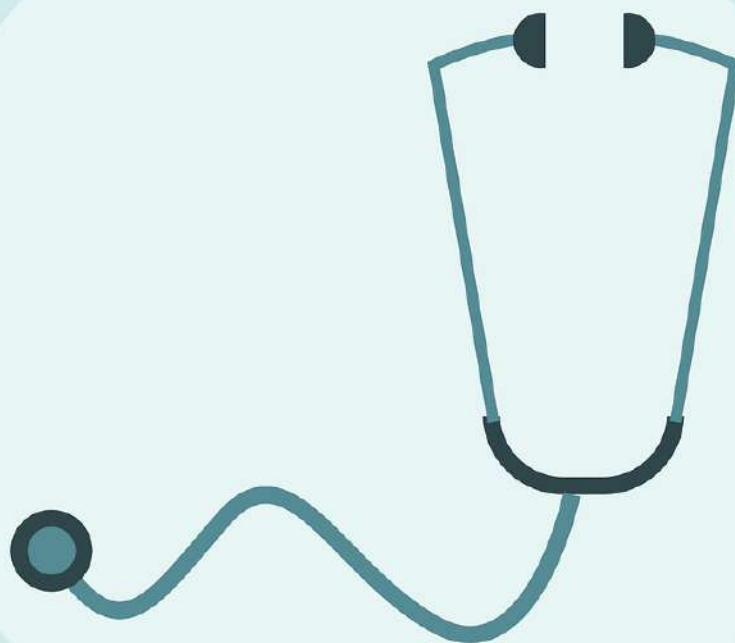


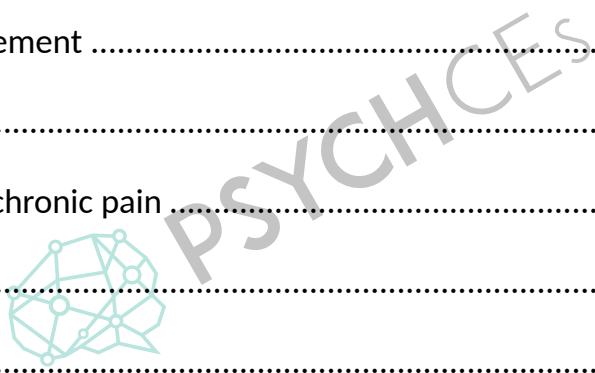


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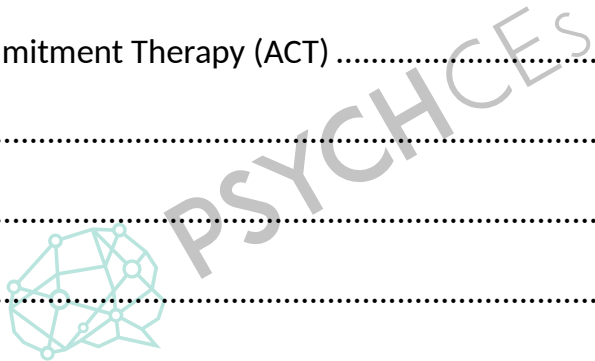
Alternative Approaches to Pain Management



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Introduction

Chronic pain is one of the most common conditions experienced in the world. According to the Centers for Disease Control (2020), in 2016 approximately 50 million adults reported chronic pain. This number amounts to 1 in 5 individuals suffering. Additionally, 20 million adults, or 8%, reported extreme chronic pain. The severity of these numbers shows not only how common chronic pain is but how necessary having resources to support patients with chronic pain is. While there are a variety of pharmaceutical options for managing chronic pain, there are often downfalls with using medication to manage pain.

Section 1: What is chronic pain?

It is essential to understand the difference between acute and chronic pain to learn about ways to manage or treat the pain. Chronic pain is characterized by having lasted more than several months and often persists even after treatment or healing of a disease or disorder (Cleveland Clinic, 2020). Individuals with chronic pain often experience significant physical and emotional limitations as a result of the pain. For example, they may be unable to work and this impacts their income or they may be unable to engage in sexual activity and this impacts their relationship. They often report higher instances of anxiety and depression as well.

Chronic pain is different from acute pain, which is generally sudden and linked to something specific in nature such as an injury or illness. It can be treated and the pain will subside. For example, once a broken bone is healed it should no longer cause pain, whereas a person with arthritis will always experience joint pain.

What causes chronic pain?

Chronic pain is caused by a variety of conditions and occasionally cannot be linked to a disorder or condition at all. Chronic pain is often caused by cancer, stroke, fibromyalgia, chronic fatigue, autoimmune issues, endometriosis, bowel disease, and other conditions (Columbia University, 2020). It also appears that chronic pain is linked to psychological conditions such as stress and trauma. The nervous system responds abnormally for individuals with stress and trauma compared to those with less of these issues. This can explain why some individuals with more trauma or chaos in their lives experience pain differently.

Chronic pain will produce different symptoms depending on the individual, however, most patients report some or all of the following: low back pain, headaches, joint pain, muscle aches, burning sensations throughout the body, tingling sensations throughout the body, and shooting pain.

Because chronic pain is often so intense and consistent, it often has negative mental health impacts for patients who experience it.

Impacts of chronic pain

Chronic pain has significant impacts for patients across all life domains. Patients with chronic pain report higher levels of fear, anxiety, depression, sleep issues and need for coping skills (Duenas, Ojeda, Salazar, Mico, & Falide, 2016). They report disruptions in their work, family, and social networks. They often experience physical health issues such as injuries, traumas, infection, illness, cancer, and nerve damage. All of these experiences often lead to the inability to physically function in day-to-day life, increased mental health issues, and overall poor family functioning.

Chronic pain often prevents patients from being able to engage in necessary daily activities such as physical exercise, completing chores, attending social activities, and being as independent as possible. These struggles often lead to a reduced quality of life because social experiences are lacking or nonexistent and patients might feel shame or sadness about what they are unable to do rather than celebrating what they feel they can do. It appears that the more significant the chronic pain, the lower the quality of life is according to the Duenas, et al. (2016) study.

Patients with pain also report sleep issues that reduce the quality of life. Lack of sleep or interrupted sleep causes a reduction in task completion and cognitive functioning. This impacts all aspects of life, including relationships and employment. Many patients who have chronic pain also report that their pain is worsened the day after poor sleep and that a higher pain day is often followed by a poor sleep night. The relationship between pain and sleep is an important relationship between clinicians and medical professionals to understand. It should be a focus of treatment for all chronic pain patients.

Chronic pain also has significant impacts on the workplace. Patients with chronic pain issues often have higher levels of absenteeism and often have to change their duties or tasks. This can lead to loss of employment. For patients who do not take time off work, there is a higher likelihood of reduced work performance and productivity. This is increased when pain is increased. Often patients with chronic pain will retire early or go on disability as related to their inability to work.

One of the most profound impacts of pain, however, is the impact that chronic pain has on social and interpersonal relationships. Up to half of the patients in the Duenas, et al. (2016) study had missed social events and gatherings as related to pain. This limits a person's ability to be fully present in relationships and it can often cause resentment from partners and friends of the patients. Patients with chronic pain often report higher levels of stress in family dynamics because of the social limitations being experienced. Additionally, disability and pain can cause dependency on behalf of the patients toward their peers and family members because of their inability to independently complete tasks. This causes feelings of sadness, burden, and frustration. 23% of patients report low satisfaction with their family life and 59% report difficulties in their relationship with their partner (Duenas, et al., 2016).

