As expounded on in the previous article on Centralized Pain, we discussed how prolonged pain system activation can lead to hyper-responsiveness and lowered thresholds so nerves fire more easily, a dual phenomenon called wind-up and sensitization. Sensitization is when pain loses its protective properties and becomes maladaptive and pathological; but the protective purpose of pain is to prevent harm and tissue damage and it does that by engaging the withdrawal reflexes to avoid further injury. If a person's pain causes them to believe they will be harmed, they are likely to avoid painful activities in an effort to prevent damage. In nociplastic pain, which does not of its own accord have tissue damage involved, this reflexive behavior can lead to worsened outcomes, and it is important to learn the difference between hurt and harm and which behavior is promoting what in the case of nociplastic pain.

In Sensitization, Centralized Pain, and CRPS, a recommended treatment modality that was stated would receive its own companion piece was desensitization techniques—more commonly known as exposure-based therapies in the medical domain. Whether called desensitization, graded exposure, graded activity, or use-it-or-lose-it, exposure-based therapies have strong evidence and some of the strongest personal opinions for and against them, which can make it a somewhat controversial topic, especially if the patient doesn't feel fully informed or supported by their care team or personal circle.

Different exposure-based approaches can vary in practical application when it comes to how personal boundaries and fears are treated, whether or not medication is utilized, who is overseeing the treatment, organizational support, whether operating on a cognitive-behavioral or acceptance-mindfulness based foundation, and the public relations issues many exposure-based models face that dampen patient interest in confronting challenging and discomforting physical and emotional states due to the way the treatment is presented or carried out.

The first part of this article will focus on examining the Fear Avoidance Model and several exposure-based approaches that differ from each other in application, so that readers can have a better understanding of how each style works and what does or does not interest them when considering desensitization techniques. The second part will be some of this author's personal opinions that stick out in my mind after writing this analysis, based on the research done for this article and my personal lived experience, which readers are encouraged to take with a grain of salt and to use their own discretion when incorporating or disregarding.

As always, this is provided to be informational and intended to assist people in making more informed decisions in their own best interest, so take what works for you and your circumstances. Due to the nature of this subject matter, it ended up being considerably longer than my previous singular topic pieces in an attempt to be not only comprehensive, but also conscientious, tactful, balanced, and fair; please take brain breaks if the wall of text gets to be too much because this is a lengthy read. Let's dive in.

An Educational Analysis

Exposure-based therapies, particularly graded exposure, were originally developed for mental health conditions with a strong fear-related component, such as phobias, anxiety, PTSD, and OCD; often conditions where the fear is out of proportion to the harm potential in the situation or the likelihood of the occurrence of a negative event—in other words where the threat appraisal is magnified and ruminated upon and intertwined with feelings of helplessness: this is catastrophizing.[1]

95% of published research on the topic of catastrophization is on the adjacent concept of pain catastrophization rather than the original definition as it related to mental health conditions, and in the different fields the terms are utilized in somewhat different ways.[1] Pain catastrophizing—where the threat appraisal of the potential harm of a person's pain or symptoms is magnified—has considerable research behind it and is recognised as one of the leading indicators of pain chronification, pain severity, and disability. Pain catastrophizing is not about an individual exaggerating their reports of their symptoms or their subjective experience of pain, nor should patients' medical conditions be dismissed or stigmatized by medical providers leading to insufficient medical care as pain catastrophization cannot create a condition out of nothing. Indeed the concept of pain catastrophizing, while useful in some ways, is detrimental in others as it can become a bludgeon to shame chronic pain patients or deny them necessary care, and many pain patients (>30% of the 45% who are aware of the concept of pain catastrophization, or over 66% when only considering pain patients who have heard of the term) and pain researchers find the term problematic or representative of larger failings within the medical system when it comes to the treatment of chronic pain patients;[1] some have put forward the term "catastrophic worry" about pain as an alternative term that covers the same core concepts of negative appraisals, repetitive thinking, and ineffective coping, but with a more positive framing on ineffective problem solving or emotional regulation, though others promote that changing the term will not address the underlying beliefs of providers that cause the shaming and stigma.[1] Regardless, due to the sheer amount of content in the field about pain catastrophizing in relation to exposure-based therapies, it needed to be addressed.

In summary, pain catastrophizing is a magnified threat assessment outstripping the actual harm that is persistently, negatively focused on and has strong elements of helplessness. Educating individuals—particularly those with nociplastic, centralized pain—on how the nervous system operates and how the pain signals and structures are dysfunctional can greatly diminish the threat appraisal individuals make about their pain and symptoms as they learn to differentiate between hurt [subjective sensation of distress or pain] and harm [significant or lasting damage] in the maladaptive, sensitized nervous system, reducing their magnification of threat value. Offering them information, tools, and reparative experiences within their control and ability can greatly increase their autonomy and sense of competency, reducing their feelings of helplessness. When a person's worldview is dominated by threats and a helpless inability to address those threats, continuously looping negative thinking and self-talk can dominate one's mental space, but when realizing the harms (significant damage,

distinct from hurt) are not as prominent as one previously thought and that there are actions one can take to help reduce the hurt, rumination can decrease too. The three primary pillars of pain catastrophizing are not insurmountable obstacles, and addressing them can immensely improve a person's quality of life, autonomy, and ability to function independently.

