



PRESENCE IN THE BODY: THE ROLE OF INTEROCEPTIVE AWARENESS FOR HEALTH AND WELL-BEING

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Constructs Defined



Interoception-

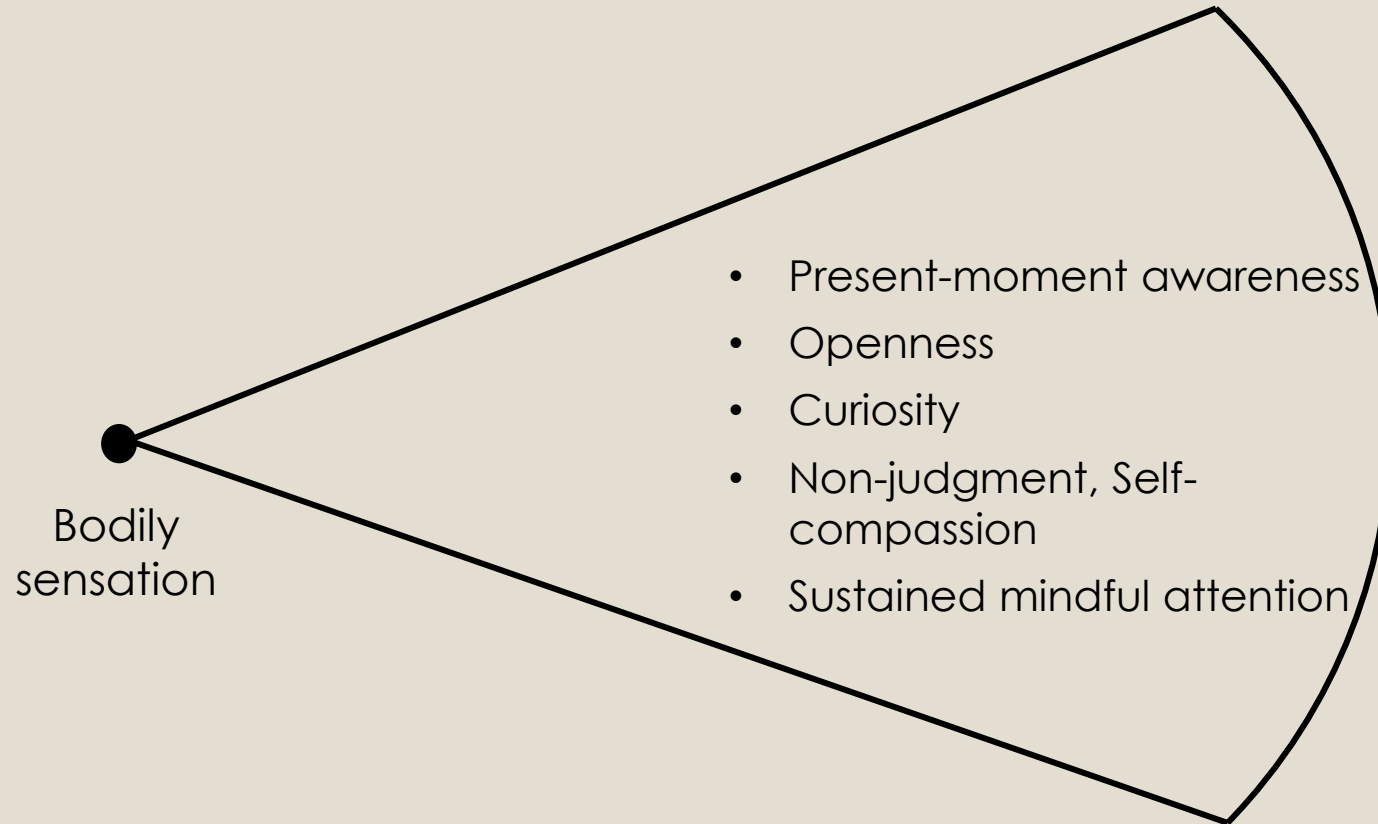
Process by which the nervous system senses, interprets, and integrates signals originating from within the body, providing a moment-by-moment mapping of the body's internal landscape across both conscious and unconscious levels¹

Interoceptive Awareness -

Understood as the '*bottom-up*' perception of bodily signals and the '*top-down*' cognitive appraisal of these signals, helping to guide responses for the regulation of homeostatic and emotional states.^{2, 3}

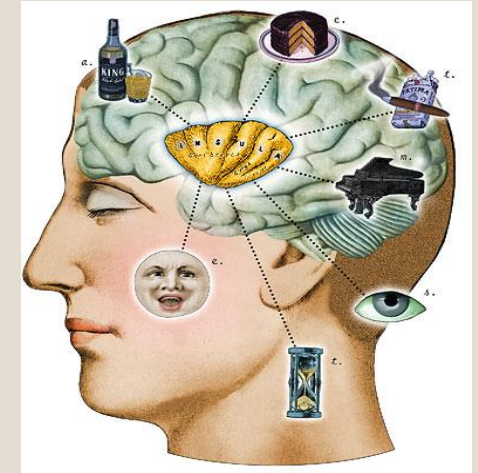
1. Craig, A. D. (2015). *How Do You Feel? An Interoceptive Moment with Your Neurobiological Self*. Princeton, NJ: Princeton University Press.
2. Khalsa, et al (2018). Interoception and Mental Health: A Roadmap. *Biol Psychiatry Cogn Neurosci Neuroimaging*
3. Schmitt & Schoen (2022). Interoception: A Multi-Sensory Foundation of Participation in Daily Life. *Front. Neurosci.*

Mindfulness Qualities/Skills Integral to Developing Interoceptive Awareness Skills

