

A Dual-Action Non-Invasive Treatment Model for Nociceptive Pain and Psychosocial Disorders

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Abstract

The complexity of chronic pain with interfering comorbidities negatively affects pain management and necessitates a multimodal biopsychosocial treatment approach, such as ReAttach. This ReAttach protocol for chronic pain, which involves a series of structured sessions focusing on affective and cognitive processes, describes the theoretical background from which ReAttach Affect Coaches might work when dealing with nociceptive pain, nociceptive pain, neuropathic pain, or a combination of these modalities. In acute pain, Wiring Affect with ReAttach (W.A.R.A.) and the Forgive and Forget Hood (FFH) are discussed for their promise in preventing acute pain from becoming chronic by promoting neuroplasticity and reducing hypersensitivity. It is remarkable how fast ReAttach can reduce altered pain transition, pain regulation, and pain perception in nociceptive and neuropathic pain, as described in the examples. Patient narratives and a case study outline how to build tailored ReAttach sessions for different chronic pain manifestations. The importance of using the M.I.S.T. and the New Mind Creation to target complexity is specifically emphasized. While ReAttach techniques are promising, further research is needed to fully explore ReAttach's potential in chronic pain patients and facilitate its broader implementation in healthcare.

Keywords: ReAttach, Chronic Pain, Nociceptive Pain, Nociceptive Pain, Neuropathic Pain, W.A.R.A. FFH

Introduction

Chronic pain is long-term or recurring pain that lasts longer than three to six months, often after the original cause (such as an injury or infection) has healed [1]. Chronic pain may occur because the nerves and central nervous system become oversensitive, causing the pain to lose its warning signal and the pain system itself to take on a maintenance role. When the pain system assumes this maintenance role, it can lead to an imbalance in the nervous system, even without an apparent physical cause. Velasco et al. (2024) dispute the assumption that central sensitization causes chronic pain, since they found a lack of evidence of the occurrence of central sensitization in chronic pain cases [2].

There are different manifestations of chronic pain, such as neuropathic pain (nerve pain), nociceptive pain (alarming for dangerous injury), and centralized pain syndromes like fibromyalgia, arthritis, and chronic back pain [3, 4]. Comorbid psychological problems, such as anxiety, depression, sleep disorders, and physical dysfunction, are the rule rather than the exception [4,5,6]. Li et al. (2025) state that there is a bidirectional relationship between chronic pain and emotional dysregulation

disorders [7]. Therefore, they advise future research to focus on more integrated and targeted therapeutic strategies that address the neurobiological underpinnings of this comorbidity. Focusing on reducing the burden of chronic pain *and* its associated emotional disorders is essential to ultimately enhance the quality of life of individuals affected by these disorders.

Chronic pain is a complex condition that has significant biopsychosocial effects, impacting individuals far beyond the physical experience of pain. On a personal level, chronic pain is associated with functional impairment, a decrease in overall quality of life, sleep disturbances, and psychological challenges, including depression and anxiety [8]. Socially, it can disrupt relationships, limit engagement in meaningful activities, and contribute to feelings of social isolation. Economically, chronic pain leads to decreased productivity, increased absenteeism from work, and higher healthcare costs, thereby imposing a considerable burden on patients and healthcare systems alike. Recognizing chronic pain as a multidimensional issue, rather than merely a symptom, enhances our understanding within health sciences. The biopsychosocial model highlights the interplay between biological mechanisms and cognitive, emotional, and social factors, which can intensify the pain experience [9].

As a result, chronic pain not only restricts physical capabilities but also reshapes individual identity, restricts autonomy, and alters social roles. This complexity highlights the necessity for multidisciplinary management strategies tailored to address the various dimensions of chronic pain.

Chronic pain has significant societal consequences, affecting not only individuals but also the economy, social interactions, and healthcare systems. From a public health perspective, chronic pain is a leading cause of disability worldwide. It results in reduced workforce participation, early retirement, and substantial productivity losses [10]. In Europe, the economic costs associated with chronic pain comprising healthcare expenses and indirect costs like lost work are estimated to exceed the combined costs of heart disease, cancer, and diabetes [11].

From the viewpoint of healthcare systems, chronic pain leads to increased demand for long-term medical care, frequent consultations, medication, and specialist services. This not only strains healthcare budgets but also highlights existing inequities, as patients suffering from chronic pain often encounter stigma, inadequate treatment, and limited access to comprehensive care [12].