Chronic pain medication

Many patients who have chronic pain are often prescribed opioids and other medications for managing pain. While some people may find relief, there are many consequences of taking prescription medication for pain management, and often once individuals are prescribed medication they may be unwilling to try non-pharmaceutical options for pain management and relief. Some of these consequences of pharmaceutical options for pain management include the following:

- Misuse of prescribing by medical professionals for monetary compensation (Center for Alcohol and Drug Studies, 2020)
- High likelihood of becoming addicted to medication
- Possibility of transitioning to illegal substances such as heroin after using opioids
- Likelihood of overdose and potentially death
- Lack of actual treatment and more managing of symptoms (Center for Alcohol and Drug Studies, 2020)

Alternatives to opioids include the following: Tylenol, anti-inflammatory medications, nerve pain medications, antidepressants, and medicated creams and topicals (Florida Health, 2019). It is important to note, however, that even these drugs can be misused. Individuals with chronic pain must explore drug-free approaches to managing their pain.

Case study 1

Joshua is a 29-year-old man who injured himself at work several years ago. He fell from a second story building and fractured his back. He was able to recover most of his functional abilities but has chronic pain that the doctors report he will have for the remainder of his life. Joshua was initially lacking the motivation to improve his health status. He was depressed, anxious, and angry. He was especially angry with his employer, who he felt should have better protected him. Joshua had dreams of being a husband and parent and he felt as though his dreams to do so were crushed after the accident. While this can be reframed in therapy, Joshua has yet to seek mental health services, despite the accident having been several years ago.

Joshua's current struggle is that he was prescribed pain medication several years ago for the acute pain from the accident and continued to take it. Joshua now buys illegal prescription drugs to manage his chronic pain and dependency on narcotics. He is struggling to maintain his primary relationships because of being high around family and friends who are otherwise uninterested in spending time around him when he is not sober.

Joshua's family has requested that he attend a Narcotics Anonymous meeting or other drug treatment program that focuses on patients who have chronic pain. He was initially reluctant to attend drug rehabilitation treatment but is beginning to feel that it is more and more necessary for him to live a full and happy life because he feels the dependency impacting most areas of his life. He also notices that his body does not respond to the pain medication the way it did several years ago and that he still has chronic pain in his back.

Joshua finally decides to attend a drug-treatment outpatient program after several months of discussing it with his family members. After just a few months he is beginning to feel more and more like his pre-accident self where mental health is concerned. He recently began attending physical therapy again and is having less and less pain.

Joshua's case is a good example of a common path that many individuals inadvertently take after a traumatic accident: prescription and addiction to pain medication.

Summary

Chronic pain affects a large subset of the population and negatively impacts lives. People who have chronic pain are more likely to struggle with mental health issues, experience an inability to remain employed, and face interpersonal relationship issues, substance

use, and other difficulties. Because of these negative outcomes, there must be appropriate methods for managing chronic pain. Utilizing pain medication is not a sustainable long-term solution because of the negative impacts that addiction can have. Additionally, patients who utilize narcotics for managing pain are often not relying on other adaptive strategies for pain control. Drug-free pain management is a vital component of reducing chronic pain.

Section 2: Drug-free pain management

Introduction

While it seems many people are utilizing medication for managing chronic pain, at least 78% of chronic pain patients report wanting to try other methods to managing and reducing pain before utilizing medication (Gallup Inc., 2017). This number could be high because of how widely documented the opioid epidemic has become. Since 2015, 22,000 people have died as related to prescription opioids. This number has quadrupled since 1999 and has been given attention in the media, research studies, and in prevention programs nationally (Gallup Inc., 2017).

Because these numbers are so significant and the impact of substance use is wide-ranging, it is assumed that drug-free management approaches to chronic pain are more sustainable and appropriate. The following strategies help manage chronic pain: yoga, physical therapy, physiotherapy, osteopathic medicine, acupuncture, diet changes, hyperbaric oxygen therapy, massage therapy, chiropractic care, meditation, Cognitive Behavioral Therapy, Acceptance and Commitment Therapy, hydrotherapy, and tai chi.

Yoga for pain management

Yoga is a tool that many individuals use for coping with a variety of conditions, including physical and mental illnesses. Harvard (2020) finds that yoga is a mind-body practice helpful for managing pain. It includes controlled breathing, stretching and strengthening muscles, and meditating.

Yoga is found to be helpful for people with fibromyalgia, back pain, migraines, and other conditions. Patients who attend a weekly yoga class report increased mobility. Yoga is also incredibly helpful for mood and psychosocial health and wellness.

Yoga for pain management generally includes 45-90 minutes of dynamic movements and stretching. They initially start with breathing exercises and releasing the mind of

distractions and worrying. From there, patients will go through a variety of seated, standing, and prone postures. Each posture is generally held for at least one minute. What is wonderful about yoga for chronic pain patients is that all yoga moves can be modified to be seated or require less movement. This supports all individuals based on their health, strength, and experience (Harvard Health, 2020).

Most individuals with chronic pain can attend their local gym or yoga studio and find classes that are consistent with their needs. They can also utilize YouTube and other online resources to find appropriate, professional-led classes.

Yoga induces relaxation in the body and mind. That relaxation is found to provide some healing properties for chronic pain (Yoga International, 2020). It turns off the stress response of the body and directs the body towards growth, repair, immune functioning, digestion, and other self-care processes. When patients are moving their body in a way that causes discomfort or pain, they can go through the following steps:

1. Direct the breath to the discomfort or pain through visualization – imagine the breath healing the body and releasing the tension
2. Breathe into another area and switch back and forth between the painful area and the area that is not painful
3. Hold a restorative, still pose for at least ten minutes to experience the reduction of tension. Examples of restorative poses include the nesting pose, supported bound angle pose, supported backbend pose, and the supported forward bend (Yoga International, 2020)

Yoga helps promote a reduction in pain by the following:

- Reducing stress (Beaumont Health, 2020)
- Improving mobility and general functioning
- Preventing joint breakdown
- Preventing cartilage damage
- Protecting the spine and improving posture
- Improving mood
- Increasing psychosocial wellbeing

- Improving strength
- Promoting relaxation
- Increasing energy
- Increasing metabolism
- Managing weight

The following poses are specific to the type of pain:

- **Back pain:** cat pose, dolphin plank pose, cow pose, cobra pose, and downward-facing dog pose
- **Shoulder pain:** bow pose, eagle pose, cat pose, dolphin pose, half-moon pose, and plow pose
- **Knee pain:** big toe pose, bound angle pose, bridge pose, and extended triangle pose
- **Hip pain:** bharadvaja's pose, boat pose, big toe pose, child's pose, cat pose, and easy pose (Beaumont Health, 2020)

Case study 1

Phyllis is a 49-year-old woman who has had chronic migraines for most of her life. Every few months she will have a week or two of constant migraines that are debilitating to her. She is unable to work and can hardly move about her home during this time. Phyllis has been historically very frustrated with the medical system because nobody has been able to properly offer her an explanation for the headaches. She has done a variety of treatments to attempt to reduce them but has not had spectacular luck.