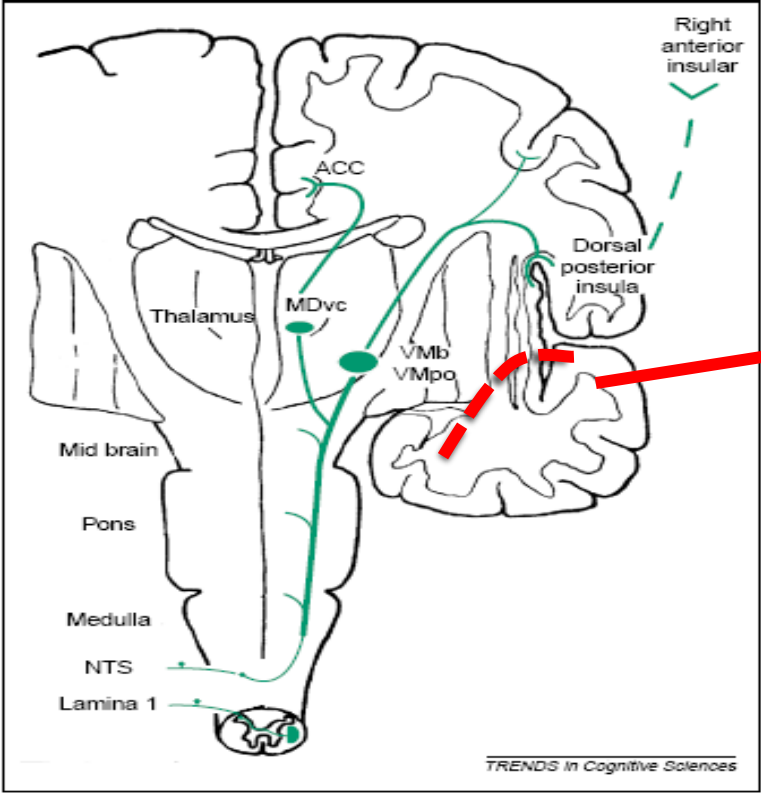


Neurocognitive Models and Research

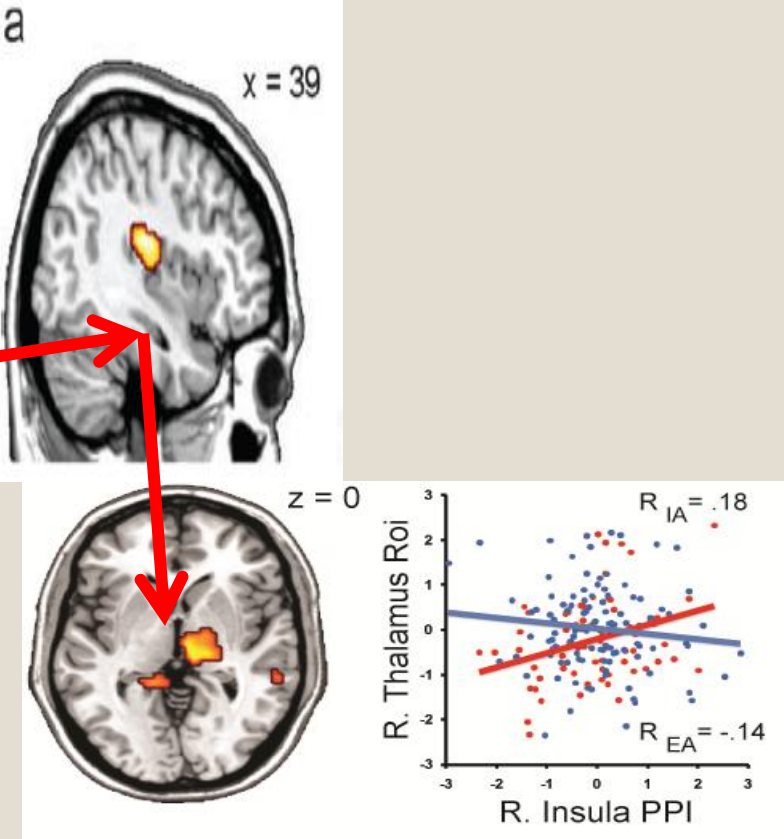
- Posterior and middle insula supports interoception and influences self-appraisal of emotion and affective symptoms. (Paulus & Stein, 2010; Seth, 2013)
- Cross-sectional studies show a lack of sensory processing in people with mental and physical health conditions compared to healthy controls. (Kerr, et al., 2016; Mallorqui-Bague et al., 2014; Tan et al., 2018; Terasawa et al., 2013; Wiebking & Northoff, 2015)
- Chronic stress appears to reduce access to interoceptive signals, which can compromise interpretation of sensations. (Noel et al., 2013; Schulz & Vogeles, 2015).
- Interoception underlies emotion regulation processes. (Damasio, 2003, Dunn et al., 2010; Farb et al 2013; Paulus and Stewart, 2014; Chen et al., 2021)



Training Activates Interoceptive Network Involving Areas of Brain Associated with Nervous System Regulation



Craig, 2005



Farb et al., Cerebral Cortex (2012)

Cancer and Interoceptive Awareness

People living with cancer tend to have difficulty attending to and processing sensory or bodily experiences. Improving interoceptive awareness is identified as a critical skill in cancer treatment and recovery to address mood, resilience and regulation.

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Advancing health psychology research in oncology: Biobehavioral models, stress pathways, and stress-management interventions for cancer patients

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Relevance to MT with Head and Neck Cancer Patients