A similar concept is pain-related fear, or the view of pain as threatening or the fear of pain, activity, or (re)-injury.[2] Pain catastrophization may be a more generalized appraisal of the consequences of pain while pain-related fears are more specific appraisals of the probability of pain occurring from a particular activity;[3] both of these are threat value appraisals and threat value is probabilistic with the actual measure, probability, or intensity of a negative outcome involved in varying life experiences being unknown.[1] In anxiety-based mental health conditions such as phobias of germs or heights, where the objective probability of a negative outcome is extremely low, the degree of the threat value associated with the stimulus or event is often magnified; this often cannot be directly translated to pain conditions to objectively measure whether threat appraisals of the subjective experience of pain occurring are an actual threat or an exaggerated threat since there is no objective external reference for the actual threat of pain sensation.[1] Whether the Pain Catastrophizing Scale can accurately assess the "exaggeration of threat value of pain" since there isn't an objective external reference for the "actual threat of pain" is another issue that has been put forward for the medical community to address that currently remains unanswered.[1] While pain catastrophization is more focused on in pain literature as a signifier of increased disability and potential for chronicity, both catastrophizing and pain-related fears are often indicators of more severe avoidance and associated difficulties that require intervention for improved quality of life.[1, 2, 3]

Repeated, reparative experiences to disaffirm the learned expectation of harm are useful, and this is where exposure-based therapies can come into play. Exposure-based therapies utilize associative learning and the Fear Avoidance Model of Musculoskeletal Pain, which posits that for those with pain-related fear or pain catastrophizing who avoid activity, the lack of pain can reinforce that avoidant behavior, which in the long-term can lead to hypervigilance, disuse, and increased disability.[2] Exposure-based approaches intend to help decrease avoidant responses and behaviors by giving a person new associative learning experiences to overwrite their older memories and disassociate the stimuli with the fear they felt in the past by realizing that—while what they are experiencing may not be pleasant—it is not causing them harm.[4] However, one critical component is that for exposure therapies to be successful, there must be a violation of the expectation of harm so that those new memories can be created that offer detachment of fear from the stimulus; if a person is actually harmed during exposure, their associative learning of fear with the stimulus is reinforced and validated, not weakened and disaffirmed. This is particularly true for those with lived trauma experience who already have undergone harm (and perhaps repeated, substantial harm) in relation to the feared situation or stimulus.

Exposure-based therapies often have a major public relations problem, both with patients

and even some undereducated providers, particularly when it comes to medical providers guiding treatments for chronic pain patients in a physical therapy setting who do not have appropriate training in mental health topics or tools. Many exposure therapies are often misidentified with *flooding*, which involves immediate, intense exposure to the most feared stimulus first and remaining in that sustained sympathetic state until the fight or flight response can no longer maintain its activity; flooding works in the opposite direction of the ladder of fears of graded exposure, and it does not have the same empirical evidence behind it and is a far more controversial practice.[5] Flooding is deliberately overwhelming, purposefully moving people beyond their Window of Tolerance where intense emotions can still be processed in a healthy, regulated manner, and has the potential to make a person's fearful associations with a stimulus even greater, though it is a quicker alternative to the slower, stepped, more gradual exposure and desensitization options.

Graded exposure is a hierarchical, laddered model where increasingly feared or challenging experiences are rated based on a person's subjective ability to confront or endure the stimulus.[6] Thresholds [where a person starts to notice their discomfort] and tolerances [where a person can no longer withstand the discomfort] are established; the goal is to gradually increase both the threshold and the tolerance levels so that an individual can be more functional, autonomous, and have an increased quality of life. These goals should be sequential and manageable, with the first goal being within the patient's limits to set a positive reinforcement and new goals not being incorporated until the current goal is achieved. There are two main components to graded exposure: behaviorally habituating to a feared stimulus supported by positive reinforcement and cognitively disconfirming fear-based predictions allowing for psychological restructuring.[2] Some researchers have proposed renaming graded exposure to "Supported Approach of Feared Experiences – Cognitive Behavioral Therapy (SAFE-CBT)" to better convey the safe, supportive, necessary, and helpful aspects of properly carried out exposure therapies and to move away from the common conceptions and beliefs of many clinicians and patients of unethical, intolerable, too distressing, and harmful.[6]