Recently Phyllis was talking with a friend about her migraines. She became emotional when she mentioned how difficult it is to be incapacitated for that week or two every few months. Her friend suggested that she might try yoga when she feels the headaches coming on before they have turned into migraines. Phyllis was reluctant at first but also is willing to try anything to have a better quality of life.

For the past six months, Phyllis has been attending her local yoga studio several days per week. She attends a yoga class that is specific to chronic pain patients. When she is noticing that she may feel a migraine "attack", as she calls it, Phyllis will transition to home-based yoga. She reports that while yoga does not take away her migraines, she

feels generally more in control of her pain than she has previously felt. Phyllis states that yoga has given her a better understanding of her body. She feels more connected to her body and is listening to it and understanding it more. She states that she now feels as though she can understand when the migraines are coming on and have a clearer plan for how to transition to home-based self-care for a few days to manage them.

Phyllis also has such gratitude for the community of chronic pain patients that she has met at her local yoga studio. She reports feeling less alone, better connected to herself and others, and enjoying moving her body through yoga. She states: “it isn’t a quick fix but it has certainly helped me control my pain.”

Phyllis’s case study is a good example of how adding yoga into a patient’s lifestyle can be beneficial for the patient’s relationship to his or her body and to pain.

Physical therapy for chronic pain

Physical therapy is a service commonly offered for patients who have chronic pain and it is one that extends beyond stretching and exercise. Physical therapists assess patients from a holistic perspective (Advanced Physical Therapy, 2020). They provide manual therapy, stress management strategies, modify activity, and offer neuroscience education to the patients. Patients use physical therapy to understand and manage their pain better (Advanced Physical Therapy, 2020).

The following are common treatments provided by physical therapists to treat pain:

- **Exercise** – this is the main tool used in physical therapy for the treatment of chronic pain (Sears, 2020) Exercise is considered a feedback loop where the brain receives information from the body, and exercise is the output. When the body can move without as much pain as before beginning treatment, you reinforce to the body that movement will not hurt, therefore increasing strength and resilience. This treats the body and trains the nervous system to feel less pain.
- **Ultrasound** – the use of deep heating the body is helpful in physical therapy. The ultrasound will improve circulation and blood flow and is commonly used for treatment by professionals.
- **TENS units** – transcutaneous electrical nerve stimulation uses electricity to decrease the pain signals being sent to the body from the brain
- **Massage** – massaging the body can reduce stress and decrease pain by promoting blood flow and reducing tension and tightness

- **Dry needling** – dry needling involves using small needles to pierce muscle tissues and knots. It has been found to reduce the pain in these areas and while it isn't used by all physical therapists, many do use this newer treatment
- **Heat and ice** – transitioning between heat and ice helps to reduce inflammation that often causes pain
- **Neuroscience education** – teaching patients about why they are experiencing pain helps empower them to control their treatment and understand their bodies. Physical therapists will often teach patients about why they have pain, how they can expect their pain to behave, and how to control and reduce pain if possible. Physical therapists may work with patients to improve their range of motion, posture, strength, balance, and endurance (Sears, 2018).
Physiotherapists use a more hands-on approach to pain management through manual therapy. They provide stretching, mobilizing of the joints, and releasing of the soft tissues to reduce pain.

Case study 2

Jessica is a 52-year-old woman who was recently in a car accident. She reports that she fractured both her ankle and leg on her right side. Jessica was able to have surgery to fix the fractures and have screws put in place. She had never experienced surgery or pain before the car accident. Jessica now reports daily pain during walking and even more during exercise.

Before the accident, Jessica was a very active person. She walked daily and enjoyed riding her bike and going for long hikes in the mountains near her home. Jessica is single and has never had children but considers her dogs her children. It has been extremely difficult for her to not be able to hike with her dogs on the weekends and take them on walks in the evenings. Jessica is approximately four months post-op and wants to resume her normal life as soon as possible. She recently started attending physical therapy and has been approved to exercise again.

In physical therapy, Jessica has begun learning about new exercises to strengthen her ankle and leg. She is using resistance bands and beginning to be able to roll and stretch her ankle and leg without as much pain as previously. She has chronic aches every day that are mostly in the morning and evening. While she isn't experiencing sharp or shooting pain any longer, she is struggling with feeling stiff and dull, and with aching pain.

Jessica's physical therapist is working with her surgeon to develop an appropriate treatment plan. They both believe that water therapy will be beneficial to her ability to move and strengthen again without the impact of body weight on her joints. Jessica is of average weight but her joints and bones are still fragile and sensitive.

Within a few months of regular physical therapy and water therapy, Jessica and her dogs are walking together again on a regular, flat path in her town. She does not expect to be able to hike for several months still and anticipates she will always have chronic pain on her right side but she feels she can manage this by continuing to attend physical therapy, water therapy, and use heating pads for pain and ice for inflammation. Jessica's quality of life returns close to her baseline before surgery within a few years.

Physiotherapy

Many people assume that physical therapy and physiotherapy are the same, however, physiotherapy is an equally necessary drug-free intervention where chronic pain is concerned as physical therapy is. The difference between physical therapy and physiotherapy is that physical therapists generally rely on exercise-based strategies for pain management (Don Valley Health and Wellness, 2020).

Physiotherapists generally treat the following issues:

- Neck and back problems (College of Physiotherapists of Ontario, 2019)
- Issues in the bones, joints, muscles, and ligaments – often caused by arthritis or amputation
- Lung problems
- Disability as related to heart issues
- Pelvis issues – often caused by childbirth
- Mobility issues – often caused by trauma to the brain or spine, Parkinson's disease, or multiple sclerosis
- Fatigue, pain, swelling, stiffness, and a loss of muscle strength – often caused during cancer treatment or palliative care

Patients who access physiotherapy can expect the following:

- The physiotherapist will complete an assessment of the patient's condition and provide a diagnosis if necessary

- They will review the patients' medical history
- The physiotherapist and the patient will develop a treatment plan including exercises, assistive devices, and manual treatment provided (College of Physiotherapists of Ontario, 2019)

Studies done on physiotherapy have found that it greatly reduces pain, improves the quality of life, supports physical functioning, and even improves mental health by reducing depressive symptoms (Robinson, McIntosh, Peberdy, Wishart, Brown, Pope, & Kumar, 2019). Research showing the decrease in depressive symptoms is especially important because patients with chronic pain are more likely to struggle with mental health issues and even suicidal ideation. Therefore, the reduction of those symptoms is a significant finding supporting the use of physiotherapy for patients with chronic pain.

Physiotherapy is most often used in clinical or hospital settings and frequently a post-operative intervention for reducing pain. Up to 50% of post-operative patients will experience pain and up to 10% will experience severe pain. Research finds that patients who have higher stress levels, anxiety, and depression are more likely to experience post-operative pain because of the dysregulation of the immune system that causes inflammation. Post-operative pain is often neuropathic and inflammatory, which physiotherapy responds well to (Robinson, et al., 2019).

