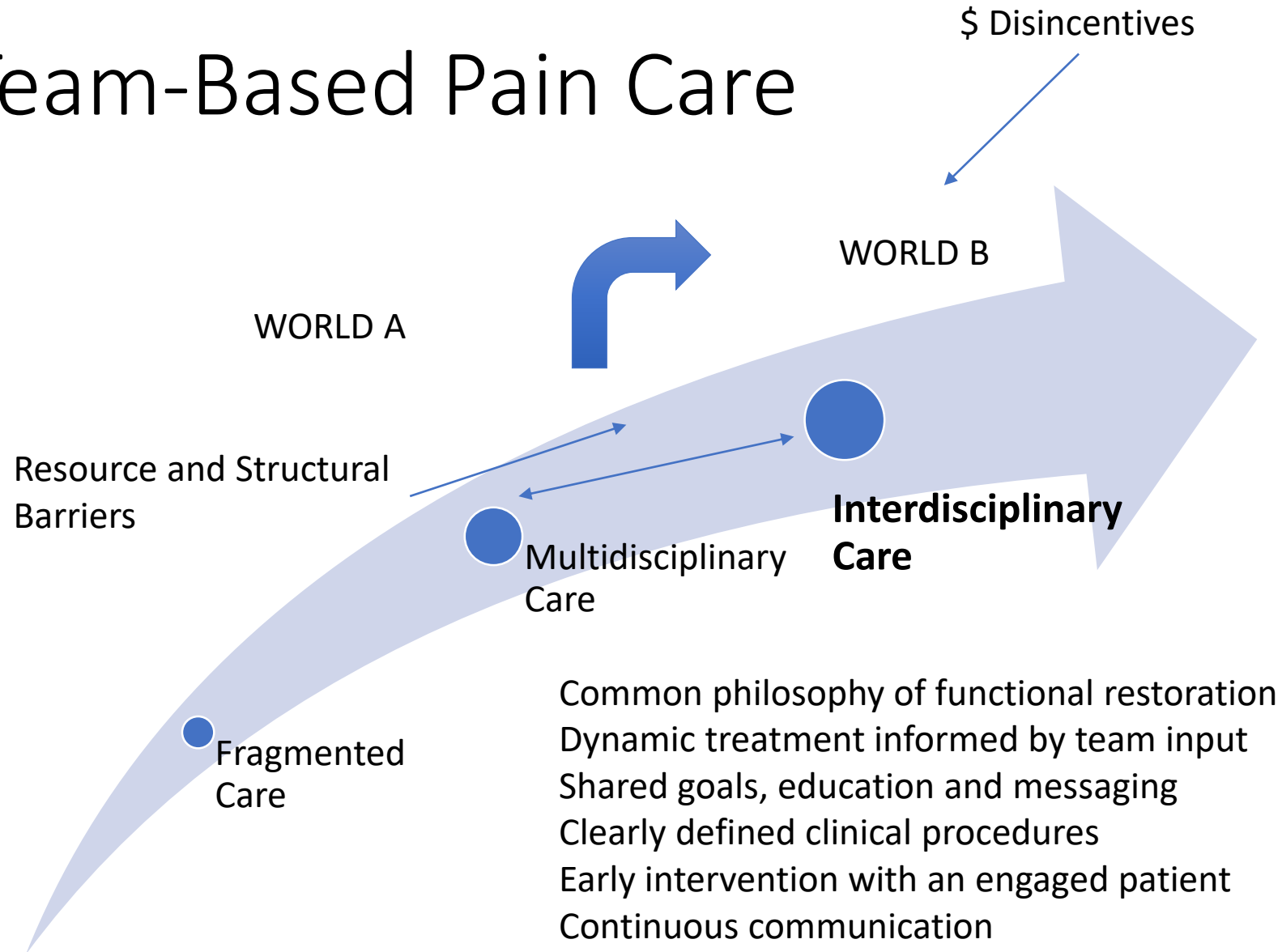
CPM, conditioned pain modulation; CPSP, chronic postsurgical pain.

Demographics of Pain

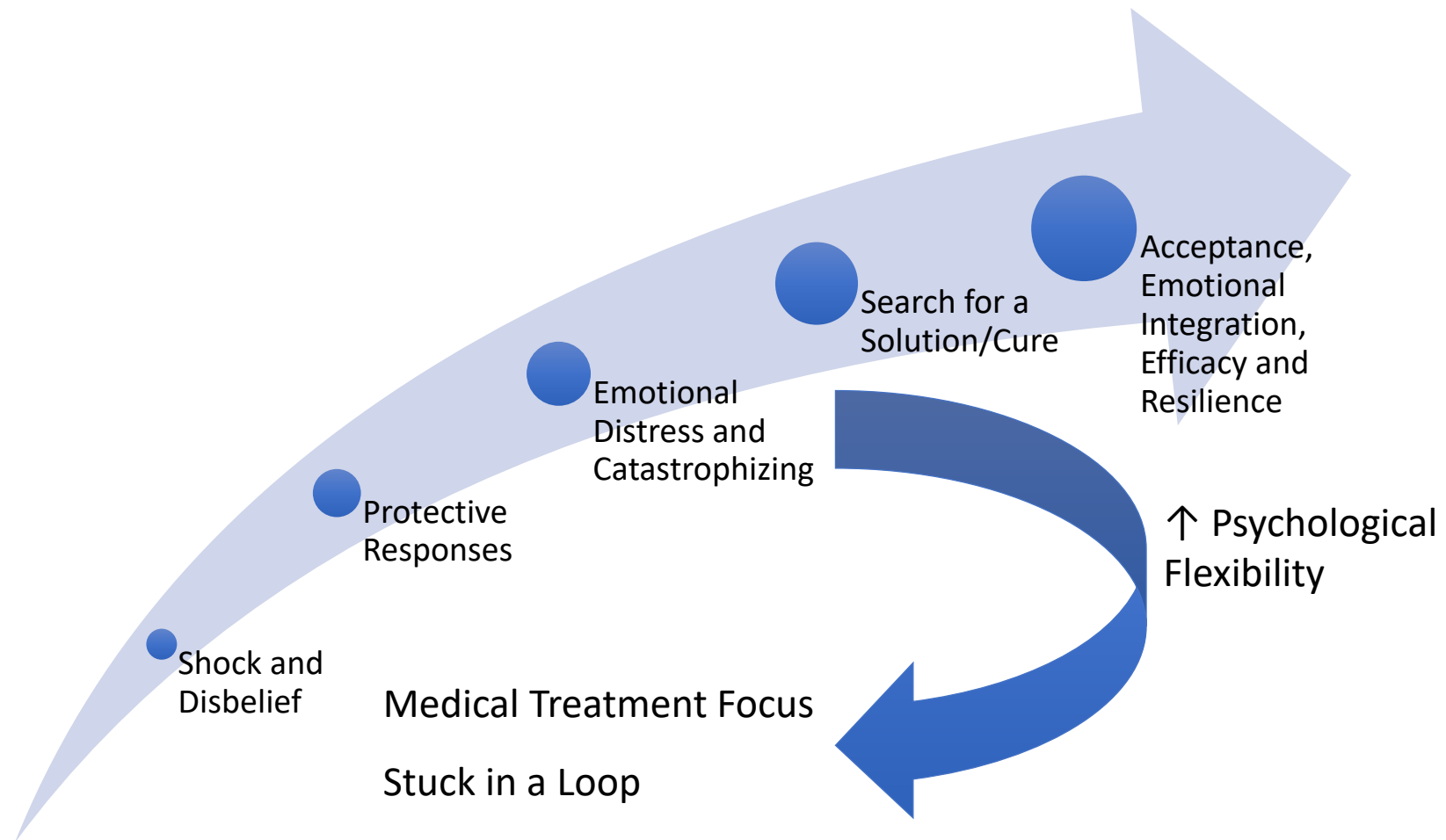
- Racial and/or ethnic minorities report more pain and have a higher prevalence of pain conditions compared with non-Hispanic white individuals.
- Hispanic Americans have the lowest level of medical insurance and more barriers to care than any other ethnic or racial group.
- Racial and ethnic minorities perceive significant discrimination in pain care.
- African Americans and individuals in the lowest wealth quartile report more pain-related disability.
- Relative to non-Hispanic whites, Hispanic Americans experience less pain interference (i.e., cultural emphasis on stoicism)
- A greater proportion of racial/ethnic minorities, specifically African Americans, have greater radiographic and symptoms of osteoarthritis.