Desensitization works on the same principles as graded exposure, though it adds a focus on relaxation techniques—such as deep breathing, progressive muscle relaxation, visualization, guided imagery, or mindfulness meditation—to assist in activating the parasympathetic nervous system and calming the sympathetic nervous system, making the process more tolerable. When utilizing desensitization for sensitized chronic pain conditions, it is something best done regularly; at first it will need to be a conscious effort, but after habituating to the process, one may find that the process continues in the background as a person goes about their daily life, allowing a person to remain aware of the sensations without it impeding them as much.[7, 8]

Graded activity, in a similar vein to graded exposure, is based on operant conditioning and the Fear Avoidance Model of Musculoskeletal Pain, though it focuses on increasing activity rather than reducing fear; it utilizes positive reinforcement and learned consequences to promote individual tolerance for specific activities meaningful to daily living or healthy

behavior based on the patient's reported difficulty or contextual relevance and goals are performed on a time- or intensity-contingent schedule rather than being pain-contingent.[9] Once baseline tolerances are established, goals that are specific, measurable, achievable, realistic, and time-targeted (SMART) are established with the first goal quota being below the patient's baseline tolerance level to obtain a positive interaction of achievement engaging with the program and give the individual a sense of control and efficacy; in following sessions, goal quotas are increased in a balanced manner with knowledge of the patient, their baseline tolerance levels, and activity load. Positive reinforcement after goal achievement includes attention, praise, activity rest, and schedules demonstrating occurrence of desired health behavior. Graded activity, graded exposure, and more standard physical therapy all show similarly effective results in terms of pain, disability, quality of life, global perceived effect, return to work, physical activity, physical capacity, and kinesiophobia (fear of movement due to pain or injury) when studied in patients with persistent, nonspecific low back pain.[6, 10, 11]

Psychologically Informed Physical Therapy (PIPT) founds itself on the biopsychosocial model of care and merges psychological treatments into physical therapy sessions that address maladaptive cognitions, emotions, or behaviors with physical treatments for more effective results than standard physical therapy treatments alone.[2] PIPT shows a small but significant improvement on functionality, disability, and pain, as well as mitigating psychosocial risk; however, this style of physical therapy does call for a marked difference in delivery of care. Both Cognitive Behavioral Therapy (CBT) and Acceptance and Commitment Therapy (ACT) styles are utilized. Maladaptive behaviors, positive coping, dysfunctional thoughts, and increased confidence are addressed by CBT. However, recognizing that some aspects of chronic pain are not alterable, ACT shifts the focus from symptom or pain reduction to acceptance of the situation as it is and pursuing value-oriented goals, openness to experiences without avoiding them despite unpleasantness, psychological flexibility and viewing thoughts as mental events that come and go without letting them drive behavior, awareness in the form of being able to observe internal experiences without identifying with them, and activity engagement involving clarifying values and committed action.[2]

While exposure-based approaches originally developed out of the CBT branch of psychology, acceptance and mindfulness approaches have also adapted their own versions, though with considerably different viewpoints, and they have shown to be effective in addressing chronic pain.[7, 12] While most other pain management approaches fundamentally label pain as "bad" and seek to reduce or eliminate it, acceptance and mindfulness-based approaches posit that suffering is an inherent part of the human condition and focus on identifying values and desired goals and then encouraging behaviors consistent with them.[13] ACT and Mindfulness-Based Stress Reduction (MBSR) do not emphasize logic and "helpful" or "dysfunctional" thinking like CBT does; instead they promote psychological flexibility and the pursuit of valued activities by accepting pain and its associated thoughts and emotions rather than challenging them. These psychological styles embrace being fully present in the moment, using the entirety of one's sensory apparatus to make decisions consistent with one's values, and applying cognitive defusion to distance oneself from their thoughts instead of

overidentifying with them; as opposed to the CBT style of changing “unhelpful” thought patterns that then create emotional states (where changing what you think changes what you feel), ACT and mindfulness-based styles posit that thoughts and emotions are intertwined and can arise together and so it addresses emotions as well as thoughts.[13] ACT endorses recognizing the self as distinct from the struggles, being willing to experience the struggles as they are without imposing a narrative, and identifying and moving towards values regardless of present moment struggles while refraining from avoiding unpleasant emotions.[13] MBSR focuses on nonjudgment and detaching physical pain from emotional suffering via awareness of the body, breath, and activity; it is proposed the nonjudgmental observation is similar to exposure-based therapies and increases tolerance while also addressing the thoughts and emotions that surface in response to the pain. By learning to sit with discomfort and create space for it to respond intentionally, there is less likelihood for instinctual, maladaptive responses, such as pushing through or avoidance.[13] In those with CRPS, three main themes for ACT-based treatments were identified: flexible persistence, or the ability to persist with or adapt behaviors that are in line with one’s own values regardless of negative emotions, unwanted thoughts, unpleasant physical sensations, or other people’s expectations; reduced fear and avoidance, by practicing not avoiding possibly painful situations, managing fear more constructively, and increasing their knowledge and understanding of their condition which increased self-acceptance and self-awareness; and increased connection both within the self and with others, or a better understanding of one’s own condition, values, needs, and feeling more understood by family members, medical professionals, and peers with CRPS (within the context of this study which involved a specific family education day and CRPS group support).[14]