Case study 3

Kaylee is a 30-year-old woman who has had migraines her entire life. She has struggled to cope with the migraines and has had to have a shunt put in to drain spinal fluid that causes pressure to be unbearable. Every few years Kaylee has to have her shunt readjusted to best support her current level of health.

Kaylee has chronic anxiety and depression in combination with pain. She is not able to work or actively parent her children because of the impacts of the migraines that cause body aches, nausea, and blurred vision. She no longer drives because of these symptoms. Kaylee's husband and family are supportive and able to help her parent and she is grateful for the support. She does not know how she would be able to manage her life without their support when her pain is so severe.

Recently Kaylee had to undergo another brain surgery to have the shunt adjusted. She has been having more migraines and body pain lately. She has a diagnosis of fibromyalgia and has never felt that she's been able to manage her symptoms well.

Kaylee is staying at the hospital for several days after surgery to rehabilitate and then will transition to a postoperative acute care facility for more support.

While in the hospital Kaylee's surgeon refers her to physiotherapy. The physiotherapist's goal is to enhance Kaylee's quality of life. It may be that she continues to live with such severe pain but the physiotherapist believes that she can be less impacted by the pain. The physiotherapist begins to work with Kaylee on environmental factors that cause pain as well as helps her to identify several assistive devices that can support a reduction in her migraines. This includes different lighting in her home as she is especially sensitive to light as well as noise-canceling headphones as noise can promote severe migraines.

The physiotherapist also refers Kaylee to an outpatient mental health program for chronic pain. Kaylee is reluctant at first and slightly offended. She states: "This isn't in my head. I'm not making this up." The physiotherapist explains to Kaylee that he does not believe that she is making up the pain. He acknowledges that it's terrible that she experiences such pain and knows that it is significantly impacting her life. He validates for Kaylee that he sees the negative impact on her mental health that this pain is causing and he does not want her to also have to live with the emotional turmoil being experienced. He explains that this is why he wants to refer her to mental health.

Kaylee appears to understand this. For the next several months she continues to attend physiotherapy even after she discharges to home. She also begins individual and group therapy. Her therapy sessions focus on accepting her chronic pain and identifying ways to actively be involved in parenting because this is important to her. She simply hasn't known how to do this with the pain she's experiencing. In group therapy, she learns from other patients with chronic pain about how they accept their health status and continue to live full lives despite pain and frustration. Eventually, Kaylee begins to notice that her mental health status is greatly improved and her physical pain, while still present every day, is impacting her less and less.

After one year of physiotherapy and mental health therapy, Kaylee's children report the following: "Mommy is more present and that makes us feel loved." Kaylee's family is having to support her with parenting less and less. She feels overall that her quality of life has improved and she feels more confident in herself and her relationship with her pain.

Kaylee's case is a good example of how multiple drug-free approaches can be extremely helpful when used in combination with one another.

Osteopathic medicine

Osteopathic medicine is similar to primary care. An Osteopathic doctor will have attended an undergraduate pre-medicine program, a four-year medical program, and undergo the licensing process (Practical Pain Management, 2020). Osteopathic medicine, however, prides itself on the holistic approach to care that it offers patients. Professionals will utilize osteopathic practices and principles in their approach.

There are four tenets of osteopathic medicines. They are as follows:

1. The body is a unit and therefore the person is a unit of the body, mind, and spirit – the osteopathic doctor will treat all three and will not simply focus on the body in isolation
2. The body can self-regulate, self-heal, and maintain itself
3. The structure and function of a body are interrelated and reciprocal
4. The treatment of the body is based on the understanding of body unity, its ability to self-regulate, and the relationship between structure and function

Patients seeking osteopathic medicine can expect the following:

- The provider will perform a standard history assessment
- The provider will complete a physical examination
- The provider will perform an osteopathic structural examination in order to identify any impaired or altered musculoskeletal functioning – this includes the bones, joints, muscles, fascia, and their neural structures – this is called somatic dysfunction when identified
- A focus will be on the gait and postural alignment of the body – this offers insight into any chronic stressors and strains

Hands-on pressure or force is applied to somatic dysfunction in the body with the goal of correcting, removing, or improving the dysfunction – this should promote the self-healing properties that the body has to utilize

Common osteopathic techniques include:

- Direct thrusting of the muscles

- Muscle energy-releasing
- Myofascial release
- Counter-strain techniques

Research finds the following benefits to osteopathic medicine:

- Less unnecessary images taken
- Less pain medication is taken
- Less time in physical therapy
- Fewer referrals to other providers
- Fewer medical costs associated with treating pain (Practical Pain Management, 2020)

Case study 4

Juan is a 67-year-old man with Cerebral Palsy who has had chronic pain for most of his life. He is actively involved in his local gym and exercises from his wheelchair every day. He enjoys lifting weights and attends water exercise classes. Recently he has been having more and more aches and shooting pain in the middle of the night. He is struggling with how to control the pain. He saw his primary care doctor who suggested he work with an osteopathic medical doctor. Juan was hesitant at first but decided it was worth a try because his pain has been increasing and he wants to remain as active as possible for as long as he can.

The first thing that Juan's new osteopathic medical doctor does is complete a full assessment of his posture and alignment. Juan's new doctor realizes that his wheelchair could be better positioned for him. Together they adjust the wheelchair many different times and eventually find a position that is more supportive of Juan's alignment. It takes him a few weeks to get used to but he reports less shooting pain in the middle of the night after doing so. Additionally, his new doctor begins using manual techniques, similar to massage but not lasting as long as a massage would, to release the tension from his muscles that the Cerebral Palsy naturally causes. Juan's new doctor suggests this kind of manual tension release be a service that he receives weekly as he ages. Juan is again reluctant at first because this seems to be a big commitment but he again decides it is in the best interests of his health to follow through.

After a few months of having new positions in his wheelchair, receiving manual therapy, and learning additional drug-free strategies such as mindfulness and meditation, Juan reports having much less pain than before. He is appreciative of the referral to the osteopathic medical doctor and reports that he wants to continue to receive this kind of holistic treatment for the rest of his life.

Juan's case is a good example of how small things such as adjustments to mobility devices and muscle tension release can be crucial for the improvement of health.

Acupuncture

Acupuncture is traditional medicine in Chinese culture that is used for healing (Lagatree, 2020). Acupuncture is 3,500 years older than traditional western medicine. It is the process of applying needles to pressure points as well as administering heat to target specific areas of the body that are in pain. The needles help to release pressure and energy, known as qi, that the body is holding. Acupuncture assumes that the blockages or imbalances are released through these needles and from releasing pressure.

Acupuncture appears to be incredibly helpful for chronic back and neck pain, osteoarthritis, knee pain, and headaches. Individuals who receive acupuncture also report better sleep, increased energy, mental clarity, better digestion, and reduced stress (Lagatree, 2020).

Acupuncture is most commonly used to reduce pain caused by chemotherapy, dental pain, headaches, labor pain, back pain, neck pain, menstrual cramps, respiratory issues, and osteoarthritis (WebMD, 2020).