On a societal and cultural level, chronic pain impacts social participation. Individuals experiencing persistent pain are more likely to face social isolation, marginalization, and dependency on welfare systems. This scenario undermines social cohesion and exacerbates health inequalities, particularly when socioeconomic status intersects with pain prevalence and treatment outcomes. In summary, chronic pain is a complex societal challenge that requires integrated strategies. These strategies should connect healthcare, workplace policies, and social support systems to address the long-term impacts of chronic pain effectively.

The complexity of chronic pain with interfering comorbidities negatively affects pain management and necessitates a multimodal biopsychosocial treatment approach. We suggest the transdiagnostic, multimodal ReAttach, integrated within healthcare and workplace systems as an accessible, non-invasive treatment of chronic pain.

ReAttach Protocol for Chronic Pain

The primary goal of the ReAttach protocol for patients with chronic pain is to decrease the negative impact on daily life functioning while promoting more effective pain management within the reach of the individual's abilities. A secondary goal is to reinforce the immediate social environment, since caregivers are often put under extra physical and mental strain by caring for a chronic pain patient. ReAttach focuses on the client in relation to his social environment. By offering ReAttach within the social support system, ReAttach can provide direct help. Strengthening the patient's pain self-management can have a positive effect on relationships.

Before we start offering ReAttach to a patient with chronic pain, we assess the individual's underlying pain mechanisms, including

psychological and social factors. We can efficiently combine the chronic pain assessment with psychoeducation about different manifestations of pain and the potential role ReAttach might play in pain regulation and pain (self)-management. Cohen et al. (2021) categorized chronic pain by its pathophysiology as nociceptive and neuropathic pain [3,13]. Kosek et al. (2016) proposed a third descriptor for chronic pain states: nociplastic pain, referring to alterations in pain processing without clear evidence for actual or potential tissue or nerve damage [14]. Wang & Doan (2024) found that a trial-and-error approach to pain management unfortunately remains typical. They urgently advocate for personalized, precision approaches to prevent side effects and delays in adequate pain treatment [13]. This protocol is a tool for the ReAttach Affect Coach to create personalized ReAttach treatment, selecting the techniques that align with the pain pathophysiology, the comorbidity, and the social environment. We describe the capabilities of ReAttach Affect Coaches, based on the pain pathophysiology which may overlap, and provide examples of a possible ReAttach approach.

Nociceptive pain

In nociceptive pain there is an actual ongoing inflammation or tissue damage [13]. Acute pain is a protective natural response to trauma or injury. Acute pain is a stress response, and if this response is not appropriately managed or if the pain is highly intense, it may gradually progress to chronic pain [14,15,16]. In nociceptive pain, there is initially a *sensor*, leading to negative affect *transmission* and eventually to *pain perception* [16]. Wiring Affect with ReAttach (W.A.R.A.) is a brief ReAttach technique interrupting the initial nociceptive stress response by wiring the negative affect *before* the sensory stimuli are transmitted, coded and perceived as pain [17, 18, 19]. Conducting the W.A.R.A. immediately upon the patient's awareness of nociceptive stimuli (*sensing*) enables them to sense the alarm, reflexively take action to prevent further tissue damage *without perceiving* pain.

Patient's narrative

"I had my left thumb wedged between the car door and my right hand while locking the car. As soon as I unlocked the car and opened the door, I applied the W.A.R.A. to prevent any pain. Just to be safe, I immediately followed that with a second W.A.R.A. The results were visible within minutes: my thumb turned blue, and there was a dent in the nail, which later fell off. I did not feel any pain; it could be "wired away" before it became noticeable."

Since W.A.R.A. helps to immediately downregulate the initial stress response, W.A.R.A. might be an interesting tool for the prevention of hypersensitivity. W.A.R.A. regulates negative affect and sensory overresponses, serving as a transdiagnostic intervention that can be used as a self-regulation tool [19]. In cases of ongoing nociceptive pain, with occurring inflammation or tissue damage, multiple W.A.R.A. 's can help alleviate the intensity of recurring pain sensations during recovery.

Neuroplastic pain

Neuroplastic pain arises from altered nociception, without the presence of tissue damage. This condition is perceived as widespread in the body and often co-occurs with other problems such as fatigue, sleep problems, cognitive problems, and multisensory hypersensitivity [20]. Nociplastic pain is also known as *central sensitization syndrome* [21]. Nociplastic pain involves dysfunction in the central nervous system pathways, including amplified pain-signal processing, decreased signaling of the descending pain inhibitory pathway, or both [22]. In contrast to nociceptive pain, there is no demonstrable tissue damage anymore. Nociplastic pain is usually associated with more subjective symptoms rather than objective findings, which makes understanding and managing it a formidable task [23]. To this day, it remains unclear what exactly causes nociplastic pain. However, the more widespread the pain, and the more pain occurs without demonstrable damage or inflammation, the more likely that there is a nociplastic component [24].