Emotional-Awareness and Expression Therapy (EAET) focuses on the posited connection between emotional and physical pain, which may be particularly relevant for those with chronic pain (and in CRPS, studies show that emotional and pain processing happen on the same brain pathways, as discussed in the Centralized Pain article linked above); research appears to support that stressful and traumatic events, especially early-life traumas or Adverse Childhood Experiences (ACEs) or those events resulting in PTSD, have strong associations with chronic pain disorders.[13] Literature suggests that those with interpersonal, relational trauma appear to respond suboptimally to psychological pain interventions, which may be a result of the interventions not targeting the disrupted emotional or relational processes.[13] Due to the shared neurobiological structures of emotional and physical pain, damaged or disrupted emotional or relational neurological processes may sustain or augment physical pain. In relation to widespread pain, particularly CRPS’s sister condition of fibromyalgia, EAET was more effective than education and superior to CBT when considering pain improvement and symptom reduction, with 22.5% of those in the EAET group experiencing at least a 50% reduction in pain compared to 8% in the CBT group.[13] EAET involves: educating patients on the interconnectedness and overlap of brain regions responsible for both emotional processing and physical pain; how stress, trauma, and interpersonal conflicts can impact pain, especially if those experiences result in avoidance behavior of emotionally charged reminders; assisting individuals as they identify the avoided

emotional stimuli (relational conflicts, traumas), express emotions, and approach conflict via interactive learning meant to increase skills, confidence, and reflection; increasing self expression of emotions and fears via exposure strategies, assertiveness training, helping the patient rewrite pain narratives with a focus on empowerment and personal strength, emotional disclosure, and strategies for challenging defenses.[13]

Pain Exposure Physical Therapy (PEPT) was designed specifically for CRPS, and it is not focused on addressing fear of pain or on decreasing pain itself but rather on increasing function despite pain with the goal of patients resuming work, social life activities, and independent living without caregivers.[15, 16, 17] PEPT includes framing pain as a "false warning sign" and "reversible dysregulation of the nervous system." Patients are instructed to ignore their pain signals and informed that the physical therapist will not respond to any pain reports and family and social supports are also told to not respond to pain reports; complaining of pain is discouraged and pain is not considered a subject of debate or a reason to reduce the intensity of regimen or activities.[18] All medications are discontinued in an attempt to reverse cortical reorganization and restore brain communication. Exercises focus on progressive loading and passive approaches to increase strength, function, and range of motion; desensitization and "self-forced" behaviors are prioritized to push the limits of a person's physiological boundaries without regard for pain limitations. While some short-term symptom worsening is likely, long-term worsening is not reported and is not considered a safety risk for reducing intensity of the treatment according to the designers.[19] While analyses revealed that conventional therapies (particularly graded exposure) and PEPT did not reveal significant differences—or more specifically that analysis did not reveal that PEPT was superior to conventional approaches—particularly when it came to addressing pain-related fear or short-term improvement in disability scores; however, after a nine-month follow-up, PEPT did show a 7.8 improved difference on a 70 point disability function score and a 1.8 improved difference on a 10 point pain score over conventional approaches.[18] PEPT centers disuse in its treatment model as opposed to fear, with the goal of reincorporating the limb back into the body schema, working on the premise that non-use leads to condition deterioration.[18] "Bootcamp" approaches, particularly those oriented at children, can be examples of this style of treatment. PEPT's explicitly states it takes patients to their physiological extremes and pushes past their boundaries without regard for their internal state or while explicitly disregarding it; while there are aspects of this approach this author personally appreciates, which I will expound upon below, I do recommend caution with this modality for anyone with interpersonal trauma where their needs and emotions were repeatedly disregarded or dismissed, especially if that was a chronic pattern of behavior that occurred during childhood.

Patients interviewed about what they valued when engaging in exposure-based approaches stated the importance and value of: support and sympathy from clinicians and personal support structures; clear, manageable goals and the timing of moving to new exposures; autonomy and feeling in control; clinicians who require the patient to face challenges, who listen attentively, and who the patient enjoys talking to and trusts; clearly defined roles for patients and caregivers, particularly for parents of minors helping youths follow-up on their

exercises at home, so that both parties feel informed, motivated, and supported; the use of empathetic language, psychoeducation, and rewards; preventing unhelpful reassurance giving; having more than one external support person engaged in supporting the patient; perceived support and feeling understood by peers with the same condition and seeing others dealing with similar problems and how they manage them.[2, 4, 14]