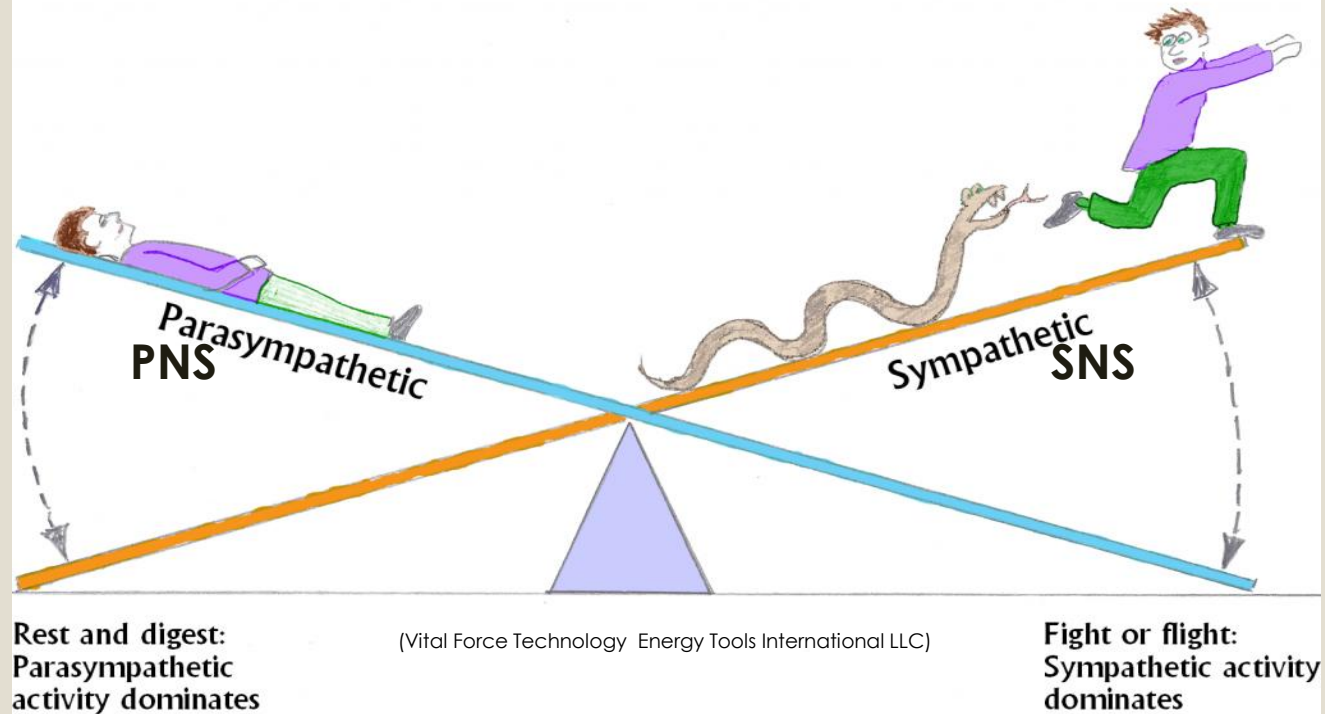
- More is needed to help cancer patients address their symptoms of physical and emotional distress.
- Examples:
 - The physical discomfort of radiation
 - The emotional and physical discomfort related to changes in facial features
 - Changes in ways we express intimacy – numbness in lips and inability to kiss
 - Eating and social situations if drooling and having other challenges when eating with others
 - Depression – suicide rate is high due to the long term sequelae of symptoms for patients post treatment

What do Clients Get from Improved Interoceptive Awareness?

- Develops awareness of inner sensory experience
- Helps link awareness of link between physical and emotional symptoms
- Facilitates acceptance and self-compassion
- Promotes somatic reappraisal – new understandings of self
- New tools for self-care – empowering – helps with regulation and sense of agency (distress management)
- Promotes behavior changes – new ways of being
- Client learns to experience body as a resource for understanding self and engaging in self-care/regulation

Our goal with clients is often to help them better regulate and including interoceptive skills is a key element for improving emotion regulation

Homeostasis is a dynamic balance between the autonomic branches.



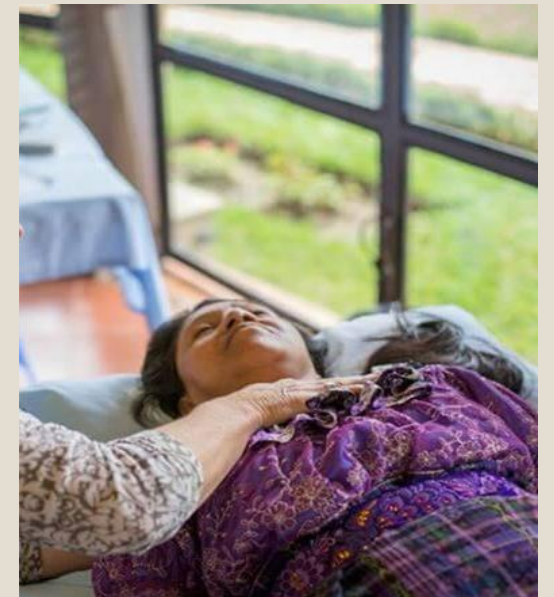
Mindful Awareness in Body-oriented Therapy

- ▶ Teaches interoceptive awareness skills
 - ▶ Includes touch, psychoeducation, mindfulness

Explanatory Model:



- Delivered individually
- Incremental in approach
- Evidenced-based
- Trauma-informed
- Involves home-based practice



Price, C. & Hooven, C. (2018) Interoceptive Awareness Skills for Emotion Regulation: Theory and Approach of Mindful Awareness in Body-oriented Therapy (MABT). *Frontiers in Psychology*



Aspects of Learning Interoceptive Awareness through MABT

- Aware/Identify sensations
- Access inner body
- Sustained Attention to Inner body
- Evaluation/Meaning (Somatic Re-Appraisal)
- Take Home Practice

MABT Research Protocol and Key Training Processes

Intake: Check in/Conceptual Framing/Trust Building

Three Stages for Sequential Learning to Promote Interoceptive Awareness:

- Sessions 1 & 2: Body Literacy → Awareness
- Sessions 3 & 4: Interoceptive Awareness Exercises → Access
- Sessions 5 - 8: Mindful Body Awareness Practice → Sustained Attention

Session Review: Somatic Reappraisal and Take Home Practice

Experiential: MABT Learning Strategies



Selected MABT Study Publications:

<https://www.cmbaware.org/publications/>

- **Women in Recovery from Child Sexual Abuse**

- Price, 2004 *J. of Complementary and Alternative Medicine*
- Price, 2005 *J. of Body and Movement Therapies*