Cuevas, O'Brien & Somnath, 2016, *Health Psychology*, 55(9), 987-995; Meints & Miller, 2016, *The Journal of Pain*, 17(6), 642-653; Hollingshead, Ashburn-Nardo, Stewart & Hirsh, 2016, *The Journal of Pain*, 17(5), 513-528; Janevic, McLaughlin, Heapy, Thacker, & Peitte, *The Journal of Pain*, 18(12), 1459-1467.

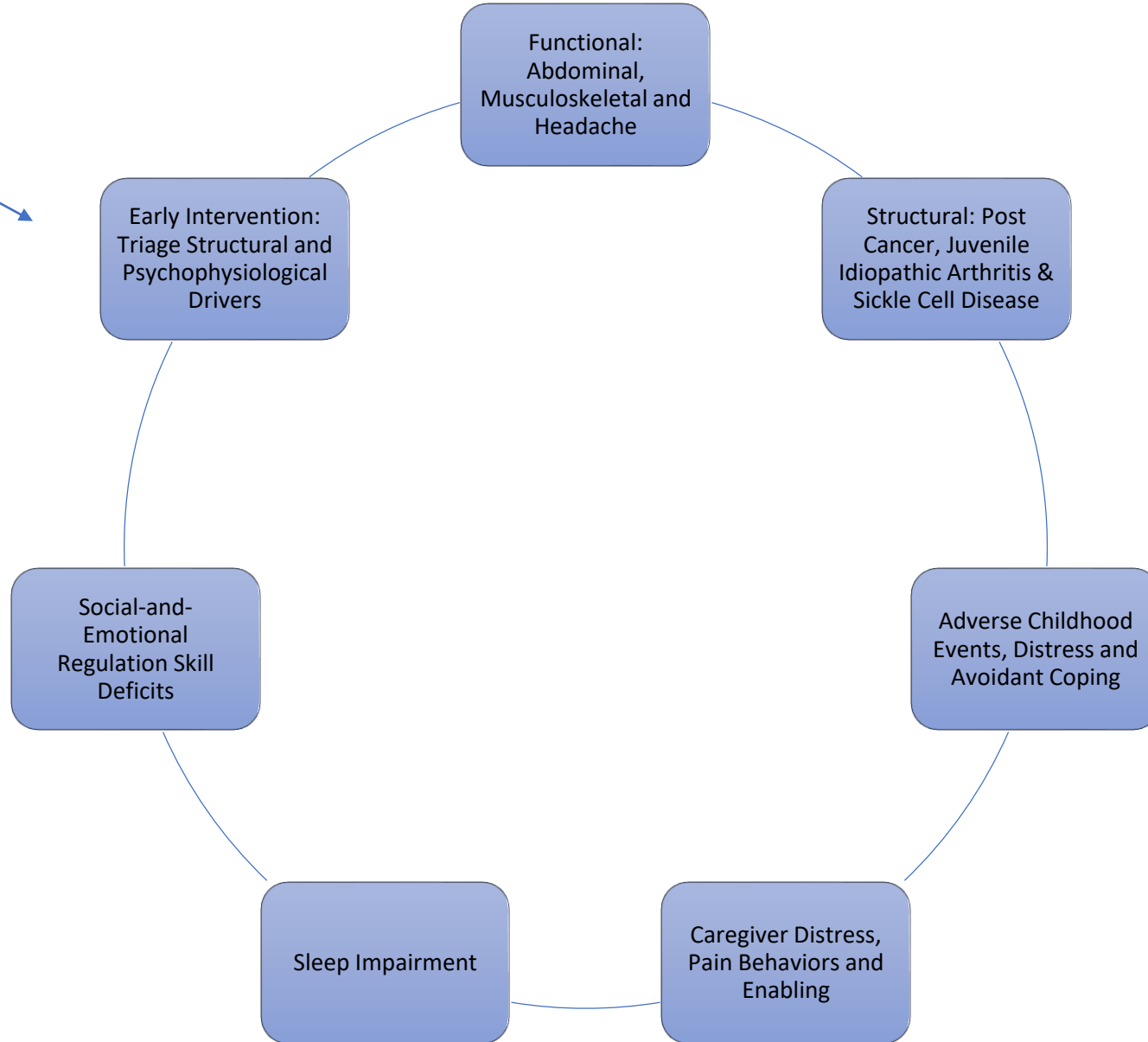
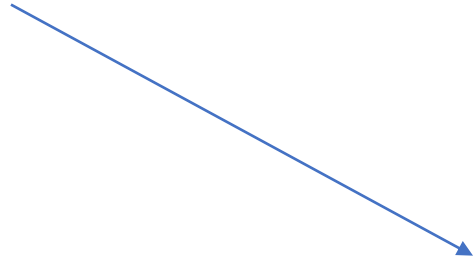
Team-Based Pain Care