While mirror therapy and graded motor imagery are not within the scope of this article, they deserve an honorable mention as they technically fall under exposure-based approaches and are both specifically recommended for CRPS,[16, 20] at least in the acute stage (<8 weeks) for best effect on pain and movement and intermediate stage to assist with stiffness and movement; though as individuals become persistent cases, it does appear that the effectiveness declines significantly.[21] It also appears these approaches may be best suited to those whose pain prevents limb movement and thereby inhibits engagement in physical therapy exercises, allowing for pain reduction without movement before involving actual activity; results show that patients with severe pain appear to show a pain reduction, but those with moderate pain did not see much relief.[21] Similarly, Eye Movement Desensitization and Reprocessing (EMDR) psychotherapy is outside the scope of this article, but for those with severe trauma, particularly of the interpersonal nature, that may cause other treatments listed here to be problematic, due to an inability to feel safe and supported to the sufficiently required manner necessary, EMDR may offer a way forward.[22, 23]

When it comes to CRPS and other centralized pain, physical therapy involving some sort of exposure to assist in desensitizing the nervous system is generally recommended.[14, 16, 20, 21, 24, 25, 26, 27] Movement and re-engagement of the affected area are strongly recommended while immobilization is discouraged to prevent worsening and/or chronicity. While many will no longer be considered to have CRPS after a year, 22-64% of patients will develop persistent CRPS with symptoms lasting longer than three years, and only 5.5% of patients report all of their symptoms fully resolving to be entirely asymptomatic within a year.[16, 26] CRPS carries a considerable economic impact, with average treatment costs being 13 times greater and the number of lost working days 20 times higher after an accident in patients with CRPS than those without;[26] treatments that can assist the independence, functionality, and quality of life of individuals who have to seek more expensive medical care more regularly while being much more limited in their ability to secure income can be assistive. The majority with CRPS would fall into the 8% of Americans considered to have “high impact chronic pain” that has limited one’s work or life activities most days or every day during the last six months.[13] Current clinical guidelines recommend that basing the treatment framework on a biopsychosocial approach is best evidence-based practice, which incorporates the multidimensional nature of chronic pain including biological, psychological, social, and contextual factors for which important pain prevention and management involves adaptive self-management and safe, effective treatments tailored to individual preferences, pain susceptibility, and responses.[13]

Those with acute CRPS most often had their functional limitations determined by pain severity (life impact of pain, including intensity, pain-related disability, and emotional

distress) rather than fear, while those with persistent CRPS most often had functional limitations determined by the perceived harmfulness of activity rather than the impact of pain intensity (subjective degree of sensory pain experience), so addressing fear-avoidance and harm perception leading to disuse is highly practical in this condition, and the earlier the better for improved outcomes, so that individuals can more accurately assess what will be harmful, hurtful, and what makes them afraid.[21] CRPS patients also have been demonstrated to display "neglect-like" behavior (or reduced awareness of stimuli on one side of space, which often occurs after brain damage due to stroke, though in CRPS brain lesions are not noted) of their affected limbs, which undercuts some of the belief that protective actions to minimize movement are voluntary. The two intertwined neglect-like behaviors are "cognitive neglect", which involves the body part being perceived as foreign, and "motor neglect", which involves patients needing to focus mental and visual attention to move their affected limb.[28] Of studied individuals with CRPS, 84% verified experiencing at least one of these neglect behaviors and 47% experiencing both.[28] Regardless of the source—whether fear, pain severity or intensity, neglect-like behavior, or perceived harmfulness—disuse can further entrench negative outcomes and increase disability in the long-term.

While CRPS has a centralized pain component, it also has other contributing factors, including ischemia-reperfusion injury cycles which are thought to be the source of the Vasomotor Dysfunction requirement in the Budapest Criteria.[28, 29, 30] Here disuse plays a critical role as areas that aren't moved require less blood and nutrient resources from an efficiency standpoint, which starts the vascular constriction and begins the IRI cycle. Keeping mobility—even if it is only small motions—helps keep blood vessels wider and blood circulation flowing to the affected area, preventing the highly detrimental "cold" ischemia-dominant CRPS subtype that is so common in persistent cases from settling in (more) and digging a deep(er) rut that is extremely difficult to climb out of and backfill. This crucial reasoning of improved circulation is why immobilization is so strongly discouraged for individuals with CRPS and why some sort of physiotherapy or exercise is recommended to undercut the ischemia-reperfusion injury cycle and the central sensitization that can be sustained by little nociceptive or inflammatory input.

In summary, there are several types of exposure-based approaches intended to help individuals maintain their functional movement, lower the hypersensitivity of their nervous system or at least better tolerate the discomfort, and increase their independence and autonomy in a supported, controlled, progressive way. With the variety of options available, people with different needs and engagement preferences can choose options that work for them. While the work broadly categorized as "desensitization" is generally unpleasant, challenging, difficult, and ongoing labor, it can be the difference between being able to tolerate clothing (for hours) or not, having (all) the lights on or not, being able to go shopping (in densely populated stores) or not, being able to traverse the stairs (or the hiking trail) or not, and a broad array of aspects of daily interactions at many levels and intensities. It is important work and a versatile tool when it comes to living an autonomous life in one's own best interest.