- **People Living with HIV**

- Price, Taibi and Voss, 2012 *J. Assoc. Nurses in AIDS Care*

- **Interoceptive Awareness Learning Processes**

- Price, Krycka, Breitenbucher, et al., 2012 *Indo-Pacific J. of Phenomenology*

- **Substance Use Disorder (Adjunct to Treatment)**

- Price, Wells, Donovan et al, 2012 *J. of Substance Abuse Treatment*
- Price, Thompson, Crowell, et al., 2019 *Drug and Alcohol Dependence*
- Price, Treadway, Kristofferson, Pike, Merrill, 2024 *Mindfulness*
- Price, Pike, Merrill, 2025 *Drug and Alcohol Dependence*

- **MABT for Chronic Pain**

- Price et al., 2007 Female Veterans with comorbid PTSD and Chronic Pain: *JACM*
- Price, Colgan, Blakeney, Hansen, 2024 *Global Advances*
- Hansen et al., 2024 Implementation Science Study *Global Advances*

- **Neuroimaging**

- Price, Sevinc & Farb, 2023 *J. of Brain Sciences*
- Zuo, Farb, Price, 2023 *European J. of Neuroscience*

Key Health Outcomes Across Studies

- Increases in interoceptive awareness and mindfulness
- Reductions in mental health distress
- Reductions in emotion dysregulation and improved HRV
- Reductions in substance use and craving
- Reductions in physical symptoms and pain
- Continued use of skills learned (multiple times/week) across study periods (9 and 12 follow-up)

Measuring Interoceptive Awareness: Scale of Body Connection¹ and MAIA Scale²

MAIA SCALES

1. **Noticing:** Awareness of uncomfortable, comfortable, and neutral sensations
2. **Attention Regulation:** Ability to sustain and control attention to body sensations
3. **Emotional Awareness:** Awareness of the connection between body sensations and emotional states
4. **Self-Regulation:** Ability to regulate distress by attention to body sensations
5. **Not Distracting:** Tendency not to ignore/distract from pain/ discomfort
6. **Not Worrying:** Tendency not to worry or experience emotional distress with sensations of pain or discomfort
7. **Body Listening:** Active listening to the body for insight
8. **Body Trusting:** Experience of one's body as safe and trustworthy

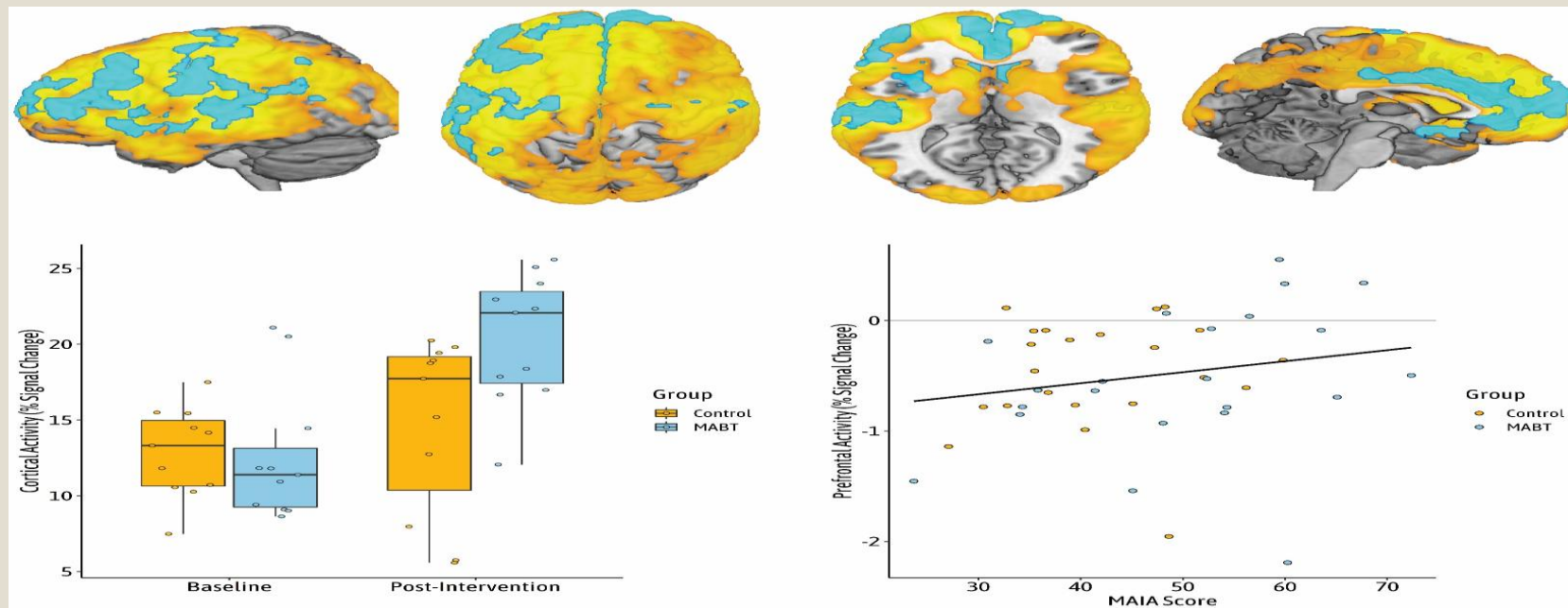
1. Price & Thompson (2007). Measuring Dimensions of Body Connection: Body Awareness and Bodily Dissociation. *J of Alternative and Complementary Medicine*.

2. Mehling, W., Price, C., Daubenmier, J., Acree, M., Bartmess, E., Stewart, A. (2012). The Multidimensional Assessment of Interoceptive Awareness (MAIA). *PLoS One*, 7(11):e48230.