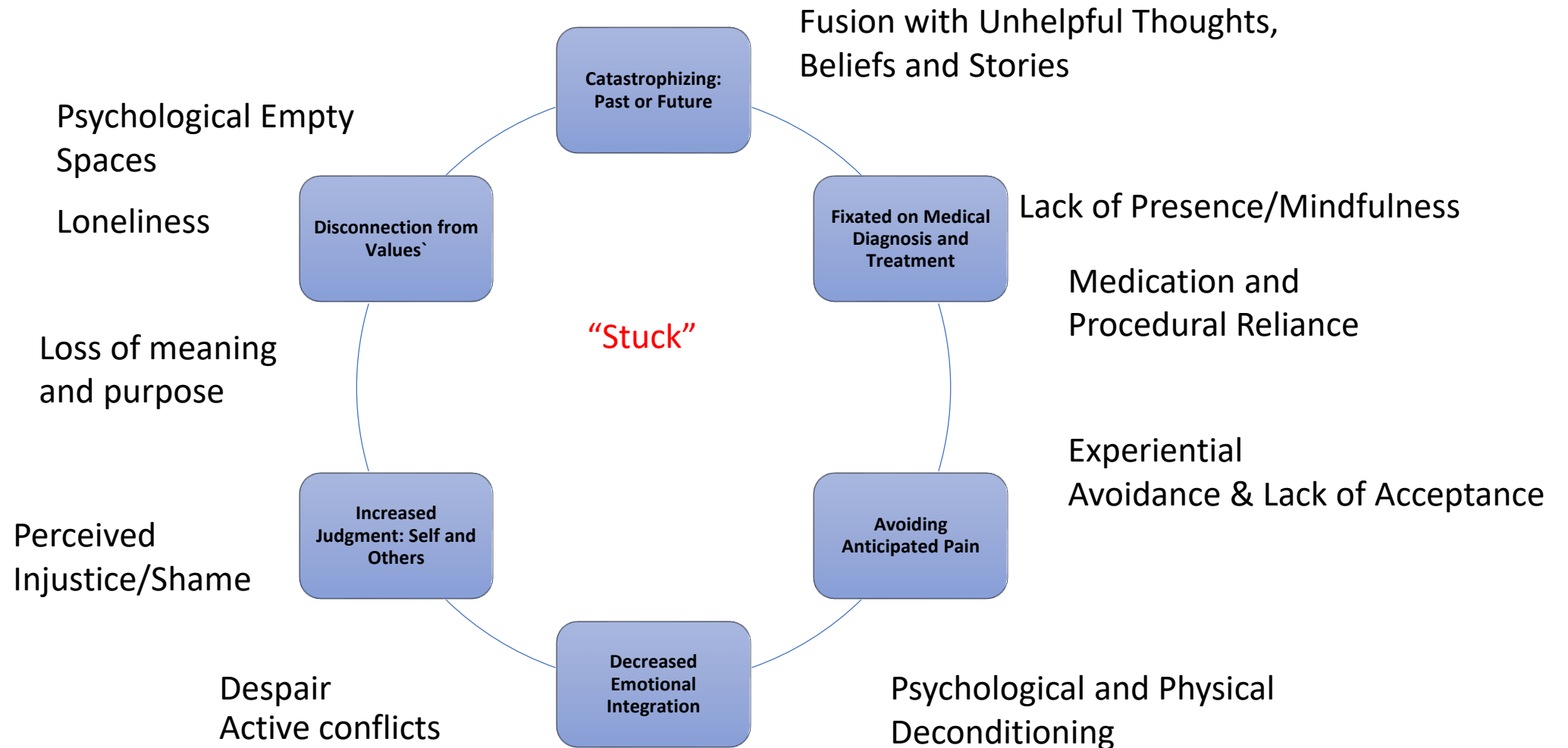
Stages of Grief and Chronic Pain



Pediatric Chronic Pain



Psychological Inflexibility: Pain Impact



High-Impact Chronic Pain (HICP)



RESEARCH
EDUCATION
TREATMENT
ADVOCACY



The Journal of Pain, Vol 20, No 2 (February), 2019: pp 146–160
Available online at www.jpain.org and www.sciencedirect.com

Original Reports

Prevalence and Profile of High-Impact Chronic Pain in the United States



Mark H. Pitcher,^{*} Michael Von Korff,[†] M. Catherine Bushnell,^{*} and Linda Porter[‡]

^{}National Center for Complementary and Integrative Health, National Institutes of Health, Bethesda, Maryland, [†]Kaiser Permanente Washington Health Research Institute, Seattle, Washington, [‡]Office of Pain Policy, National Institute of Neurological Disorders and Stroke, National Institutes of Health, Bethesda, Maryland*

High-Impact Chronic Pain

4.8 % of the US population
10.6 million individuals

Pitcher et al, 2019, Journal of Pain, 20(2), 146-160



Moderate to severe pain – Increased prevalence of widespread pain

↑ Medication Risks
↑ Distress

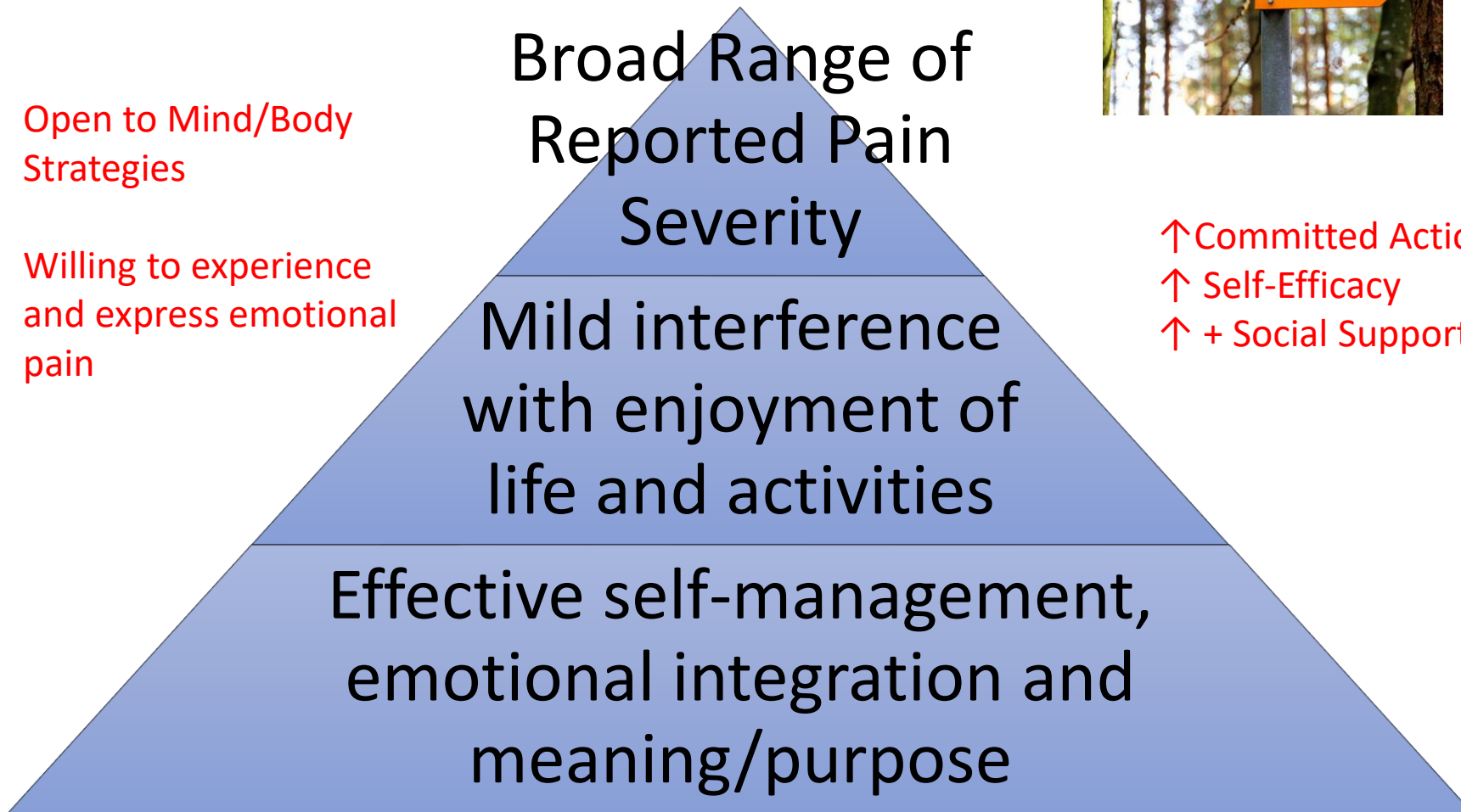
Daily impairment in one or more: work, school or training, leisure/social activity, time with friends/family, chores, transportation, important activities, and community gatherings (32% with 2-3 limitations and 22.% have more than 4 limitations)