A Personal Perspective

Now this article has already gotten quite long and you've made it through the important bits, so feel free to stop here if you've gotten what you need, as the rest is my individual opinion as an unlicensed, non-medical-professional, but if you're interested in my thoughts—taking into account all the research I have done over the years and my lived experience—I will share that for those who are curious. I have four main reflections after the work I have put into researching this article.

1. When setting goals with graded approaches, it doesn't have to be your aim to reach the top rung of the ladder, where even an able-bodied person would struggle. Some may want to be able to tolerate wearing denim jeans for eight hours while others want to be able to tolerate cotton sweatpants for three hours while other want to tolerate a soft skirt for an hour while others would just like the blankets to be able to touch them; some may aim for lifting 100 pounds, some for 30 pounds, and some for 10 pounds, while others want to be able to use their affected hand to brush their hair and do basic grooming. People have different circumstances, different needs, and different desires; make your goals fit your life and be manageable. You can always make more intense goals later if you meet your SMART ones first. Whatever your personal end goals, increasing tolerance over time is the aim, and hopefully your threshold for discomfort increases as well.

2. Readers have likely noticed that all of these different exposure approaches fall under two main umbrellas of either focusing on reducing fear or increasing activity. In acute CRPS, activity limitations were more related to life impact of pain severity than fear; in persistent CRPS, activity limitations were more related to threat value appraisals than sensory experience of pain intensity. Neither of these CRPS stages prioritize fear as the primary motivating factor in avoidance over other sustained concerns; however, if fear is a factor in decision-making, it definitely should be addressed, particularly as fear can be one of those tricky emotions that hides itself under anger or sadness so that it is more difficult to recognise. I personally am more drawn to the activity-oriented approaches instead of focusing on fear-reduction, but I do think is it important to include patient education on harm versus hurt and maladaptive neurological processing in CRPS and where harm can actually be done more easily for those of us with this condition, so that threat value appraisals reflect where we are more vulnerable to harm than someone without CRPS (such as temperature extremes and a tendency for slow healing both after injury and illness).

3. This brings us to Pain Exposure Physical Therapy (PEPT), which—in my opinion—is the approach closest to flooding and prioritizes pushing through and ignoring pain. Now I will openly say I have not gone to a professionally-led PEPT-style physical therapy, so I am only speaking from what and how it was written in the several papers I read about it and from my own personal approach of how I attempted to deal with my CRPS before I was diagnosed, had any help, or even knew what it was, which very much aligns with what I read in the published articles of basically "don't acknowledge it, push yourself past your physical and emotional limits over and over again, and hope you eventually get better before you burn out." An

actual, professional session may be led differently and I can only speak to what I read and the way it was framed with the language used. Language is something I value, and the way we talk about things matters.

I appreciate that PEPT is disuse-centered rather than fear-centered; I find that practical. I appreciate that it does not attempt to convince people that their pain needs to reduce before they can re-engage with meaningful activities that hold value to them or that if they commit hard enough for long enough to the program that their pain will reduce; I respect that they are not attempting to sell a false promise or paint a pretty picture of guaranteed pain relief to motivate people to increase their movement. Moving hurts; not moving hurts more in the long-term. I understand that their reasoning for stopping all medications is due to brain connectivity; I don't quite agree with it, but I can see their argument. As someone highly sensitive to most medications, my personal stance is for limited prescription medications tailored to my individual responses that have proven their efficacy and have no or tolerable side effects, so one may be inclined to think I would be in agreement with their no medication stance, but that is not the case. Some of my medications, particularly my low-dose naltrexone, would have to be pried from my cold, dead fingers, so I can't say I'd consent to that aspect of their approach.

A lot of the language in the papers I read on PEPT by the designers was heavily focused on an ability to return to work, support oneself without caregiving aid, not expressing one's hurt, society ignoring your pain signals and demanding you continue, and purposefully pushing past your boundaries while disregarding your body state. It was extremely functional and repressive. The reasoning is to train the brain that it isn't that bad and to stop responding with alarm. I see their reasoning, but I don't agree with the method, particularly for people with interpersonal trauma or those who have repeatedly had their needs or emotions dismissed or diminished, especially as a pattern in childhood.