MABT Training Increased Brain Connectivity

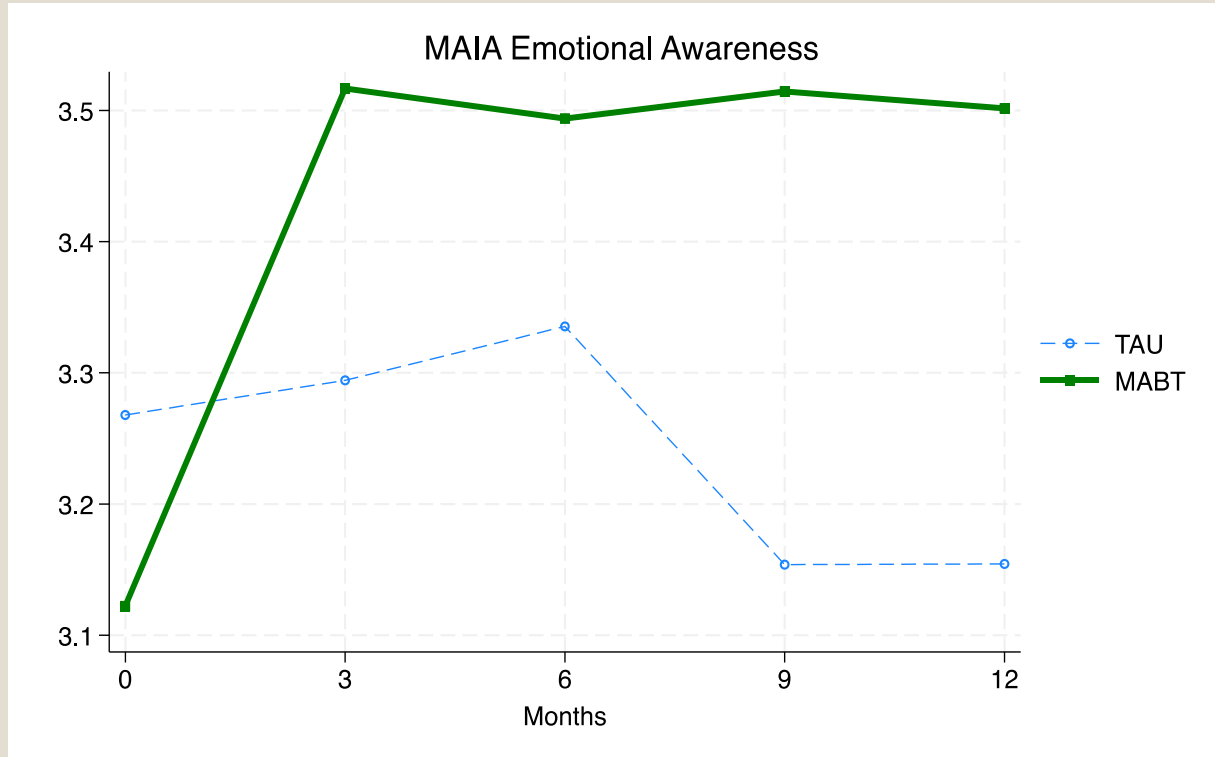
Results highlight training-related plasticity in interoceptive networks. The connectivity changes were associated with increased MAIA scores suggesting that insula–prefrontal connectivity mediates greater subjective access to interoceptive information.

Price, Sevinc, Farb 2023 Brain Sci



$\beta = .33$, 95 CI [.14, .52], $p < .001$

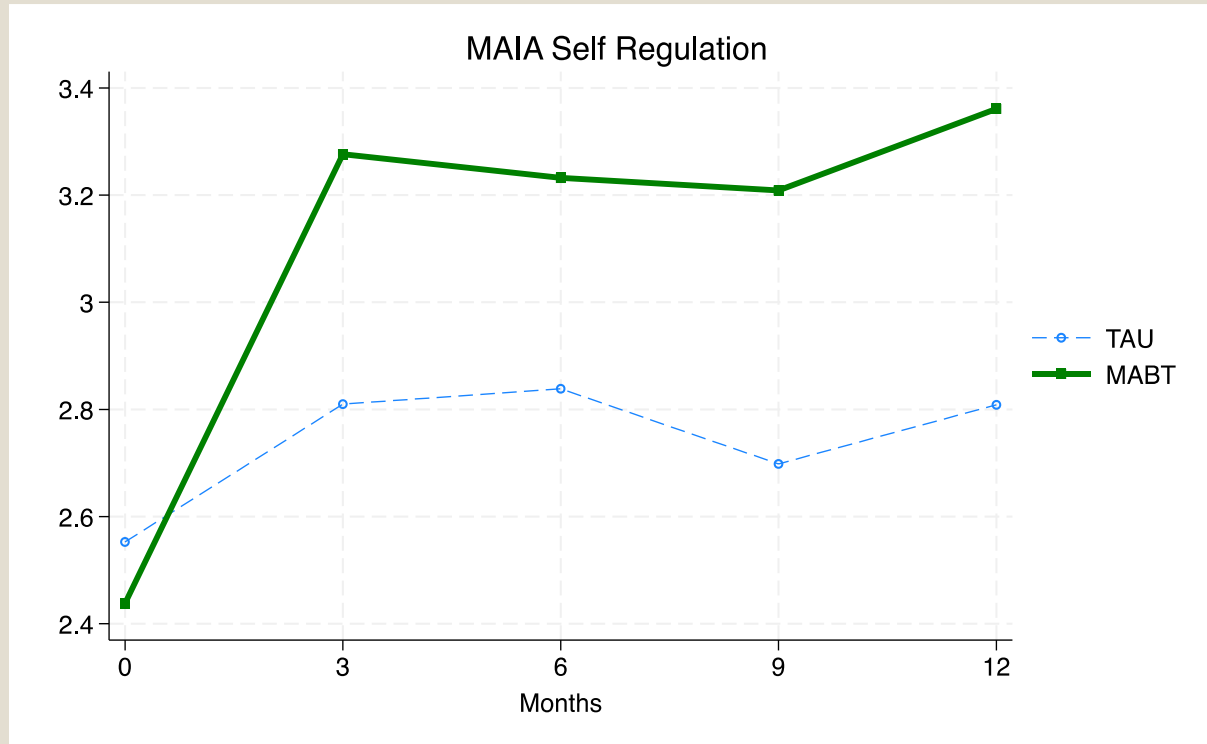
MAIA Emotional Awareness Across 12 Months



1. I notice how my body changes when I am angry
2. When something is wrong in my life I can feel it in my body
3. I notice that my body feels different after a peaceful experience
4. I notice that my breathing becomes free and easy when I feel comfortable
5. I notice how my body changes when I feel happy/joy

- Group X Time: $p = .003$
- 0-12 months: MABT vs TAU, .49 (.20, .78) 95% CI, $p = .001$

MAIA Self Regulation Across 12 Months



1. When I feel overwhelmed I can find a calm place inside
2. When I bring awareness to my body I feel a sense of calm
3. I can use my breath to reduce tension
4. When I am caught up in thoughts, I can calm my mind by focusing on my body/breathing.