ReAttach suggests the hypothesis that sensory integration weakens or extinguishes due to hypervigilance resulting from a stressful event, illness, or intense pain stimuli [25]. Life-threatening situations, such as a stroke or COVID-19, might evoke insecure attachment patterns and overactivate the amygdala, resulting in an imbalance of the nociceptive system. If the sensory processing is weakened or extinguished, hypersensitivity in general, including towards nociceptive stimuli, occurs. This means that relatively harmless nociceptive stimuli might be perceived as threatful and experienced as intense pain. The brain reacts in a triggering manner, which is, in fact, a maladaptive response because there is no actual danger threatening tissue damage [25]. If this is the case, the immune system becomes overactivated, leading to inflammatory responses and nerve damage. If this is the case, the immune system becomes overactivated, leading to inflammatory responses and nerve damage. The body reacts from hypervigilance with a fight or flight or freeze response, which is not accurate and has physical consequences if these conditions become chronic. In patients with chronic pain, ReAttach trains optimal sensory processing and retrains the overactivated amygdala with New Mind Creation [26] to respond as under secure attachment conditions to bring the nociceptive system back into balance. However, in some cases minor specific sensory over-responses can be treated with a single W.A.R.A. self-regulation as described in the following narrative.

Patient's narrative

"When I was four years old, I was hospitalized for chronic bladder infections. To investigate what was wrong with my bladder, the nurses inserted a catheter, which made me anxious and caused a severe, stabbing pain at the entrance to my urethra. Since then, my body has reacted hypersensitively to any emerging bladder infection: I have consistently had a fever and an inflammatory

response as soon as I felt the stabbing pain at the entrance to my urethra. The W.A.R.A. was used as a self-regulation tool in response to the feeling of an incipient bladder infection (which was not actually present at that time). Even though there was not an actual bladder infection, I could still evoke that feeling. After the W.A.R.A., I could not do that anymore. Reality checks could only take place much later: when I developed a real bladder infection. I was worried about a bladder infection for about a week before I went to the doctor for testing. The hypersensitivity did not occur, nor did the intense pain or fever."

ReAttach techniques involve associations and sensory integration utilizing neuroplasticity, which, as noted by Song et al. (2024), might influence the pain transition, pain perception and pain regulation mechanisms [25, 27].

W.A.R.A. is based on a sensory integration exercise, elicited by the simultaneous firing of neural ensembles and unprocessed negative affect. W.A.R.A. may prevent the transition of nociceptive stimuli into pain perception and, by wiring unprocessed nociceptive stimuli, reduce sensory overresponse, thereby decreasing the intensity of pain perception.

Another interesting ReAttach technique influencing pain transition and perception through neuroplasticity is the Forgive and Forget Hood (FFH) [28, 29]. Research into the potential of the FFH in patients with chronic pain is still in its infancy. Since there is a clear association between chronic pain and depressive symptoms, both negatively influencing each other [4,5,6,7], the FFH is an accessible, brief exercise we can use to target the comorbidity. The results in the first pilot studies and Q-EEG analysis are encouraging [28, 29]. The FFH is not suitable in acute pain, but can be used to alleviate ongoing pain, stop rumination and depression and clear the mind. As a self-regulation tool the FFH is simple and accessible.

How to start

As an introduction to ReAttach techniques and to reduce sensory overresponsivity, the W.A.R.A. face-to-face is the best option. A requirement for performing the W.A.R.A. face-to-face is that the patient agrees to touching the backs of their hands. If this is too stressful, consider starting with the FFH as a self-regulation exercise. As mentioned earlier, chronic pain is often complex, so it is wise to work systemically, strategically, and offer tailored sessions. One tool that holds great potential in this regard is the M.I.S.T. (Mapping the Individual State of Mind). The M.I.S.T. helps you identify extreme scores on transdiagnostic factors that play a role during ReAttach [30]. It will show you if there are any special considerations you should be aware of. The M.I.S.T. also provides an indication of the co-regulation by significant others on those specific components. While the M.I.S.T. does not provide specific information on pain management, it offers valuable insights into transdiagnostic processes involved in pain transition, pain perception, and pain regulation, as well as on processes influencing comorbid emotional dysregulation.

By resisting the natural tendency to simplify the complexity of chronic pain and working strategically and systemically, you can multi-target during ReAttach processes, offering hope for achieving the best results.