Patients should expect the following during acupuncture:

- Mild discomfort when needles are inserted
- 60-minute treatments initially
- One to two treatments per week and the number of weeks of treatment will depend on the condition/disorder
- Professionals may move or twirl the needles during placement
- Heat or electrical pulsing may be added during treatment
- Needles will remain in place for generally 10-20 minutes
- There is generally no discomfort when the needles are removed

- An individual should see a reduction in pain within a few weeks of treatment
- Acupuncture should be used in combination with other comprehensive treatments (WebMD, 2020)

Case study 5

Sheri is a 57-year-old woman with Rheumatoid Arthritis. She has been diagnosed for ten years and struggles to function. Her activity is limited to walking because of the severe pain that anything more intense causes her. She struggles to walk some days despite being on many different anti-inflammatory medications and other regimented plans for pain.

Sheri recently had a stroke, likely because of the reduced immune functioning that her diagnosis causes. After the stroke, she reports having more and more pain and feels as though she is at a loss for what to do. Sheri does not want to take narcotic pain medication because of a longstanding family history of substance use and abuse. She fears that she would not be able to control her use of medication and she knows that this would not be helpful for her health anyway.

Sheri decided to try acupuncture after having healed from the stroke and with approval by her medical team. She attends her first acupuncture appointment and despite being anxious, finds that it was quite relaxing. She chooses to attend acupuncture weekly for several months. The provider puts the needles throughout her entire body where she experiences the most pain. At times they focus on her large joints such as her hips. Other times they focus on her hands and feet because she struggles with dexterity. After several months Sheri notices that she has less pain. She has some pain daily and still struggles to function independently but she is having less constant pain and for this, she is very grateful because the pain has negatively impacted all aspects of her life.

After one year of weekly acupuncture, Sheri feels she can discontinue weekly services and go in for bi-weekly sessions. When she has flare-ups or more pain, she will schedule a weekly appointment.

Sheri's case is a good example of how patients with chronic health issues can utilize acupuncture to reduce stress and support a reduction in pain.

Diet changes for chronic pain

Pain is often the result of chronic inflammation, where the body sends white blood cells to an area to protect tissue (Harvard Health Publishing, 2017). Often in chronic illnesses,

such as an autoimmune disorder, the body sends the cells to otherwise healthy tissues, therefore causing inflammation. The body becomes inflamed to protect itself against harm (Harvard Health Publishing, 2017). One of the ways the body can reduce inflammation is through diet. Some foods are more helpful than others where inflammation is concerned.

Many individuals put little thought into their diet when they experience chronic pain. This is common because their pain may impact their life so significantly that something such as preparing meals becomes of little thought, however, this is maladaptive to the pain management process. Diet must be a significant consideration for the treatment planning process for chronic pain patients. Diet impacts the immune systems by activating it and deactivating it (Harvard Health Publishing, 2018). A poor diet can cause inflammation because the immune system receives data from food as an infection or bacteria. Deficiencies in vitamins such as zinc, selenium, iron, folic acid, and vitamins A, B, C, and E, have been studied with findings suggesting that immune system functioning is reduced.

Many patients with inflammation are advised to follow the Mediterranean diet, which includes foods that are high in antioxidants. These antioxidants soothe and reduce the likelihood of chronic pain flare-ups. Examples of these foods include fruits, leafy vegetables, nuts, legumes, and whole grains. Other research finds that foods high in fatty acids reduce inflammation. Examples of these foods include olive oil, flaxseed oil, and fatty fish.

Individuals who have high bouts of inflammation may be eating a diet high in foods containing simple sugars and refined carbohydrates. These foods often promote inflammation and attack the body. Examples include soda, processed meats, white bread, white pasta, and prepackaged foods.

Harvard suggests for meals that look like this:

- Half of the plate filled with whole grains and proteins
- Half of the plate filled with vegetables and fruit
- Use healthy oils instead of butter and flavorings (Harvard Health Publishing, 2018)

Jones (2019) identifies the following foods that should be in the diet of chronic pain patients in more depth:

- Beans, nuts, seeds, and all plant foods that have a pod: black beans, kidney beans, garbanzos, white beans, hummus, nuts, and seeds. Nuts should include walnuts, almonds, pecans, and peanuts. Seeds should include sunflower seeds, pumpkin seeds, and pine nuts. Peas and soybeans should be included. Finally, sugar snap peas, soy nuts, edamame, and any kind of tofu
- Fruits: berries, pomegranates, and cherries. Dark-colored fruits. Patients should avoid fruit juice because of the high amount of sugar that often makes inflammation worse
- Vegetables: yellow, orange, and red peppers are helpful as well as tomatoes. Spinach, chard, kale, leafy lettuce, romaine lettuce, arugula, and mixed greens. Purple and green cabbage, onions, garlic, broccoli, and Brussel sprouts as well as cauliflower. Finally, radishes, cucumbers, green beans, and green onions
- Fish: fish that lived in cold water should be preferred. These include salmon, herring, anchovies, sardines, and mackerel. It is suggested to only eat wild salmon
- Chicken, turkey, and other birds: eating white meat from these animals is preferred over dark meat. It should be consumed baked and not fried
- Dairy: low-fat or skim milk is preferred. Yogurt and natural cheeses and helpful
- Herbs: cinnamon, ginger, turmeric, garlic, rosemary, cayenne pepper, and black pepper
- Tea: black tea, green tea, white tea, and herbal tea
- Chocolate: dark chocolate with 70% higher cocoa is preferred

He also goes in further depth on the foods to avoid:

- Red meats such as beef, steaks, ribs, and sandwiches
- Processed meats such as ham, bacon, sausage, and lunch meat
- Margarine, shortening, lard, and corn oil
- White bread
- Rice, corn cereals, and instant oatmeal
- Soda, fruit juice, and drinks with added sugars

- Sweets such as cookies, cakes, pastries, muffins, donuts, brownies, pies, and other sugary foods (Jones, 2019)

Case study 6

Jason is a 32-year-old man who recently was diagnosed with irritable bowel syndrome (IBS). He has chronic stomach pain and has begun to have headaches as well. This has made it difficult for him to function at work. He has had to go home sick several days already this month and his employer is becoming frustrated.

Jason decided to submit medical paperwork protecting him from being fired or penalized on the job but he wants to focus on healthy approaches to healing himself and having less pain. He decides to accept a referral from his gastroenterologist to see a nutritionist.

Upon meeting with the nutritionist, Jason felt nervous because he knows that he doesn't always eat well. He is a construction worker and often eats fast food and drinks soda throughout the day at work. He also smokes cigarettes and drinks beer every evening. He thinks of himself as having the traditional "bachelor lifestyle" diet.

When Jason meets with the nutritionist they complete an assessment of his health: he is of average weight and muscle mass, he has been historically healthy, he has had anxiety for most of his life, and his IBS symptoms began about 18 months ago. Jason's pain is mostly related to the IBS and headaches that are likely caused by issues in the gut.

When they discuss his diet, it is clear to Jason and the nutritionist that changes need to be made to reduce inflammation in the gut. He agrees to stop drinking beer and soda and instead chooses to drink wine or seltzer. He discontinues eating pre-made meals and fast food and together the nutritionist and Jason develop a meal planning procedure that can help him be successful in having healthy foods that will support his health. He begins eating less processed meats and buys organic, free-range chicken from a local butcher. Within several months, Jason notices that his IBS symptoms are under better control and he is having less daily stomach pain.