As we have covered several times in multiple of my written works now, the pain processing and emotional processing happen in the same brain structures and pathways. Societal rejection, interpersonal conflict, or emotional upheaval can cause physical pain because they utilize several of the same biological substrates. The framing of language in the original PEPT papers comes across as quite closed off to emotional experiences or to even the acknowledgment of a person's physical state. I would have a much higher personal opinion of this approach if there was more openness to being in pain while carrying out actions and an ability for others to validate a person's subjective state with something as simple as an, "okay, I hear you" while the activity continues. Maybe in-person approaches aren't the same as what comes across in the papers, but—to me—this seems like stonewalling interoception or, perhaps more accurately and even worse in my opinion, giving your body the silent treatment: a refusal to communicate, engage, or interact with the signals the body is sending, obstructing the pain conversation and making sure everyone around you does too in an attempt to control the situation and force it to comply with your desired outcome of the pain shutting up and going away, for the discomfort and distress to submit to the dismissal and disappear.

I personally tried that for years, and it ended up not working out for me well at all. The more I ignored my pain, the louder it screamed. The higher I built my wall, the bigger my pain would grow to crawl over the top. I personally can't endorse the method, and the silent treatment in interpersonal relationships is a recognized method of emotional abuse and coercive control. Now, if there was an adjustment in PEPT to a more "parallel play" approach with pain, I would like it a lot better. Parallel play is when two people are in the same space comfortably with each other doing their own individual things, not interacting, influencing, or interfering with what their companion is doing; it involves an awareness of each other, boundaries, trust, cooperation, autonomy, increased connection, and improved motivation and self-care. "Being alone together" is distinct from ignoring someone or shutting down defensively or dominantly manipulating them into invisibility by refusing to acknowledge they exist.

A large part of acceptance and mindfulness oriented therapeutic approaches involve openness to discomfort and nonjudgmental observation; it appears that the PEPT approach does not utilize these tenets, which is an aspect I require in my activity-oriented exposure approach, but rather it posits actively withholding from pain experience or expression and the language employed in the papers definitely conveys judgment in my opinion, with the second to final paragraph of the final trio of papers on PEPT from the original designers openly implying those with chronic complaints are either too fearful, too unmotivated, or don't believe enough in their own capabilities, which frankly rubbed me the wrong way. So while there are aspects of this approach I can appreciate, due to some major concerns related to practical application within the underlying framework, it is not an approach I would personally pursue, and it is the only one of the listed approaches in this article I would be actively unwilling to attempt in the form described due to ideological reasons.

4. While exposure therapies originally come from CBT styles and I do recognize that CBT as a whole can be highly useful for a broad array of people, I personally prefer the ACT, MBSR, and EAET style approaches, particularly for those with high levels of interpersonal, relational trauma or emotional conflict or repression or neurodivergence, particularly if those traumatic stressors happened in early childhood before age seven in the stages of development before logical, organized reasoning. CBT is a very "top-down" processing method (aka the conceptually-driven or hypothesis method) which relies heavily on the prefrontal cortex; top-down styles tend to not take the body or nervous system into account, and when we're experiencing sympathetic activation (or as I prefer to call it in my own CRPS journey a "sympathetic strike"), the prefrontal cortex gets bypassed and we operate on lower levels of brain functions in a process known as "flipping your lid." "Bottom-up" processing (aka the data-driven or sensory method) relies on sensory information from the body; in the context of trauma and pain, these environmental signals from the rest of the nervous system indicate whether a situation is perceived as safe or threatening and bypass the prefrontal cortex, and bottom-up approaches acknowledge and work within the framework of dysregulated nervous systems as opposed to top-down approaches where what you think creates what you feel. For those with trauma—especially repeated, relational trauma from childhood, I believe bottom-up approaches are superior, or that a mixed approach that relies more heavily on bottom-up than top-down processing should be utilized. Those who are neurodivergent, particularly

those who are autistic, are much more likely to operate on a bottom-up basis and benefit from similar therapeutic approaches. I think that learning the common cognitive distortions taught in CBT and which ones we are personally prone to and working to think in an undistorted manner is good and healthy, but CBT would not be my first choice as a high impact chronic pain patient, especially if there was complex trauma or a neurodivergent developmental condition comorbid.

This article has gotten away from me a bit, now clocking in at 14 pages and 6.6k words, so I am going to wrap this up. This was actually a fairly challenging paper for me to put together, so I hope that the main body was informative, fair, balanced, and delivered with consideration, and that my perspective segment held interest or value to someone.

Thanks for sticking with me, I hope you learned something, and I hope to see you next time.