Risk for Suicide



Younger adults
Men
HS or below education
Poverty
Hx of Anxiety/Depression

Low-Impact Chronic Pain



Key Components of Pain Evaluation

Ethnic/Racial Factors

Structural versus Functional Disorders (e.g. peripheral versus central)

Pain History

Screen for Suicidal Ideation and Risk

Purpose, Values and Goals

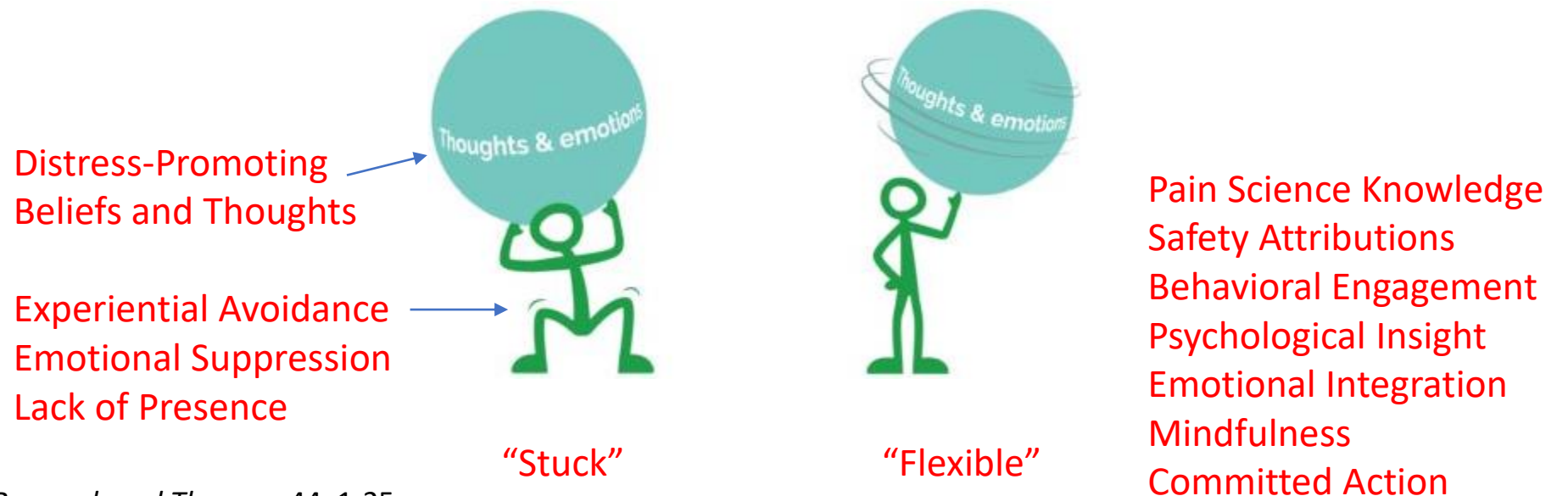


Feasibility of Care Coordination

Medical, Mental Health and Substance Use Comorbidity

Psychological Flexibility and Pain Resilience

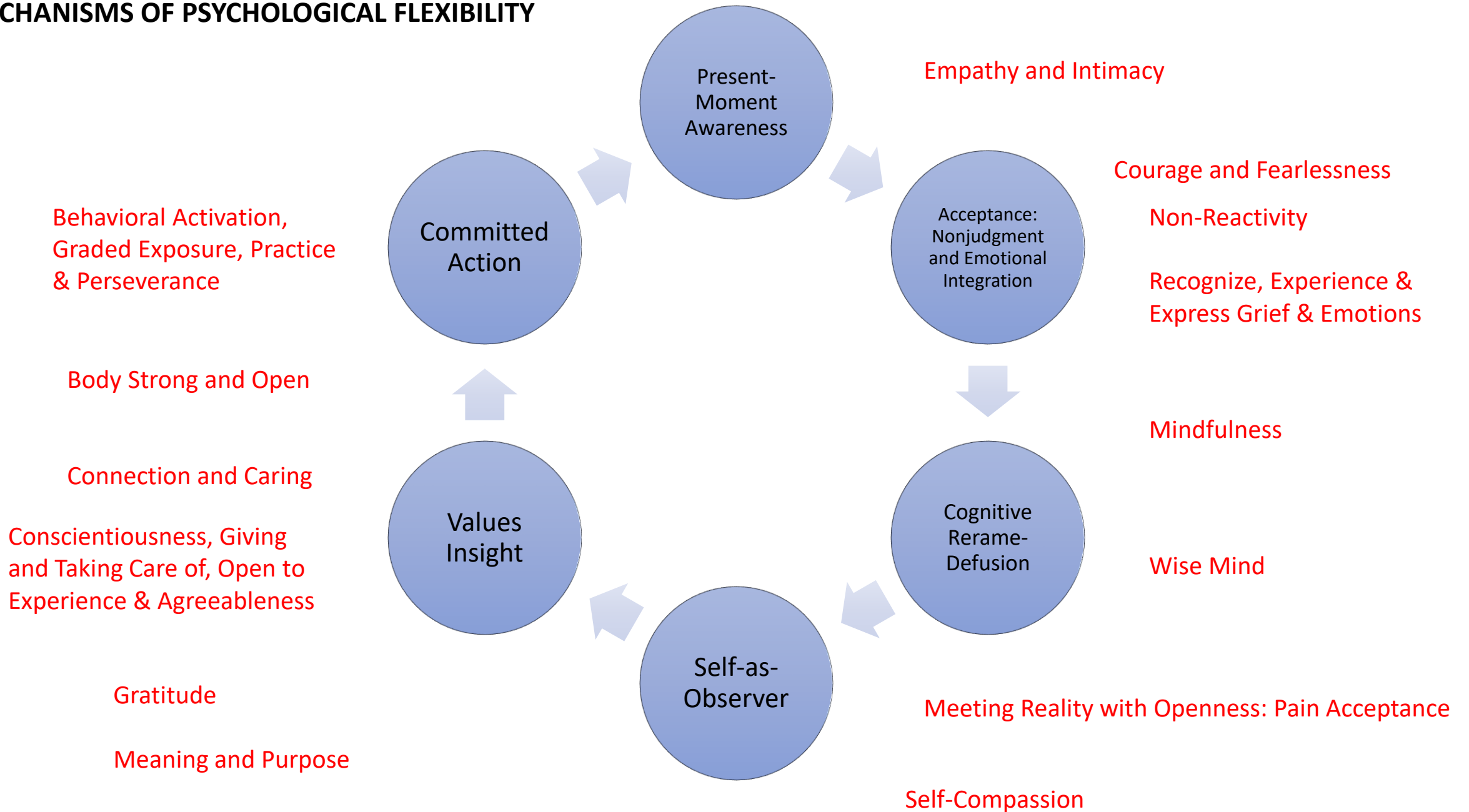
Psychological flexibility is “the ability to contact the present moment fully as a conscious human being, and to change or persist in behavior when doing so serves valued ends” (p.7).