- Group X Time: $p < .001$
- 0-12 months: MABT vs TAU, .67 (.39, .95) 95% CI, $p < .001$

I tried meditating over the years and I was never able to concentrate. With MABT, I was able to slow my mind down and then follow what she (the therapist) was saying, concentrating on a body part, and what I was feeling and afterwards talking about that. Eventually, I learned to do that by myself. This is why I thought this was amazing because it taught me to meditate. Now I meditate every night. The difference is having someone lead me into learning how to do it first.

Price & Smith-DiJulio, 2016 J. of Addiction Nursing

What People Learn in MABT

Primary Themes from Qualitative Data

- **Increased Awareness of Bodily Self**

- *Had tuned-out of my body; now I check in with whole body*
- *More in tune with different parts of my body, can tell where I experience sensations*

- **Link Emotions and Sensations**

- *Connections between cravings and where they exist in the body*
- *Learning to connect mind, body, spirit*

- **Regulatory Skills**

- *Learned how to relax and calm myself; to put myself in a place that is peaceful*
- *I can use emotions vs. have them use me*
- *Gave me coping skills when I'm in a stressful situation*

- **Acceptance**

- *Learned to listen to my body, not fix it*
- *Learned to just let them be (my feelings)*
- *Honor emotions even if they are negative*

Female, 45, White American: You're not hiding from things inside you anymore... I think that had pretty much a lot to do with my use. I was trying to cover up feelings, trying to cover up emotions – it was how I coped with life. It {MABT} gives me the ability focus on things in a different way, you know? It's a very unique way to think about things that are within me and connect my body to my mind and my spiritual duality and being {able} to connect everything inside.

Male, 68, Black American: I learned to relax the whole me. When I am relaxed I am more at ease and ready for what is next. once I am relaxed I feel like I want to do something like get on my bike and walk. It makes you more aware. I never really was in touch with my emotions before and she {the therapist} showed me different ways to recognize and manage them. I am more aware of what I am doing. It makes me stop and think do I really want to smoke right now? do I really want to drink right now? Now I'm able to sit or lay down and use MABT practices to respond to pain and discomfort instead of using medication.

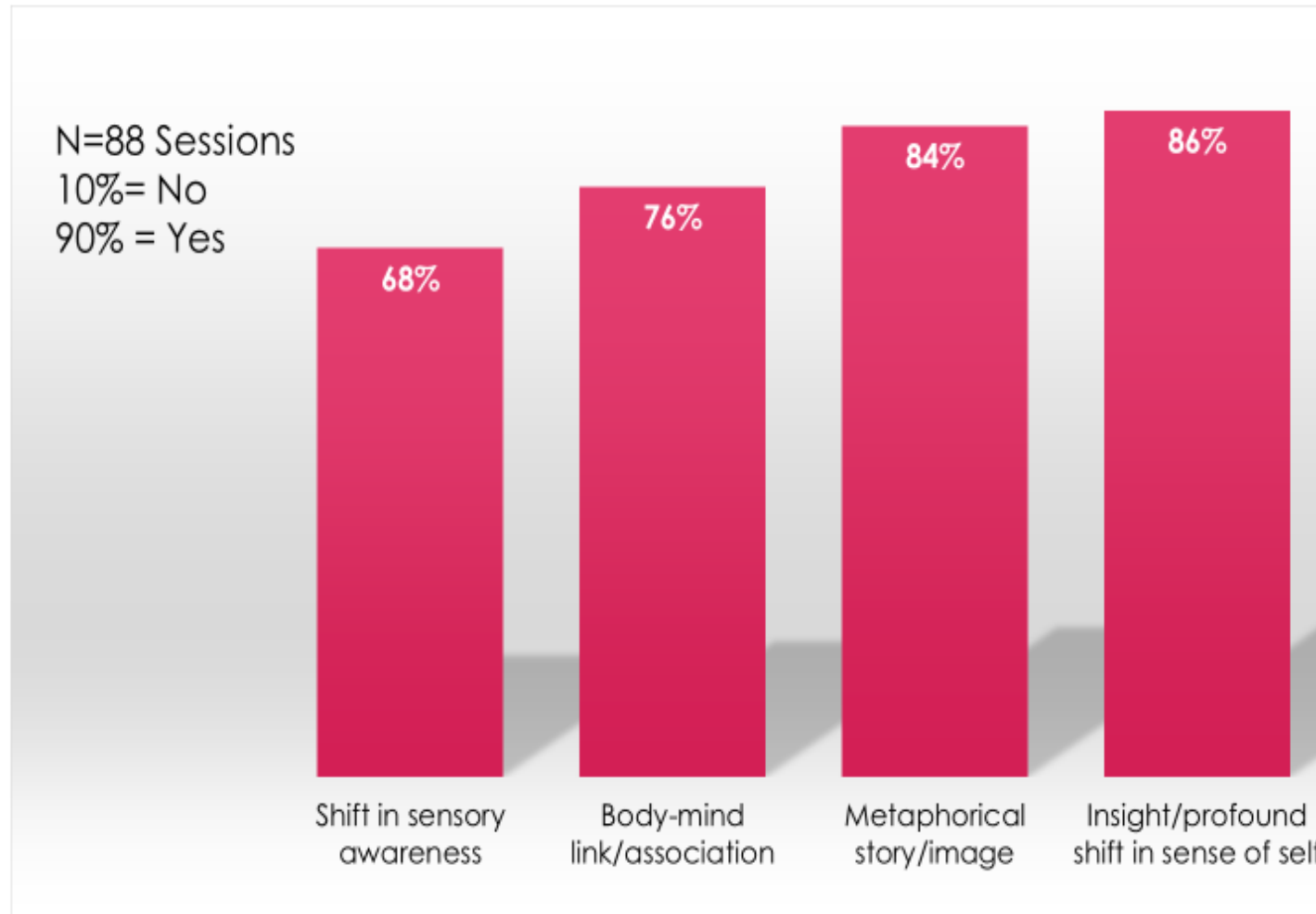
Female, 31, Native American: i learned to listen to my body and really feel my emotions and was able to recognize how they were related. i came in with a horrible back problem which caused headaches and a lot of discomfort and now i have none of it. it was all from tension due to stress. I can sit and feel my emotions and sit with them and not have them control me as well as find and release negative energy in my body. i used to lash out or stay in bed on bad days i didnt want to face. now i can talk myself through them. i feel so much happier and truly feel i can say i love myself now.