References

1. Sullivan, Tripp, Pain Catastrophizing: Controversies, Misconceptions and Future Directions (Journal of Pain, 2024) ↩
2. Rogelio et al, Psychologically informed physical therapy for musculoskeletal pain: current approaches, implications, and future directions from recent randomized trials (Pain Reports, 2020) ↩
3. George et al, Comparison of Graded Exercise and Graded Exposure Clinical Outcomes for Patients With Chronic Low Back Pain (Journal of Orthopaedic & Sports Physical Therapy, 2010) ↩
4. Teunisse et al, A scoping review investigating the use of exposure for the treatment and targeted prevention of anxiety and related disorders in young people (JCPP Advances, 2022) ↩
5. Becker-Haimes et al, It's all in the name: why exposure therapy could benefit from a new one (Current Psychology, 2022) ↩
6. Furnham et al, Treatment hurts: Lay theories of graded exposure in the treatment of four anxiety disorders (European Journal of Psychotherapy & Counselling, 2013) ↩
7. Harrison et al, Best-Evidence for the Rehabilitation of Chronic Pain Part 1: Pediatric Pain (Journal of Clinical Medicine, 2019) ↩
8. Kelly-Davies, Pain Desensitization: How to Overcome Fear of Chronic Pain (Pain News Network, 2021) ↩
9. Tegner et al, The effect of graded activity and pain education (GAPE): an early post-surgical rehabilitation programme after lumbar spinal fusion—study protocol for a randomized controlled trial (Trials, 2020) ↩
10. Magalhaes et al, The short-term effects of graded activity versus physiotherapy in patients with chronic low back pain: A randomized controlled trial (Manual Therapy, 2015) ↩
11. Macedo et al, Graded Activity and Graded Exposure for Persistent Nonspecific Low Back Pain: A Systematic Review (Physical Therapy, 2010) ↩

12. Bazzari, Bazzari, Advances in targeting central sensitization and brain plasticity in chronic pain (The Egyptian Journal of Neurology, Psychiatry and Neurosurgery, 2022) ↩
13. Driscoll et al, Psychological Interventions for the Treatment of Chronic Pain in Adults (Psychological Science in the Public Interest, 2021) ↩
14. Johannesson et al, Patients' experiences of treatment-relevant processes in multimodal pain rehabilitation for severe complex regional pain syndrome – a qualitative study (Disability and Rehabilitation, 2023) ↩
15. van de Meent et al, Safety of "pain exposure" physical therapy in patients with complex regional pain syndrome type 1 (Pain, 2011) ↩
16. Kavka, Harmful or safe? Exposure and pain provocation during physiotherapy of complex regional pain syndrome I: a narrative review (Journal of Back and Musculoskeletal Rehabilitation, 2023) ↩
17. Barnhoorn et al, The effectiveness and cost evaluation of pain exposure physical therapy and conventional therapy in patients with complex regional pain syndrome type 1. Rationale and design of a randomized controlled trial (BMC Musculoskeletal Disorders, 2012) ↩
18. Barnhoorn et al, Are Pain-Related Fears Mediators for Reducing Disability and Pain in Patients with Complex Regional Pain Syndrome Type 1? An Explorative Analysis on Pain Exposure Physical Therapy (PLOS One, 2015) ↩
19. Barnhoorn et al, Pain exposure physical therapy (PEPT) compared to conventional treatment in complex regional pain syndrome type 1: a randomised controlled trial (Rehabilitation Medicine Research, 2011) ↩
20. Shim et al, Complex regional pain syndrome: a narrative review for the practising clinician (British Journal of Anaesthesia, 2019) ↩
21. Pollard, Physiotherapy management of complex regional pain syndrome (New Zealand Journal of Physiotherapy, 2013) ↩
22. Tesarz et al, Effects of Eye Movement Desensitization and Reprocessing (EMDR) Treatment in Chronic Pain Patients: A Systematic Review (Pain Medicine, 2014) ↩
23. Vock et al, Group eye movement desensitization and reprocessing (EMDR) in chronic pain patients (Frontiers in Psychology, 2024) ↩
24. de Jong et al, Reduction of pain-related fear in complex regional pain syndrome type I: The application of graded exposure in vivo (Pain, 2005) ↩
25. Birklein, Dimova, Complex regional pain syndrome–up-to-date (Pain Reports, 2017) ↩
26. Biochat et al, The Role of Nonmedical Therapeutic Approaches in the Rehabilitation of Complex Regional Pain Syndrome (Current Treatment Options in Rheumatology, 2020) ↩
27. den Hollander et al, Expose or protect? A randomized controlled trial of exposure in vivo vs pain-contingent treatment as usual in patients with complex regional pain syndrome type 1 (Pain, 2016) ↩
28. Groeneweg et al, Regulation of peripheral blood flow in Complex Regional Pain Syndrome: clinical implication for symptomatic relief and pain management (BMC Musculoskeletal Disorders, 2009) ↩
29. Coderre, Bennett, A Hypothesis for the Cause of Complex Regional Pain Syndrome –

Type I (Reflex Sympathetic Dystrophy): Pain Due to Deep-Tissue Microvascular Pathology (Pain Medicine, 2010) ↩

30. Coderre, Contribution of microvascular dysfunction to chronic pain (Frontiers in Pain Research, 2023) ↩

Subscribe if interested in email notifications for new content uploads.

Email

☐ I accept the privacy policy

Subscribe