Hayes et al, (2006), *Behavior Research and Therapy*, 44, 1-25

Lumley & Schubiner, 2019, *Psychosomatic Medicine*, 81, 114-124

MECHANISMS OF PSYCHOLOGICAL FLEXIBILITY



Neuropsychology of Psychological Flexibility

↑ Stability Regulation: PFC, Hippocampus, Insula, Striatum, PG, ACC, PCC
↓ Amygdala Activity

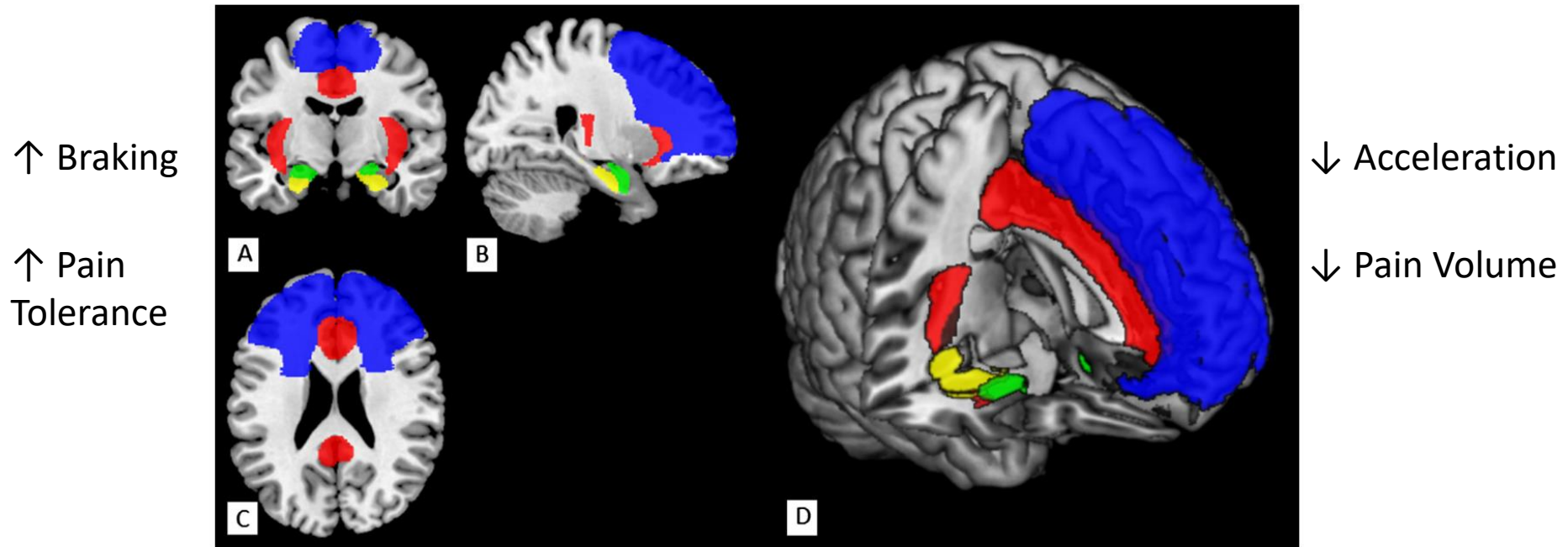


Fig. 2. Based on Hammers ROIs¹. Coronal (A), Sagittal (B), Axial (C) and 3D (D) view of gray matter areas involved in MBSR. Prefrontal cortex (blue) and Hippocampus (yellow) show increased activation, the Amygdala (green) shows decreased activation. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

Gotink et al, 2016, Brain and Cognition, 108, 32-41

↓ Inflammation

Practice Makes Permanent, Not Perfect!

Monitor for Adverse Reactions (10%)

Key factor between responders and non-responders in research



Deliberate Practice (DP)

- Attention
- Rehearsal
- Repetition



Practice strengthens circuits helpful in mindful awareness and emotional regulation.

Brabeck et al. Psychology Monitor, www.apa.org

Baer et al, (2019), Clinical Psychology Review, in press

Critical Review

Effects of Yoga Interventions on Pain and Pain-Associated Disability: A Meta-Analysis

Arndt Büssing,^{*} Thomas Ostermann,^{*} Rainer Lüdtke,[†] and Andreas Michalsen[‡]

^{*}Center for Integrative Medicine, Faculty of Medicine, University of Witten/Herdecke, Herdecke, Germany.

[†]Karl und Veronica Carstens-Stiftung, Essen, Germany.

[‡]Department of Internal and Complementary Medicine, Charité-University Medical Centre, Immanuel Hospital Berlin-Wannsee, Berlin, Germany.

Abstract: We searched databases for controlled clinical studies, and performed a meta-analysis on the effectiveness of yoga interventions on pain and associated disability. Five randomized studies reported single-blinding and had a higher methodological quality; 7 studies were randomized but not blinded and had moderate quality; and 4 nonrandomized studies had low quality. In 6 studies, yoga was used to treat patients with back pain; in 2 studies to treat rheumatoid arthritis; in 2 studies to treat patients with headache/migraine; and 6 studies enrolled individuals for other indications. All studies reported positive effects in favor of the yoga interventions. With respect to pain, a random effect meta-analysis estimated the overall treatment effect at $SMD = -.74$ (CI: $-.97; -.52$, $P < .0001$), and an overall treatment effect at $SMD = -.79$ (CI: $-1.02; -.56$, $P < .0001$) for pain-related disability. Despite some limitations, there is evidence that yoga may be useful for several pain-associated disorders. Moreover, there are hints that even short-term interventions might be effective. Nevertheless, large-scale further studies have to identify which patients may benefit from the respective interventions.

Perspective: This meta-analysis suggests that yoga is a useful supplementary approach with moderate effect sizes on pain and associated disability.

© 2012 by the American Pain Society

Key words: Yoga, pain, disability, review, meta-analysis, mind body medicine, complementary medicine.

Yoga Therapy



OPEN

Tai Chi for Chronic Pain Conditions: A Systematic Review and Meta- analysis of Randomized Controlled Trials

Received: 13 August 2015

Accepted: 14 April 2016

Published: 29 April 2016

Ling Jun Kong¹, Romy Lauche², Petra Klose³, Jiang Hui Bu¹, Xiao Cun Yang¹, Chao Qing Guo¹, Gustav Dobos^{3,*} & Ying Wu Cheng^{1,*}

Several studies reported that Tai Chi showed potential effects for chronic pain, but its role remains controversial. This review assessed the evidence regarding the effects of Tai Chi for chronic pain conditions. 18 randomized controlled trials were included in our review. The aggregated results have indicated that Tai Chi showed positive evidence on immediate relief of chronic pain from osteoarthritis (standardized mean difference [SMD], -0.54 ; 95% confidence intervals [CI], -0.77 to -0.30 ; $P < 0.05$). The valid duration of Tai Chi practice for osteoarthritis may be more than 5 weeks. And there were some beneficial evidences regarding the effects of Tai Chi on immediate relief of chronic pain from low back pain (SMD, -0.81 ; 95% CI, -1.11 to -0.52 ; $P < 0.05$) and osteoporosis (SMD, -0.83 ; 95% CI, -1.37 to -0.28 ; $P = 0.003$). Therefore, clinicians may consider Tai Chi as a viable complementary and alternative medicine for chronic pain conditions.

