

Dance/USA

Task Force on Dancer Health

Pain Facts for Dancers

This paper addresses a complex topic designed for professional dancers experiencing persistent or chronic pain conditions. It is offered to guide dancers in discussing their condition with their physician or medical treatment team.

Every time you plié, do you have a pain in your knee that just never seems to go away? How about when you point your foot? Does something in your ankle just not feel right? Has this pain just become your new normal? This article may have the answers you have been looking for! This article breaks down the myths and facts of pain, giving you a better understanding of why you may be feeling what you are feeling inside and outside the dance studio. Not only that, this article will give you tips and tricks about how to combat your persistent pain, when to seek additional help, and who to seek additional help from.

What is pain? (International Association for the Study of Pain, 2020; Melzack, 2013)

- “An unpleasant sensory and emotional experience associated with, or resembling that associated with, actual or potential tissue damage.”
- “Pain is a personal, subjective experience that can be influenced by cultural learning, the meaning of the situation, attention, and other psychological variables.” (Melzack 2013)
- Pain acts like the body’s “alarm system” alerting us to danger or even *potential* danger, disease, or damage, from an input from the body or the environment.
 - All pain is real and is an output of the brain based on the brain’s perception of threat or danger
 - Pain can be very valuable as an “alarm system”
 - Example #1: Pain is good because it lets you know when to seek care for an injury
 - Having shin pain from “Shin Splints” lets you know to rest more and adapt your training/dance practice so that it does not progress into a more serious injury like a stress fracture
 - Early intervention can prevent the injury from worsening, improve healing, and reduce risk of complications like infection.
 - Example #2: Pain is good because it lets you know when there is the potential for damage, so you can avoid injury
 - Pulling your hand away from a hot pan or flame before getting burned

- Neuroplasticity is the nerve cells, nerve pathways, and the nervous system all together getting better at what it practices frequently
 - The nervous system is the body's "wired system" of communication—more pathways get created based on connections that "fire a lot"
 - "nerves that fire together wire together"
 - If the cells and systems "practice" protection 24 hours a day, they get better at protection (they get better at what they practice, even if that thing is pain!)
 - For example, a dancer could have ankle pain even when that area has healed if the cause of the pain was not addressed early and the pain lasted so long that the body got "good" at protecting that area
 - Pain should not be ignored. But, if the body injury source of pain is determined to be healed, then perhaps the body needs to rework its messaging through other treatments, such as physical therapy.
 - Nerves adapt by increasing their baseline level of "excitement" which makes the alarm system more "sensitive" – so, the nervous system may detect danger even when something is not dangerous (kind of like a "false alarm")
 - However, these changes are NOT permanent!

Why do we need to talk about pain?

- Dancers may frequently tolerate high levels of "discomfort," but it is important to be aware of the difference between pain and discomfort so that dancers can modify training and seek treatment early to prevent the worsening of a potential injury
- Approximately 1.5 billion people worldwide and 25 million adults in the U.S. suffer daily from chronic pain (Louw et al, 2016)
- 1 in 4 patients given an opioid prescription go on to chronic abuse (CDC, 2017)
 - This is a systemic problem due to many factors including
 - Many people wanting a "quick fix" for their pain
 - Doctors being more likely to prescribe opioid (and non-opioid) analgesics than refer patients to physical therapy
 - Why these systemic issues?
 - Potential factors include:
 - Inadequate professional training on pain management strategies
 - Medical systems set up with little or no interdisciplinary care
 - Poor knowledge of the risks and regulations for prescribing opioids by doctors

How do some people "explain" pain? Or how do we "understand" pain? (Moayedi, 2013)

Pain can be understood through the lens of two different models or frameworks: Biomedical model vs. Biopsychosocial Model

Biomedical Model (Moayedi, 2013)	Biopsychosocial Model (Linton & Shaw, 2011)
Bio-/Biological Focus: emphasizing a direct link between tissues (e.g., bones, skin, muscles) and a related injury or disease	Bio-: a person's anatomy and physiology, immune responses, "fight, flight, or freeze" response
Medical Model: greater injury/disease at the "tissue level" = more symptoms	Psycho-: - emotions/memories; - belief in a person's own capacity to change behaviors/thoughts/pain symptoms (called <i>self-efficacy</i>) - a person's idea of what causes their symptoms/pain, e.g., "Do I have control over this, or is something not within my control making this happen to me?"
	Social-: cultural factors, learning mechanisms, family and friend support, work responsibilities, socioeconomic factors
Biomedical Model Treatment Approach: Target treatments toward the primary tissue injury to get rid of the pain.	Biopsychosocial Model Treatment Approach: Comprehensively address each aspect that may be contributing to pain from each of the above categories (Bio, Psycho, Social) For example, utilizing the patient's support systems for activity modification and coping strategies to reduce stress response and pain output.