ReAttach Sessions

As usual, in ReAttach training, we start by optimizing arousal, activating the mirror neuron system, activating sensory processing, and conducting social cognitive training to restore connectivity and promote neuroplasticity [25]. After optimizing learning conditions through social cognitive training, we begin with identifications as preparation for active learning via cognitive bias modification and associative memory formation [31]. Identification with the perceived nociplastic pain is crucial to retrain regulation and control by shifting the perceived nociplastic concept from an external threat into an internal negative affect, which the patient can regulate.

The chronic pain has now developed into a concept that covers a much larger area than the initially experienced nociceptive stimuli: the nociplastic pain is intertwined with the individual's comorbid emotional dysregulation and psychosocial problems. As a ReAttach Specialist or Affect Coach, when selecting a concept, it is crucial to zoom out as much as possible and discuss with the patient beforehand what you mean by this identification: you are referring to everything the concept relates to. If you specify, you cannot achieve the effectiveness you are aiming for, especially with nociplastic pain. The chronicity of nociplastic pain indicates that the patient has not been able to function optimally for a long time. It is important to retrain adaptive skills that support rehabilitation, movement, muscle building, healthy aging, participation, self-care, and caring for others. The identifications are directly linked to the cognitive bias modification that you will subsequently offer. Cognitive bias modification offers space for motor imagery: training the brain to perform physical exercises by associative memory formation. In this way, chronic pain patients can practice pain-free movement and expand their movement repertoire. Offering physical exercises immediately after the ReAttach session, either alone or in combination with mirror training, has yielded excellent results in the past and helped many patients improve. Further research into the combination of ReAttach, movement therapy, and mirror training in Parkinson's Disease is in its initial stage [32]. The role of identification with adaptive schemas and the New Mind Creation involves retraining the overactive amygdala to retrieve positive affect and adaptive schemas from secure attachment [26]. In complex symptomatology with overlap of nociceptive, nociplastic, and neuropathic pain, full ReAttach sessions including the New Mind Creation are essential to target the complexity of the symptom networks.

Neuropathic pain

Argoff (2024) emphasizes the prevalence of neuropathic pain following spinal cord injuries, multiple sclerosis, or post-stroke, and advocates for a personalized, multimodal approach to

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pain relief [33]. This tailored multimodal approach, highly resonating with ReAttach, is recommended as it addresses the overlapping nociceptive, nociplastic, and neuropathic pain, which is commonly seen in chronic pain patients with nerve damage after the initial treatment phase [33]. Chronic pain in the lower back area is an example of a potential pain condition in which nociceptive, neuropathic, and nociplastic pain coexist and require an individualized multimodal approach, such as ReAttach. Dysesthesia refers to unpleasant sensations of touch, for instance, a burn, prickling, or electric-shock sensation. The following case report illustrates the use of ReAttach in a post-stroke patient with persistent worsening dysesthesia.

A case-report of ReAttach and dysesthesia Before ReAttach

It has been seven years since James suffered a stroke. Although he has recovered, he continues to have disabling problems with his right arm. After the stroke, James experienced tingling in his right arm. In recent months, however, the symptoms have worsened, resulting in electric shocks that are also spreading. The extension of the area involved and the intensity point to a combination of neuropathy and nociplastic pain. Nowadays, James cannot stand warmth or heat on his fingertips, nor a drop of water on his arm. Both conditions will evoke electric shock feelings that are unbearable. Taking a shower is impossible, and his professional cleaning work is at stake. His neurologist tried to help with different treatment attempts, such as massage, ice, and transcutaneous electrical nerve stimulation (TENS), but the pain only got worse.

ReAttach

The ReAttach Affect Coach addressed the dysesthesia in two tailored ReAttach sessions, the first of which focused on restoring sensory integration and optimizing learning conditions. After a clear explanation and psychoeducation, the ReAttach Affect Coach used identification with the right arm and motor imagery to understand the functioning of the right arm. The second session involved the New Mind Creation Protocol, designed to work towards the New Mind Creation technique. New Mind Creation was used to encode nociceptive stimuli as safe, train the overactive amygdala to respond accordingly, and practice exploratory behavior with adaptive schemas as in secure attachment conditions.

After ReAttach

At the end of the second ReAttach session, the therapist asked James if he felt safe. When he answered yes, the therapist asked him to put little drops of warm water on his right hand. The dysesthesia had disappeared, and James even confidently placed the fingertips of his right hand in a cup of warm water. It has been three years now, and the dysesthesia has not returned.