After one year, Jason realizes he has only missed a few days of work compared to the few days per month he was missing before. He also notices he has fewer headaches, more energy, and feels more comfortable and less bloated. Jason believes that the improvements to his health and the reduction of his chronic stomach pain are from drastically changing his diet. He still has IBS and pain but his pain is more controlled and tolerable. It is impacting his quality of life less as time goes on. Jason's case is a good

example of how diet has positively impacted health when it is tailored to the specific condition and health needs of the individual. Working with a nutritionist and health team to develop an appropriate diet and treatment plan is one of the best ways to implement such profound diet changes.

Hyperbaric oxygen chambers

Perhaps less known than acupuncture and other drug-free pain management programs is hyperbaric oxygen therapy. Hyperbaric oxygen chambers inhale 100% oxygen at an atmospheric pressure that the patients lay in (Pejic, 2018). When this happens the hemoglobin increases and more oxygen is delivered to the patient's tissues, offering to heal. This form of oxygen therapy was created for individuals who dive in the ocean and experience accidents or decompression illnesses. It has been adapted to serve patients with soft tissue injuries, chronic wounds, ischemia, radiation injury, pain, dysfunctional syndromes, fibromyalgia, fatigue, headaches, and other complex issues.

Research has found that this treatment has positive clinical effects on reducing pain. Some studies found that pain was decreased significantly within two months from the beginning of treatment. Patients report an increase in physical functioning, decreased mental health distress, and an overall improvement in the quality of life (Pejic, 2018).

Hyperbaric oxygen therapy may be anxiety-producing for some at first because of being in a sealed oxygen chamber. Patients will be in the chamber with a pressure of up to three times the normal air pressure (Dufour, 2020). In the chamber, the air is 100% oxygen, which is almost five times the air pressure outside (Dufour, 2020).

If patients feel worried or anxious about entering the chamber, it is suggested to perform deep breathing or other relaxation strategies when first entering the chamber.

Case study 7

Tabitha is a 37-year-old woman with arthritis. She has had pain her entire life and the inflammation she has is often increased in the winter months when the weather is cold. During the cold months, she struggles to exercise and function the same way that she does in the summer. When she is older she hopes to retire to an environment where it is warm all year long to avoid this kind of disruption to her health and quality of life.

This year the winter has been worse than Tabitha had planned for and her pain is becoming increasingly difficult to navigate. After a visit to her physician, Tabitha decides to attempt oxygen therapy as suggested. She finds a local spa where she can have an

unlimited amount of sessions for a monthly fee. Tabitha decides to attend two days per week to simply see if it helps her feel any better.

Tabitha finds oxygen therapy to be quite comforting. She realizes that she likes laying in the chamber and she feels no anxiety or discomfort. This in itself is a win because she works a high-stress marketing job and rarely finds time to lay down and simply rest.

After several weeks of using the oxygen therapy chamber, Tabitha notices that her chronic pain has reduced from a 6/10 to a 4/10. She feels as though it is directly correlated to the use of this new treatment tool. Tabitha's case is a good example of how a hyperbaric oxygen chamber can be helpful for chronic pain.

Massage therapy

Massage is often a common treatment intervention for patients with chronic pain. Massage is found to help relieve pain by relaxing painful muscles, tendons, and joints (Harvard Health Publishing, 2016). It supports the reduction in anxiety and stress and reduces the pain signals sent from the brain to the body. This reduces the long-term experience of pain.

Massage therapy for pain has been mostly used for back, hand, neck, and knee pain but should not be limited to these areas. Patients with chronic pain who receive massages regularly generally sleep better and have improved strength and functioning. Many patients will learn to massage themselves as a way of relieving pain at home.

Massage therapy will involve different types of pressure. Some patients find that deep tissue massage is essential for reducing pain and others find it pain-inducing. Many patients require the lightest of massage to be tolerable. Patients should consult with their physicians and massage therapists before beginning treatments to identify the best course of action and set boundaries regarding the experience. While massage will not be harmful, it could be painful for some.

Patients mustn't be experiencing a flare-up when receiving a massage. If patients are massaged on areas where they are experiencing inflammation, the inflammation can be increased or become irritated. This will be uncomfortable. Additionally, if an area of the skin is infected the hands of the massage therapist could both move the infection to other areas and potentially become infected as well (Harvard Health Publishing, 2016).

The Physician Partners of America (2020) identify the following ways that massage is beneficial for chronic pain:

1. **Improving blood circulation** – individuals who have poor blood circulation often have aches, pains, and fatigue because of the lack of acid in the muscles. They are likely to experience coldness often in their hands and feet as well. Improving blood flow through massage will reduce pain and improve overall comfort
2. **Joint pain management** – massage therapy helps to reduce swelling in the joints, which reduces overall pain. This can also reduce the number of uncomfortable spasms that the muscles experience. Massage also produces endorphins, which reduces the body's pain sensation
3. **Reduction in blood pressure** – patients with pain often have high blood pressure, are obese, and are very stressed. Trigger point massage therapy, often used in massages for patients with pain, reduces heart rate and blood pressure, therefore improving overall health
4. **Muscle pain relief** – Stimulating the spinal cord helps reduce tension in muscles. Patients with low back pain, neck pain, shoulder pain, and knee pain often benefit from deep massages and spinach cord work
5. **Stress reduction** – because patients with pain are often stressed in many different life domains, they hold tension in their neck and back. Patient stress is reduced through massage by enabling exposure to a calm and warm environment, promoting a more active lifestyle, and reducing the pain that leads to stress (Physician Partners of America, 2020).

Massage, much like acupuncture, is an ancient medicine that was originally used in China and Egypt (D'arcy-Sharpe, 2020). Some studies have found that serotonin levels increase by 28% after a massage and dopamine increases by up to 31% after a massage. This promotes joy and happiness for patients, which greatly reduces stress. Positive mindsets are essential for patients with chronic pain. Individuals who think positively cope with stress and pain better and live more adaptive lives.

Massage, like many other interventions, should be used in combination with a variety of treatment methods to be most successful for reducing chronic pain. Patients should expect the following different types of massage to be suggested by their medical team:

1. **Swedish massage** – this is often thought of as a traditional massage where professionals kneads and rolls the muscles, therefore relieving tension. The pressure will be determined by the patient's comfortability and goals for the massage. This massage should not be painful