Therapist Data

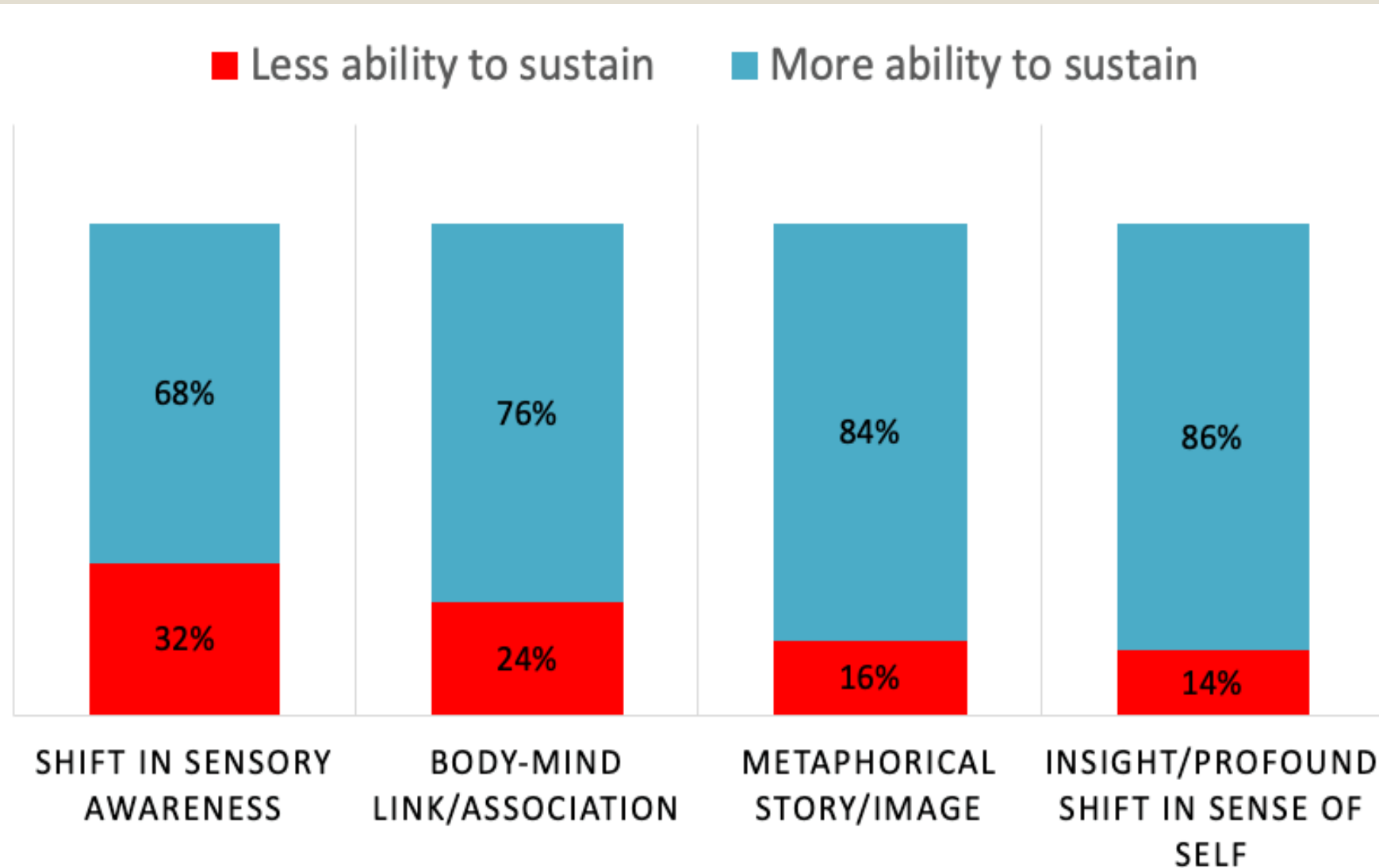
- Second half of intervention when sustained mindful attention is taught
- Therapists asked to record participant experiences that involved re-appraisal processes, and how engaged the client was able to be.