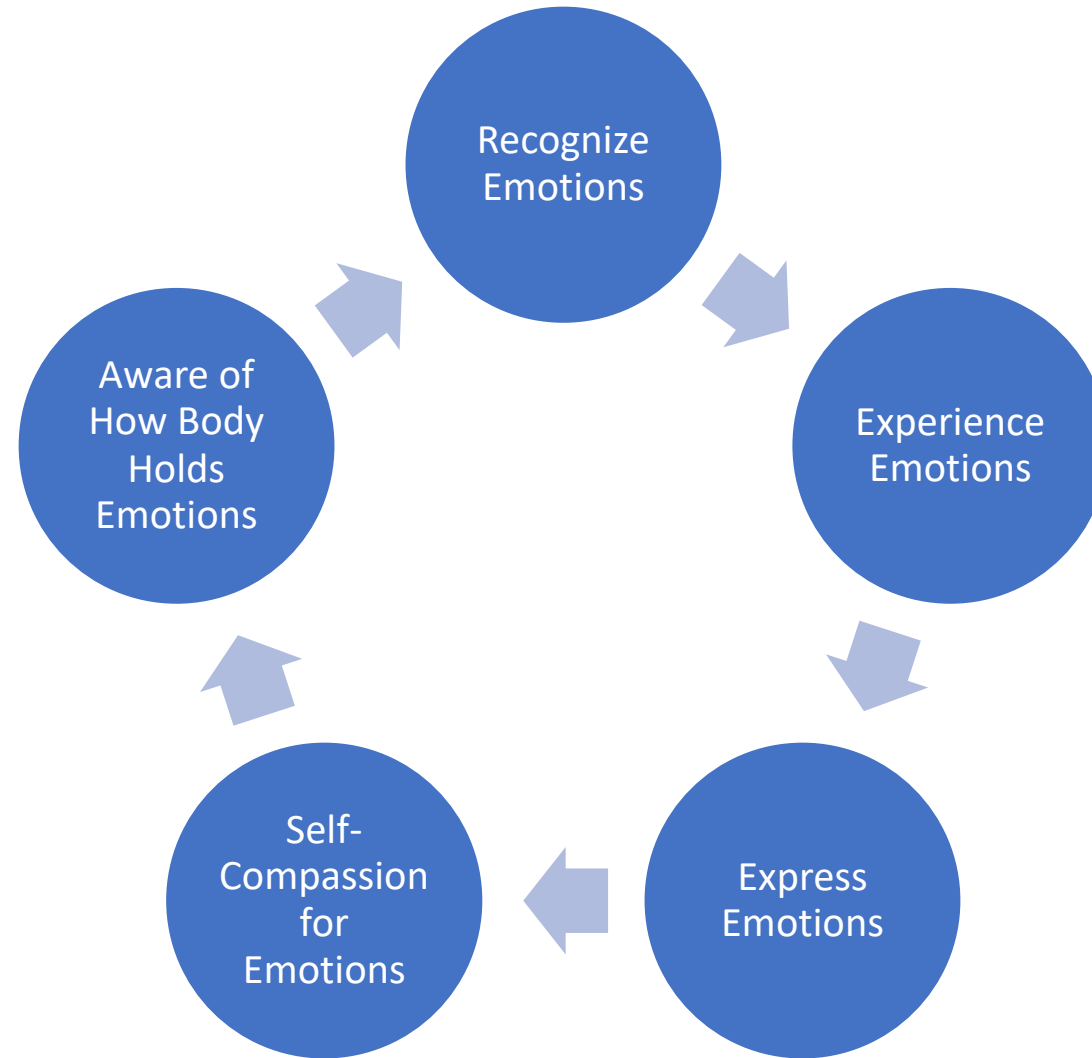
Pain Science Education

- Pain harm-alarm system
- Peripheral and central pain inputs
- All pain is real
- Plasticity of pain pathways and neurophysiological matrix
- Hurt versus harm

Results of Pain Science Education

- “I understand now that pain is a product of the brain”
- “I have learned that pain is not always a sign of damage”
- “I now realize that stress can trigger nerves that create pain”
- “My fears decrease when I move my body—I just need the courage to continue”
- “I have to find ways of lowering my inflammation”