Theoretical Frameworks of Pain (Moayedi, 2013; Table adapted from the Revised Neurophysiology of Pain Questionnaire - Catley, 2013)

Pain <u>MYTHS</u>	Pain <u>FACTS</u>
Thinking that pain always means injury or tissue damage	Poor correlation between tissue damage and pain
Believing pain is felt because the "sensors" in tissues send signals to the brain	Pain experience is an output of various parts of the brain (multifactorial)

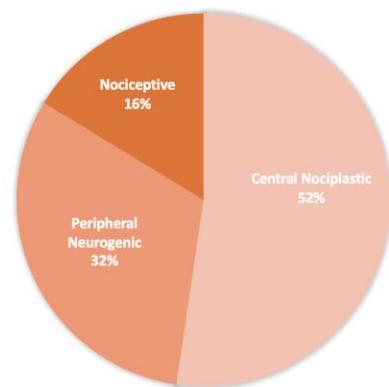
Any new or different pain sensation is related to a new injury	Pain can remain after tissues heal (Persistent pain does NOT mean that tissues have not healed properly, this is kind of like a “false alarm” from brain)
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Pain Mechanisms 101 (Smart et al., 2009, 2011) - see added citations in references (1 of 1, 1 of 2, 1 of 3 Smart Et al., 2012 papers on mechanisms)

There are many types of pain that can exist. To simplify this discussion a little bit, let's think of pain in three main categories. These categories can exist at the same time and change in how much or how little they contribute to what somebody feels as pain.

1. When pain is localized (in one spot or small area,) we think of this as a “tissue issue.” This is common with a new injury or early on in a healing injury. The technical term for this type of pain is: nociceptive pain.
2. When a nerve gets injured or irritated, we think of this as a “nerve injury issue” (e.g., the communication network itself, the “wired system” is injured). The technical term for this type of pain is: peripheral neuropathic pain.
3. When pain lasts way longer than it should, based on a timeline of predicting healing, a person's brain may be acting as a protector, and could send a “false alarm” signal of pain. The technical term is: nociceptive pain.

If we were to draw a picture of all these factors and how they contribute to the experience of pain, we might draw a pie chart (see below). Other factors that can contribute to the “pain pie” include mental health factors, sleep problems, job and social factors, negative thoughts, overall physical health, fear or emotional distress, and past experiences...those are a lot of things that could change a person's pain!



“Central sensitization” Facts (Nijls, 2016)

- When a person's body acts like an oversensitive alarm system, increasing sensitivity of feeling pain, or having an extreme response of pain to something that should not cause pain, like a “false alarm”
- Various related problems that could cause a change in (often increased) responsiveness to a sensation such as mechanical pressure, chemical signals in the body, light, sound, cold, heat, stress, and electricity. For example, bright lights are now uncomfortable affecting a dancer's ability to perform optimally on stage.
- Pain could be further activated by strong thoughts or emotions, such as overly worrying about pain (e.g., “catastrophizing”), fear, avoiding an activity/movement that a person thinks may cause pain, life stress, always being on the defensive or on alert, lack of

acceptance, depressive thoughts, and negative illness perceptions (for example, thinking the injury/pain was caused by another person and that is why pain is so bad).

- If a dancer has “central sensitization,” this could feel like low back pain that started in one area and then spread more generally to the whole lower back, and that persists with pliés and battements and worsens with adagio. It could also mean that movements that used to be pain-free are now painful and it does not take much stress or pressure to that area to cause pain.

Hypermobility, Pain, and Dance

- Dancers tend to be hypermobile (joints that can move beyond the normal range of motion due to overstretching and/or genetics)
- Hypermobility and pain
 - People who are hypermobile report 86% prevalence of chronic widespread pain, 71% endorsed recurrent gastrointestinal pain (Bettini et al., 2018)
 - Many of the chronic pain syndromes that are associated with joint hypermobility are related to your body’s alarm system being overly sensitive
- Hypermobility in combination with chronic injuries, high mental toughness, and resilience to push through pain can lead to overly sensitive alarm systems

Pain is inevitable, but suffering is optional!

- There are many reasons why your body’s alarm system could stay on or be overly sensitive
- Some of this may be because of the demands of dancing
- Some of this may be due to genetics (unfortunately, you cannot change this)
- The good news: all of this can be changed/improved except genetics. The pain you feel is NOT your fault!

Why do dancers’ alarm systems stay on?