2. **Hot stone massage** – professionals will utilize hot stones in combination with Swedish massage techniques. The stones support relaxation and pain relief because of the heat. A hot stone massage is often thought of as helpful for promoting sleep
3. **Deep tissue massage** – deep tissue massage offers much more pressure than other types of massage. This helps to relax muscles that are tenser than a Swedish massage could undo. Communication with the massage therapist is essential during a deep tissue massage because it could become painful and it should not. Patients are generally sore after a deep massage for a few days but should not have pain beyond soreness
4. **Trigger point massage** – trigger point massage is the process of targeting a specific point of pressure on the body to release tension and pain. The pressure is applied firmly and deeply to the points until they release. This too can be painful and uncomfortable and it is important to communicate throughout the treatment
5. **Myofascial release** – the layers of connective tissue that cover the muscles in the body are called the fascia. The fascia should be flexible when healthy. A massage therapist will be able to feel if it is or is not flexible and healthy and therefore apply pressure to release tension. This supports a reduction in anxiety and pain and an increase in sleep and quality of life
6. **Shiatsu** – during this massage, the therapist will use pressure in a pulsating fashion to induce relaxation. Acupressure points will be activated, which should induce further relaxation. This massage improves pain intensity, pain threshold, and supports sleep
7. **Thai massage** – Thai massage combines massage and yoga. The therapist will gently apply pressure to pressure points while the patients hold a yoga pose. The therapist supports stretching and moving of the body in specific ways to reduce tension and stress. Thai massage is found to reduce pain through improving range of motion, physical functioning, and improving mood and psychological functioning
8. **Foam rolling** – foam rolling is an effective method for self-massage that many people utilize at home. It has become very popular with athletes and is not limited to chronic pain patients. Foam rolling includes using firm foam to roll different parts of the body on as the foam will lay on the ground and patients will apply

their body weight to the foam and then roll out different tight muscles (D'arcy-Sharpe, 2020)

Case study 8

Samuel is a 42-year-old professional baseball player who has been a pitcher his entire life. He loves baseball but has chronic pain in his throwing arm and is having to reduce the number of pitches he can throw during a game to support the longevity of his career in professional baseball.

Samuel has arthritis in his throwing arm and has been struggling with how to navigate this new pain and the impact it could have on his career. Samuel has not historically used massage as a form of treatment but has recently accepted a referral from his coach to access massage several days per week.

The massage therapist generally focuses on his upper body: arms, shoulders, and neck. He realizes that his pain has been radiating up his neck but that he hasn't noticed until massage because he focuses so much on his throwing arm. The massage therapist works with Samuel to release the tension in his muscles and teaches him strategies to better warm-up. Samuel feels silly to admit that he's never focused much on warming up the way he should because he was always inherently healthy. He's only begun having pain the last six months or so.

With the help of the massage therapist and better pre and post-game stretching, warming up, and cooling down, Samuel is having less pain and can throw more pitches after several months.

Samuel's case is a good example of how massage therapy can be helpful to treat chronic muscle pain and arthritis.

Chiropractic care

Chiropractic care is commonly used for patients with chronic back pain. Chiropractic care focuses on the structure of the body and especially the spine (Harvard Health Publishing, 2018). The chiropractic doctor will manipulate the alignment of the body to reduce pain and improve functioning. This supports the body in healing itself. Chiropractic care includes the following:

- Spinal manipulation
- Postural and exercise education

- Heat or ice
- Massage
- Ergonomic training to teach patients how to walk, sit, and stand in a way that reduces strain and pain
- Cross-systems care by working with other providers to support patients (Harvard Health Publishing, 2018)

Chiropractic care helps with chronic pain from the following conditions:

- **Degenerative disc disease** – degeneration is the cause of chronic back pain for many people (Spine Universe, 2020). When the spine degenerates, the mechanics of the spine no longer work properly. This often causes bulging and pressure on the nerves, which can be very painful. This pain can radiate down the spine and into the legs. Chiropractors support degeneration by manipulating the spine (manually or using instrument-assisted manipulation) to promote better disc functioning
- **Herniated discs** – in between most vertebrae of the spine some discs act as shock absorbers and distributors. They work to be flexible and support the spine during movement. Herniated discs are those that push out of place and can no longer properly support the spine as intended. This happens through trauma, age, and stress on the discs (for example, from being overweight). Chiropractic care helps manage disc pain through spinal manipulation, manual therapy, and therapeutic exercise. The chiropractor will use a flexion-distraction technique to stretch the spine and reposition the disc, hopefully alleviating pain or pressure from the area. They may also use pelvic blocking strategies by placing wedges under each side of the pelvis and exercising the area to move the disc away from the nerves it may be pressing on
- **Kyphosis** – kyphosis causes a rounded middle back that often is referred to as a “hump.” This is most often caused by poor posture or scoliosis but can be caused by trauma or injury to the area. The chiropractor will work with patients to diagnose the cause of the kyphosis as well as treat it. Treatment will include x-rays to understand the severity, adjustments to attempt to move the spine, education on how to have better posture, and movement of the joints. The goals of chiropractic care for kyphosis include the following: reduce inflammation, decrease muscle spasms, maintain spine health, improve muscular strength,

reduce chronic pain, slow the degeneration in the middle back down as much as possible, and treat the intervertebral discs

- **Sciatica** – sciatica pain is often referred to as dull, achy, sharp, or toothache-like pain. It can cause some individuals to feel numbing, burning, or electric shocks down their legs. This kind of pain is caused by compression of the nerves and is common for people who are pregnant, people with spinal tumors, and people with diabetes. Chiropractic care for sciatica includes manual adjustments to free restricted movement of the spine and therefore promoting functioning and reducing pain. It may also include the use of heat, ice, and TENS units
- **Spondylolisthesis** – spondylolisthesis is caused by a slipping vertebra(s) in a forward motion. This causes pain to the spine and other areas, especially in the low back. The goal of chiropractic care for this condition is to improve the mechanics of the spine, improve posture, and improve functioning. Chiropractors do this by addressing the joints above and below where the vertebra slipped
- **Spinal osteoarthritis** – this condition affects the spine's joints, the neck, the mid-back, and the lumbar. Chiropractors support patients with this arthritic condition to align the vertebra as much as possible and reduce pain and improve function while doing so. This must be done in combination with ice, heat, massage, and other lifestyle adjustments because the condition will be lifelong in duration and require ongoing treatment (Spine Universe, 2020)

Case study 9

Cameron is a 52-year-old man who recently threw his back out at work. He works a general labor job and has his entire life. Injuring his back seems to have caused a flare-up in his chronic low-back pain and Cameron decided to return to the chiropractor after a month or so of not having been adjusted.

Cameron knows his chiropractor well because he has a longstanding history of chronic low-back pain. Together Cameron and his chiropractor develop a plan for twice-weekly adjustments for the next four weeks. Cameron attends every adjustment and while they were difficult at first, the spine manipulation becomes easier and less painful over time. After each adjustment, he lays on heat and ice to calm the low-back.

Within four weeks of regular adjustments, Cameron's pain is reduced to the original baseline pain that he was experiencing. Together he and his chiropractor agree that

missing regular biweekly treatment isn't helpful and this could be the cause of the recent acute injury at work.

Cameron returns to biweekly adjustments and within a year his baseline chronic pain level is reduced even further. Cameron's case is a good example of how chiropractic can be helpful in acute and chronic pain situations.