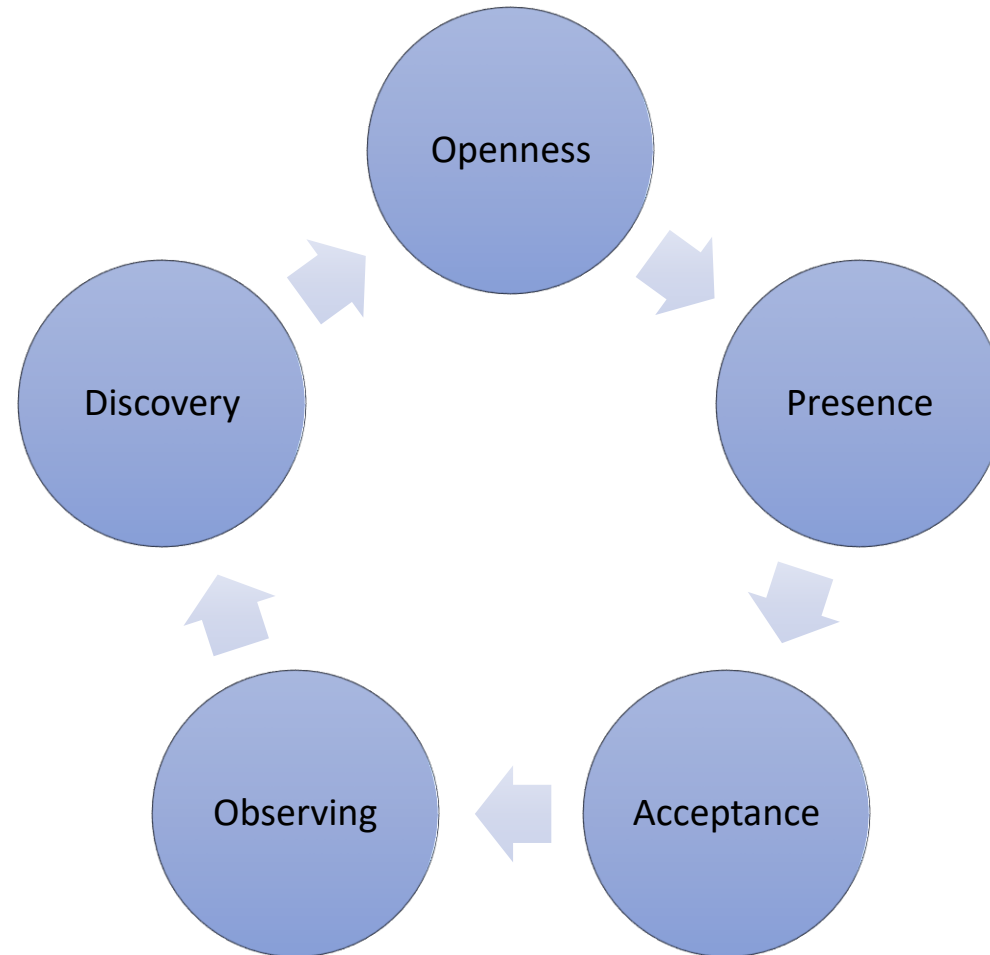
Emotional Integration



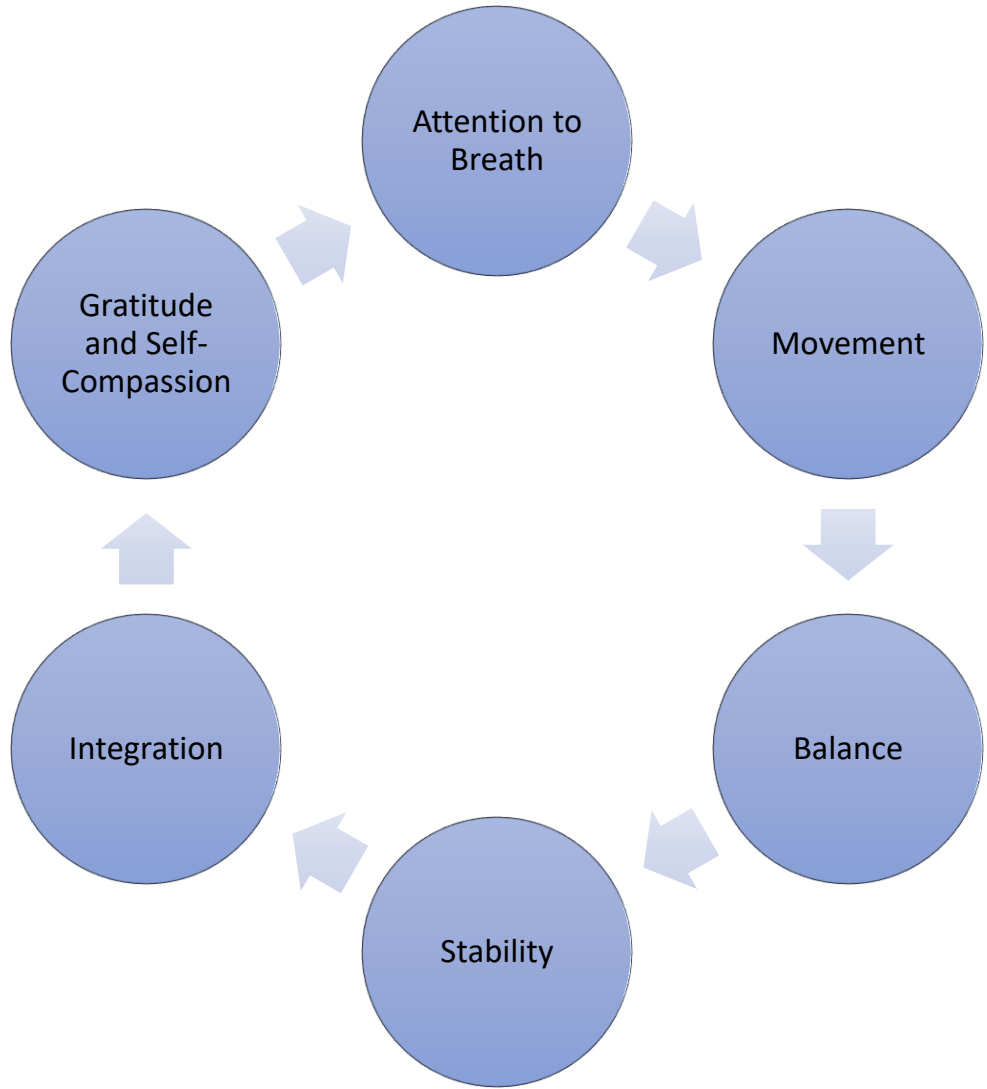
Results of Emotional Integration Strategies

- “I never realized how much my bottled-up anger was affecting my pain”
- “I have been asserting myself with my husband and I am experiencing a reduction in my headaches”
- “I now understand how much tension I was carrying in body because of my painful childhood”
- “When I feel insecure and afraid, my stomach hurts—now I see the connection”

Mindfulness Umbrella



Yoga and Tai Chi

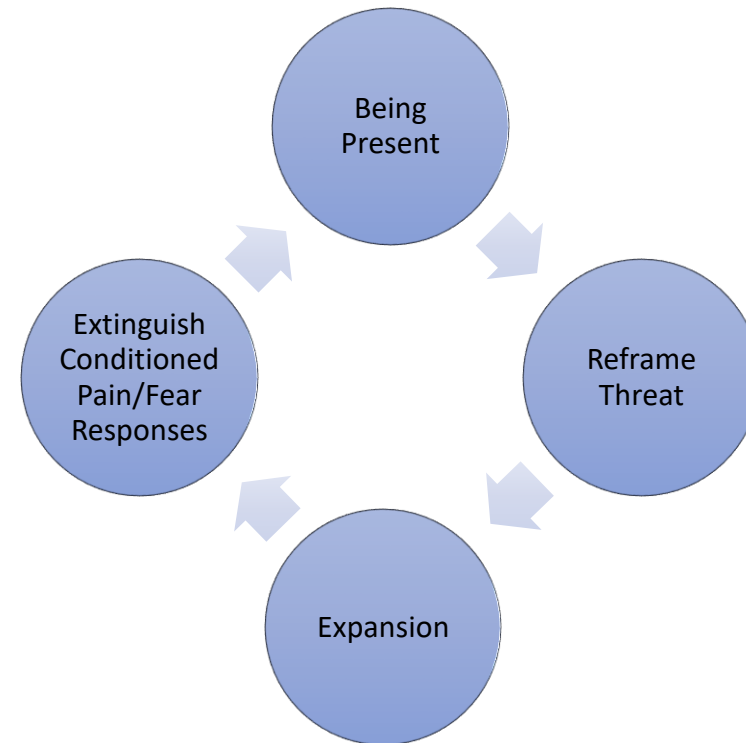


Results of Mindfulness Practice, Yoga and/or Tai Chi

- “I use my breath to center myself when I start catastrophizing about pain”
- “I can move my body by breathing, paying attention, and accepting how my body is”
- “I am growing roots and I am learning to be flexible each day”
- “I have learned how to quiet my mind and stay connected to my body and life”
- “I know that each breath is a new beginning”

Reduce Perceived Danger

- Catastrophizing
- Cognitive reappraisal and/or cognitive defusion
- Self-statements that reflect physical strength and flexibility, and safety
- Reframing pain as more benign
- Defuse pain stories