Discussion

This study primarily focuses on chronic pain and highlights several potential benefits of understanding it as a multimodal biopsychosocial condition rather than just a physical issue. This broader perspective encourages the development of more comprehensive treatment strategies. Integrated approaches, such as ReAttach, can significantly improve quality of life by reducing functional impairment, enhancing self-management, and increasing social participation.

Personalized treatment, which is guided by assessing various pain mechanisms—nociceptive, neuropathic, and nociplastic—allows for more targeted interventions and decreases reliance on inefficient trial-and-error methods. Additionally, addressing comorbid conditions like anxiety, depression, and sleep disturbances is essential, as it provides critical psychological and emotional support, helping to break the cycle between chronic pain and emotional dysregulation. Strengthening patients' coping strategies and enhancing their social environments can also alleviate the burden on caregivers.

Notably, ReAttach is an accessible, non-invasive intervention that can be integrated into healthcare and workplace systems. ReAttach techniques such as W.A.R.A. and the Forgive and Forget Hood demonstrate promise in preventing acute pain from becoming chronic and in reducing hypersensitivity. The ReAttach Protocol for chronic pain provides insight into the possibilities of using ReAttach for the various manifestations of chronic pain: nociceptive pain, nociplastic pain, and neuropathic pain, as well as the overlapping variants. The examples given are promising, but further research is needed to investigate the full potential of ReAttach in chronic patients and to implement it in healthcare.

Beyond the individual advantages, effective chronic pain management can yield broader societal benefits, including reduced healthcare costs, lower absenteeism rates, improved workplace productivity, and greater social inclusion.

Limitations

This study faces some predictable limitations that need to be considered. The complexity of chronic pain, which can manifest in nociceptive, neuropathic, and nociplastic forms, along with frequent comorbidities, makes it challenging to standardize treatment approaches. Additionally, the underlying mechanisms—especially in nociplastic and central sensitization pain—are not yet fully understood, complicating the development of evidence-based interventions. Some proposed mechanisms, such as sensory processing imbalance and the effects of ReAttach, require more large-scale empirical validation. The subjective nature of pain, combined with variability in how patients perceive it, also creates difficulties in objectively measuring treatment outcomes.

Moreover, practical challenges exist in integrating ReAttach into healthcare and workplace systems, as this may involve logistical

issues, training requirements, and financial constraints. Although the protocol is designed as a transdiagnostic intervention, there is a risk of overgeneralization; not all patients may respond similarly due to biological or psychological differences.

Self-regulation techniques, such as W.A.R.A. and the Forgive and Forget Hood rely heavily on patient motivation, consistency, and awareness of pain signals, which may limit their effectiveness. Lastly, social and cultural barriers, including stigma, health inequities, and limited access to multidisciplinary care, may further restrict the reach and impact of these interventions across diverse populations.

Conclusion

The complexity of chronic pain with interfering comorbidities negatively affects pain management and necessitates a multimodal biopsychosocial treatment approach. We suggest the transdiagnostic, multimodal ReAttach, integrated within healthcare and workplace systems as an accessible, non-invasive treatment of chronic pain.

While ReAttach techniques are promising, further research is needed to fully explore ReAttach's potential in chronic pain patients and facilitate its broader implementation in healthcare.

Chronic pain is a complex condition that often comes with additional challenges, such as depression, anxiety, and sleep disturbances. These comorbidities make effective pain management difficult and highlight the necessity for a comprehensive treatment approach that considers biological, psychological, and social factors. Focusing solely on the physical aspects of chronic pain is not enough, as it also affects emotional well-being, social connections, and work performance.

The transdiagnostic, multimodal ReAttach protocol presents a promising solution. It is an accessible, non-invasive intervention that can be implemented not only within healthcare systems but also in workplace environments, where chronic pain significantly contributes to absenteeism and decreased productivity. By addressing the complex interactions between biological, emotional, and social factors, ReAttach promotes patient self-management and enhances support from the social environment. This approach can alleviate some burdens on caregivers and encourage social inclusion.

However, while the initial findings on ReAttach are encouraging, further rigorous research is essential to confirm its effectiveness across various populations with chronic pain. It is also important to clarify how it works and investigate long-term outcomes. Studies should examine how to implement this approach while overcoming potential barriers, such as training needs, healthcare disparities, and patient engagement issues. Ultimately, enhancing our understanding of ReAttach could lead to more personalized and integrated strategies that not only relieve chronic pain but also improve overall quality of life and reduce the societal and economic costs associated with this widespread issue.

Declaration of interest

Paula Zeestraten-Bartholomeus is the developer of ReAttach, the W.A.R.A. and Forgive and Forget Hood.

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