Stage 3 –Therapist Ratings Somatic Reappraisal



Relationship Somatic Reappraisal and Capacity for Sustained Attention



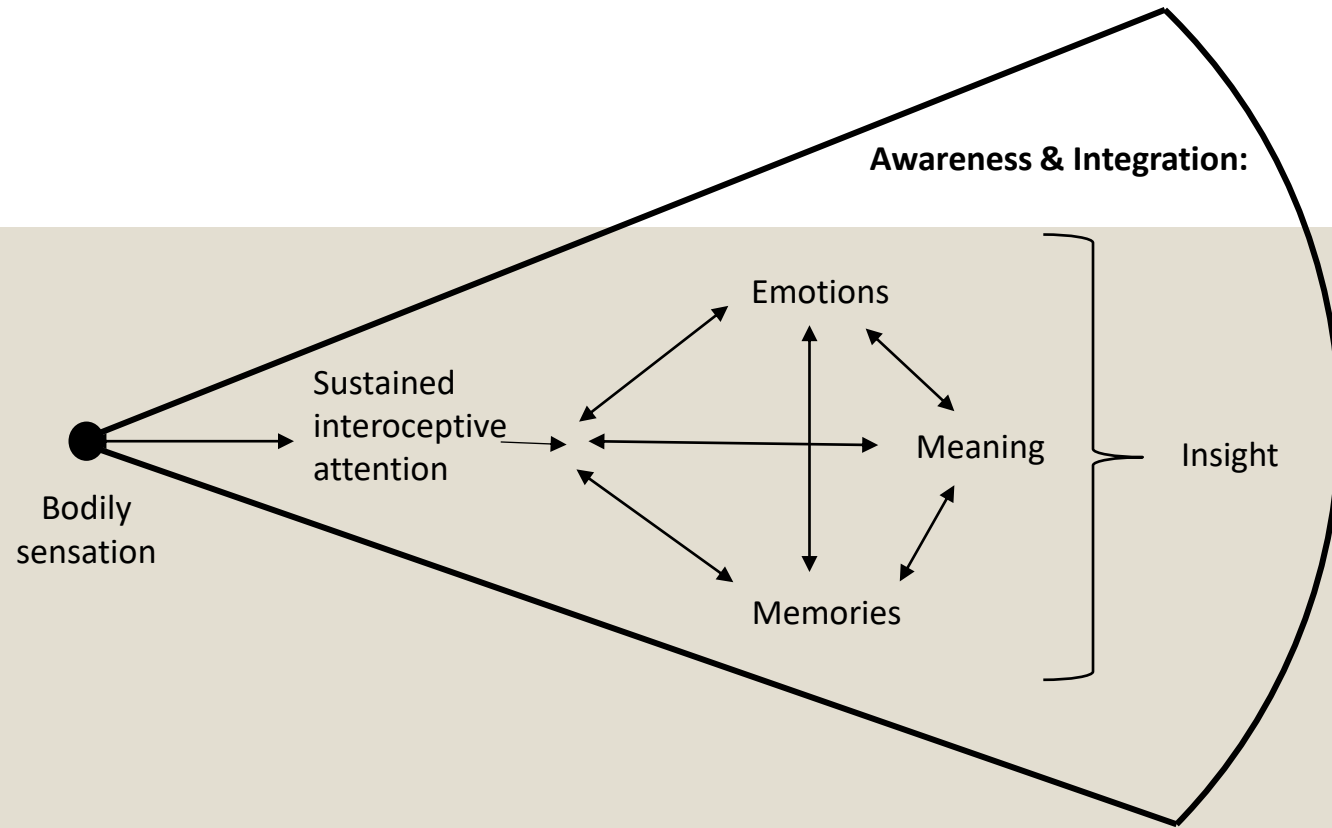


Figure from Price, C. & Weng, H. (2021). Facilitating Adaptive Emotion Processing and Somatic Reappraisal via Sustained Mindful Interoceptive Attention. *Frontiers in Psychology*.

Why Does Interoceptive Awareness Matter?



Self-Awareness: Access and Trust Body Cues

Emotion Regulation

Manage Daily Stressors/ Health Conditions

Supports Healthy Choices

Supports Self-Agency/Behavior Change

Relevance to MT with Head and Neck Cancer Patients

- Examples:

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What Supports Teaching Interoceptive Skills to your Clients?

- ▶ Therapist/Provider Self-Presence and Capacity for interoceptive engagement
- ▶ Comfort and Skill in teaching mindful interoceptive attention
- ▶ Trust and Sense of Safety in the Therapeutic Relationship
- ▶ Individualization of Learning Strategies
- ▶ Follow Client/Unfolding Process

Therapist/Practitioner Use of Interoceptive Skills for Their Own Self-Care



Manage Daily Stressors

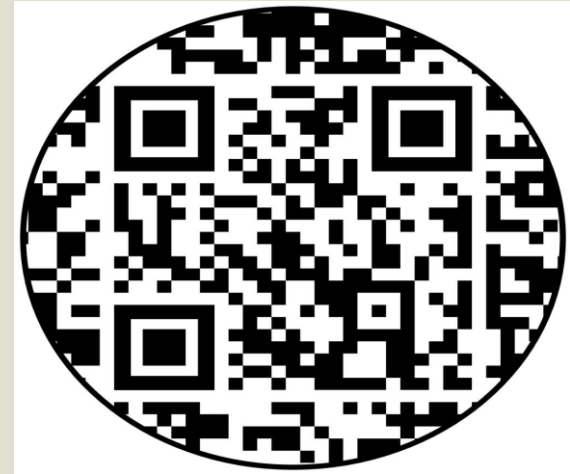
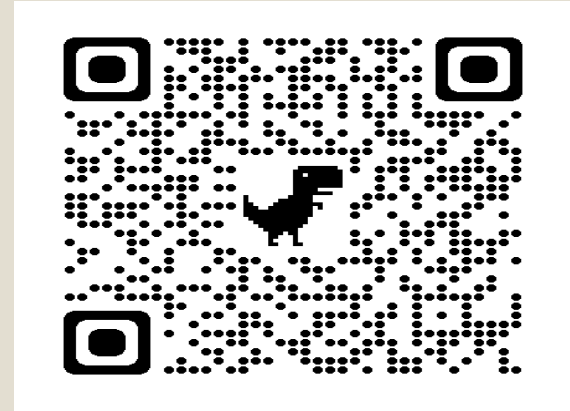
Emotional Balance/Wellness

Increased Presence in work with clients

Prevent Burnout

In Summary

- Helping our clients learn more skills for attending to their internal bodily can facilitate self-awareness, symptom management, and emotion regulation.
- Helpful for all, but highly relevant to cancer care, your clients may also be better able to integrate and extend into daily life any experiences of inner peace as well as ways they can promote feelings of calm, acceptance, and joy into their lives.



If you'd like to receive email with quarterly newsletter from the [Center for Mindful Body Awareness](#) to learn about trainings and MABT research/news. Scan the top QR code to get to the newsletter sign up; the lower QR code to see upcoming trainings.