- Dancers overstretch since youth to be able to hold their bodies and move in extreme, possibly unnatural positions which may lead to small amounts of damage to muscles and ligaments
- High training loads for dancers, in some cases, 20 hours per week or more, can lead to repetitive injuries with little recovery time to properly heal
- There is a psychological component: feeling like you need to be “perfect” in order to be good at dance
 - Possible indicators of perfectionism may include: out-of-proportion fear of failure, all-or-nothing thinking, defensiveness, being overly self critical, holding rigid beliefs or unattainably high expectations for performance, excessive need for control
 - Ways to overcome perfectionism may include: improving self awareness of self talk and expectations, focusing on successes, viewing mistakes as learning

- opportunities, setting more reasonable goals, learning how to receive critique, reducing self imposed performance pressure
- Bruce Marks once said at the barre, "Oh, I don't know if I can do this anymore." The teacher replied, "You can't stop now, you're just starting to get it!" It's like golf, people still play it every day but rarely perfect it, even Tiger Woods
- It has been shown that small amounts of damage to joints and chronic overuse injuries in hypermobile people may play a role in the development of overly sensitive alarm systems, which experience pain long after injuries typical healing time (Bettini et al., 2018)
- Dancers tend to have high mental toughness and resilience to dance through pain. However, ignoring pain could actually lead to MORE pain and an overly sensitive alarm system (Claus et al., 2017)
- The good news is that dancers often have strong focus and excellent mental attention, so they are more likely to engage in positive steps to reduce pain, such as breathing and meditation practices. Plus, these attributes are incredible life qualities that help dancers excel no matter where they go or what life role (mom, executive, etc.) they take on next.

How do you know if your alarm systems are overly sensitive? (Smart et al., 2012)

Do you have:

- Widespread pain
- Fatigue/poor sleep
- Headaches
- Anxiety/depression
- Poor memory or concentration
- Sensitivities to light, odors, or sounds

The factors above could increase the "sensitivity" of the alarm system, and all of these factors are symptoms of overtraining.

What is the outcome of alarm systems being "overly sensitive"?

- Interference with a dancer's ability to dance and function to their full potential in their everyday life
- Increased injury risk due to fatigue and decreased energy
- Lower threshold of tolerance to activity/loading/exercise/etc.

How do you decrease the volume of pain?

- Change beliefs to change pain experiences and behavior ("hurt does not equal harm")
- Think about factors other than just tissue injury and its relation to persistent pain, try to reduce fear
- Teach individuals that the nervous system has the ability to decrease its sensitivity ("positive neuroplasticity!"), leading to increased confidence and improved dance performance

Research has shown that people receiving education on the science of pain may have:

- Improved pain knowledge
- Increased function and reduced disability (short-term)
- Decreased pain ratings (short-term)
- Reduced sensitivity of the alarm system (long-term)
- Increases in physical movement

Education is not enough to help dancers cope and quiet the alarm of the nervous system

- Training changes can help:
 - Prioritizing strength and conditioning training
 - Adequate rest between training sessions
 - Healthy diet and adequate water consumption
 - Healthy sleep schedule
- Mental strategies can help:
 - Relaxation/stress management techniques
 - Mental health treatment/support

When should you seek help?

- When you have injured yourself and the injury is not resolving or improving in a few days
 - For example: you have tried the RICE (rest, ice, compression, and elevation) strategy on a recently sprained ankle but you still have residual swelling and it is still painful to point your foot a couple of days post-injury
- When you have a history of chronic repetitive injuries
 - For example, a pain in your hip that just does not seem to go away or comes back occasionally during heavy training periods

It is a good idea to start gathering a healthcare team in advance of increased dancing hours!

Who should be a part of the healthcare team?

- Physical therapists
- Massage therapists
- Athletic trainers
- Acupuncturists
- Osteopaths
- Psychological counselors
- Medical doctors

The goal of providing you with this information is to give you the confidence to know if and when you need to ask for help. Education on pain is the first step toward successful symptom relief and improved function to keep you in class, on stage, and feeling 100%. No matter your

future plans in dance, (1) understanding that your pain can affect both your mind and body, and (2) having the tools to listen to your body each day, assess what you are feeling, and express your needs is important for a long, healthy career (and life). Also, open communication with your coaches, physical therapists, and other healthcare providers will create a positive outcome for all involved. Your pain is real and it matters!

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Disclaimer: The information on pain contained in this paper is intended to help guide and inform the dancer. It is not meant to take the place of the advice of a medical professional. This information is provided by Dance/USA Task Force on Dancer Health.

Written by: Mandy Blackmon, PT, DPT, OCS, CMTPT, Savannah Hood, PT, DPT, Leda McDaniel, PT, DPT, OCS, and Anastasia Thue, PT, DPT (2024)