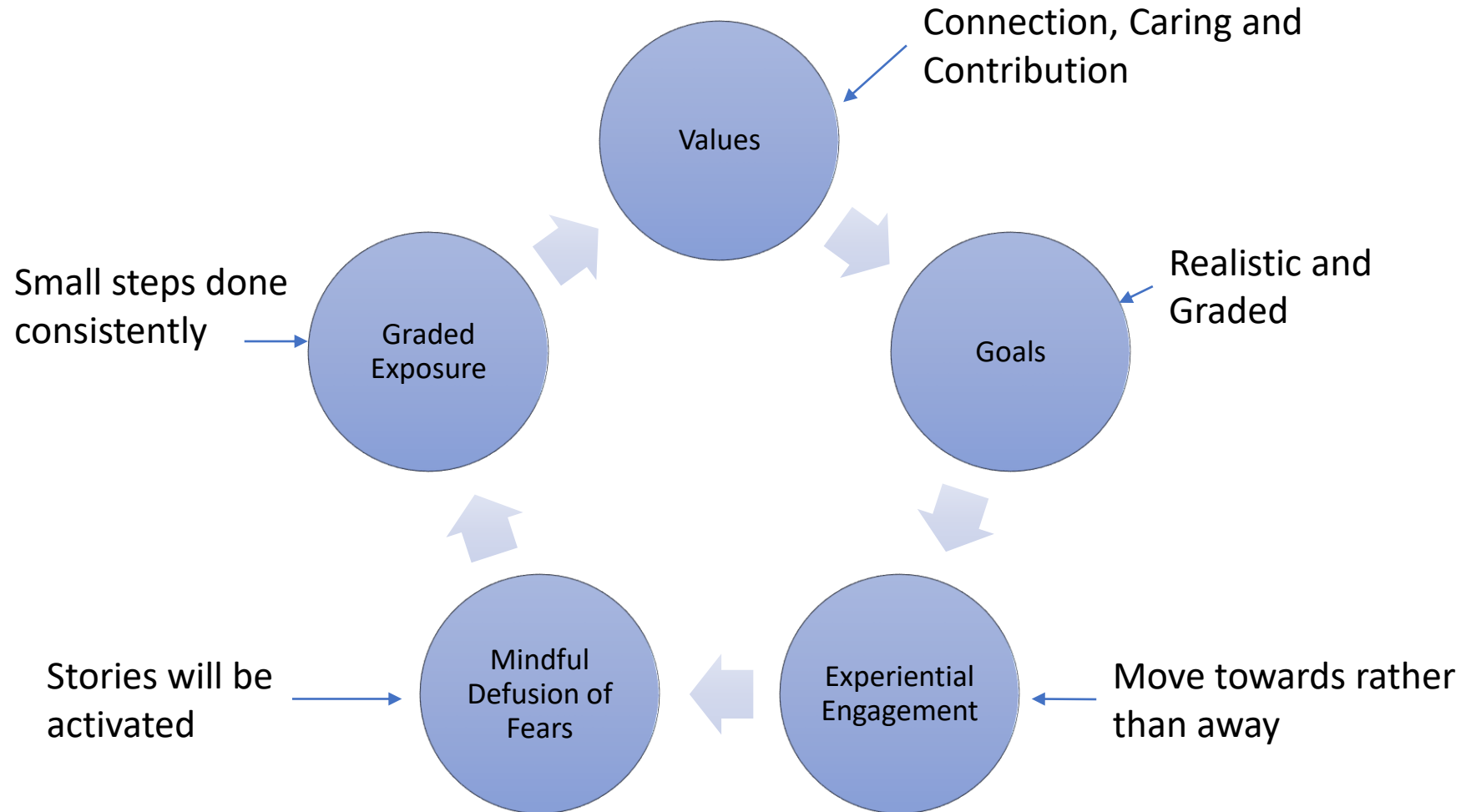
Cognitive Reappraisal

- Tracking fearful and depressive pain-related thoughts
- Identifying the triggers of these thoughts and their consequences on emotion and behavior
- Dismantling the unsupported beliefs holding these thoughts together
- Reframing the thoughts to align with evidence
- Tracking the behavior and emotional change that is the consequence of evidence-based thoughts and beliefs
- Promoting expansion in functioning and quality of life

Cognitive Defusion

- Mindful of unhelpful pain-related thoughts, beliefs and stories
- Mindful observation of their presence and understanding that we can see our thoughts, but do not have to be our thoughts
- Letting these thoughts appear and disappear
- Creating breathing room
- 10-second rule
- Self-compassion for the way our minds are!

Expansion and Committed Action



Values

Take A Stand!

What really matters? What sort of person do you want to be?
What personal strengths or qualities do you want to develop?

Gratitude = improved wellness

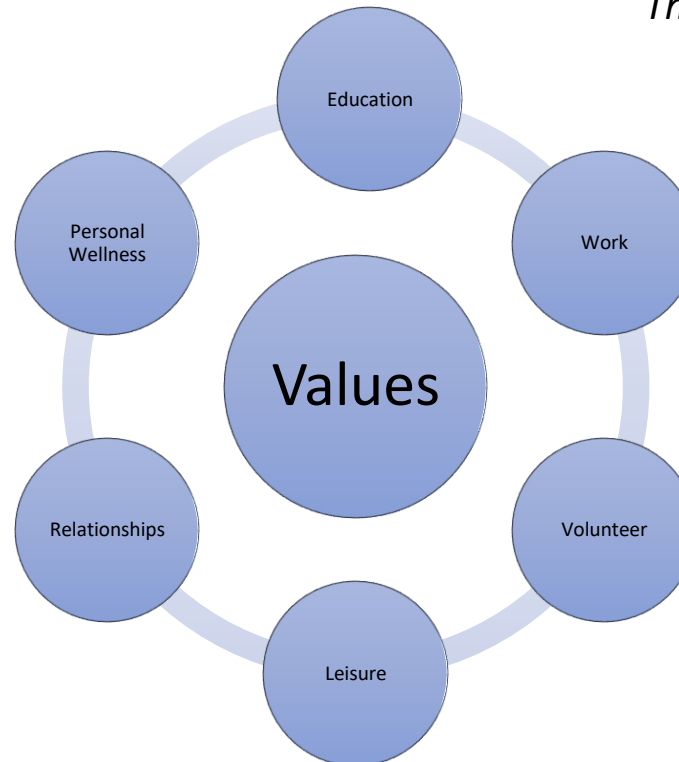
Sirois & Wood, 2017, *Health Psychology*, 36(2), 122-132

Value-Driven Behavior and Self-Efficacy

Ankawi, Stepian, Himawan, & France, 2017, *The Journal of Pain*, 18(8), 984-993

How are values and meaning in life connected?

How does one live a meaningful life if pain persists?

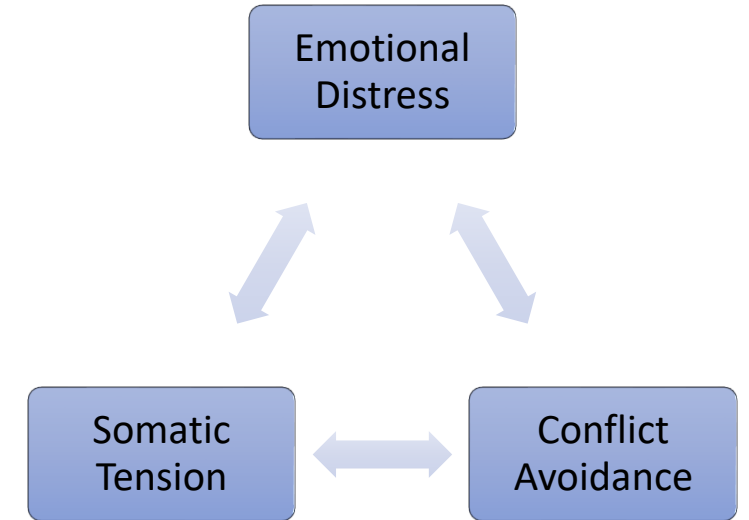


Examples of Committed Action in Individuals with Chronic Pain

- “After so many years I am now playing with my grandchildren”
- “I have been working with my trainer for 2 months now—she understands me”
- “I am really glad I started the free one-on-one yoga therapy sessions”
- “I can now walk for 30 minutes—that is great progress”
- “I feel better about myself since I started volunteering and helping others”
- “I rejoined by friends for our weekly lunch and talk”

Adaptive Interpersonal Communication

- Assertiveness training
- Meet needs for connection
- Role playing communication challenges
- Changing roles that trigger emotional pain
- Communicating through courage
- Pruning toxic relationships that become pain amplifiers



Results of Adaptive Interpersonal Communication

- “I am standing up for myself and as a result I am carrying less tension in my body”
- “I really understand now how the anger I was sitting on was making my pain worse”
- “I have been practicing mindful listening and I feel less tense and pain when talking to my husband”
- “I understand how negotiating for what I need is good for my body”

Questions?

drhillenberg@gmail.com

248.892-4364