Meditation

Some may wonder why meditation would be considered a treatment for chronic pain and may even argue that it is not an appropriate treatment for chronic pain, however, meditation is found to be helpful for people with persistent pain. Some studies show that a regular meditation practice to reduce stress can also reduce chronic pain (Hecht, 2020). The following is a brief overview of some of the research completed on meditation and pain:

- A 2012 study found that people who practiced mindfulness had pain reduced by 22%
- A 2014 study found that meditation reduced the anxiety and depression of chronic pain patients
- A 2017 study found that 30% of patients with chronic lower back pain had a reduction in pain by using mindfulness-based stress interventions
- A 2018 study found that mindfulness is helpful for patients with chronic headaches, fibromyalgia, and irritable bowel syndrome
- A 2018 study found that people who meditate are less sensitive to pain as identified by MRI scans of the brain
- A 2019 study found that mindfulness is associated with lower pain sensitivity

The following strategies should be considered for patients with pain who use meditation or want to use meditation for pain management:

1. **Mindfulness:** quietly concentrate on the thoughts without judging them or forcing them to pass – this is one of the most popular forms of meditation and the most studied. Many applications and free online resources exist to lead a person through mindfulness meditation

2. **Visualization meditation:** guided imagery or visualization is used to imagine something positive during meditation. Focusing the thoughts on a pain-free, positive experience can help to reduce stress and pain and provide a sense of calmness
3. **Breathwork meditation:** breathwork is the process of using breathing patterns and exercises to relax the mind
4. **Body scanning:** the brain focuses on the body from the top of the head down to the toes and all the areas in between. The goal is to notice the way the body experiences sensations and relaxes (Hecht, 2020)

Case study 10

Charles is a 28-year-old man who has had pain his entire life as related to a skiing accident in his middle school years. He injured his spine and while he was able to recover most of his functioning, he continues to have pain related to nerve damage and compression on his discs in his low-back. Despite the strategies he uses, it appears he is unable to reduce the pain.

Charles recently began a breathwork meditation every morning because this is when he has the most pain. It was recommended to him by a friend who also has chronic pain. At first, Charles thought it might be silly but now he believes it could be working.

Every morning Charles completes a 5-minute meditation on breath work that he finds on YouTube. He does this sitting up in bed before exiting bed to start his morning. After a few weeks, he notices that he looks forward to the breathwork session and feels less frustration about the anticipation of morning pain.

Charles' case is a good example of how meditation is a helpful practice for many people with chronic pain issues.

Cognitive Behavioral Therapy (CBT)

Patients who struggle with chronic pain are more likely to experience anxiety, depression, and a variety of other mental health disorders due to the stress of the pain. Cognitive behavioral therapy is a necessary therapeutic modality for many patients with chronic pain because research has found that it can be successfully applied to chronic pain and is helpful in managing it (Murphy, McKellar, Raffa, Clark, Kerns, & Karlin, n.d).

Therapists who utilize a cognitive behavioral therapy model for chronic pain may use a few different strategies:

1. Identifying goals based on activities and developing a plan to increase engagement in those activities. For example: attend the walking program 3 days per week
2. Develop a plan to accomplish tasks in a way that is thoughtful and sensible based on the individual's pain and presentation of symptoms
3. Relaxation training: strategies to reduce stress and induce relaxation and muscle calmness are identified and utilize
4. Cognitive restructuring: patients identify unhelpful thoughts and implement strategies to think in a more balanced and adaptive way
5. Behavioral activation: patients will increase engagement in the activities that give them joy and meaning

CBT identifies the following psychological factors to be addressed concerning pain:

1. **Pain cognitions:** negative thoughts and beliefs about pain will often promote maladaptive coping and exacerbate the pain that patients experience. They may feel more suffering and have a greater disability when they think about their pain in negative ways. Because of this many therapists will focus on the thoughts or beliefs about pain instead of the actual pain itself
2. **Catastrophizing:** patients who assume the worst about their pain and their health are more likely to have intense pain, distress, and fail to cope effectively. They may believe that their pain will never end or always be present. They may also believe that despite all of their efforts the pain will never subside or improve. This negatively impacts treatment and often prevents the body from self-healing. Catastrophizing can be interrupted by CBT in therapy
3. **Hurt vs. harm:** some patients with chronic pain will misinterpret pain as further damage to their body instead of a normal part of their pain experience or journey. Individuals who do this have decreased activity and functioning
4. **Negative effect:** individuals with chronic pain are more likely to experience depression and anxiety. Negative emotional states are positively correlated with more pain

5. **Answer seeking:** when patients refuse to accept the cause of their pain or are unwilling to accept that their pain cannot be determined or diagnosed, they may struggle to manage it. The thought that their pain is a mystery may cause more distress than actually having a diagnosis or determinant of pain
6. **Pain self-efficacy:** believing that the person can adapt to or manage the pain often leads to more control or exertion of the pain, therefore individuals with less of this experience less control
7. **Guarding:** when patients guard they will limp, brace, or protect a part of their body after the body is fully healed. This reinforces the belief that they are disabled or unable to function at full and independent capacity. This can lead to secondary issues such as a lack of alignment
8. **Resting or under-activity:** many patients may believe that rest is the perfect answer for their pain when they need movement for strengthening and improving their health. Rest is helpful but should be used in combination with activity for most people with chronic pain. This psychoeducation can be taught in CBT and a plan can be developed for how to begin movement again
9. **Over-activity:** like under-activity, patients who over-exercise in the hopes of improving more quickly may struggle with pain continually. Over-exercise can cause inflammation and more disability

CBT theories propose that the chronic pain cycle looks something like this:

Distress or disability -> chronic pain -> decreased activity/deconditioning -> negative emotions -> avoidance/withdrawal -> distress or disability

CBT aims to address the negative emotions and thought patterns that arise during chronic pain and as deconditioning occurs to prevent avoidance and further disability and distress (Murphy, et al., n.d.).

Case study 11

Carmen is an aging woman who has been noticing more and more pain over the years. She recently turned 67 and has been struggling with thoughts such as “I’m never going to feel better” or “I’m not the grandmother I should be to my grandchildren because I can’t do the things I want to do.” These kinds of thoughts are catastrophizing her health and wellness.

Carmen decided it was time to talk with a professional about her chronic pain and frustrations. She recently began seeing a therapist. At first, she was hesitant to talk about the sadness she has associated with her pain but after discussing the negative mental health consequences of the pain, she realizes she needs to address these thoughts that are keeping her from living a full life.

Carmen attends weekly therapy for almost one full year before she begins to notice real changes in her cognition about her pain. Eventually, she notices herself thinking things such as “what can I do with my grandchildren?” instead of “what can’t I do with my grandchildren?” or “what am I going to miss?”

Carmen does not report at the end of one year of therapy that her pain has decreased but she does report that she notices it less and feels more supported in the management of her pain. She states: “I never want to stop going to therapy now.”

Carmen’s example shows how noticing and adjusting thoughts can significantly impact a person’s worldview and thoughts about their pain.

Acceptance and Commitment Therapy (ACT)

Acceptance and commitment therapy, like CBT, is another counseling modality that mental health therapists use for patients with chronic pain. ACT utilizes a combination of psychological interventions and mindfulness practices to increase psychological flexibility and reduce the stressors associated with chronic pain (Wynne, MgHugh, Gao, Keegan, Byrne, Rowan, Hartery, Kirschbaum, Doherty, Cullen, Dooley, & Mulcahy, 2019).

There are six core processes of ACT that support patients in developing the psychological flexibility required to best support and manage chronic pain (Ackerman, 2020). They are as follows:

1. **Acceptance:** this is an alternative to always thinking about the negative and rather choosing to allow the uncomfortable situation to exist as it will without attempting to change it or deny its existence
2. **Cognitive defusion:** this refers to the way that individuals react to their feelings. By acknowledging the feelings instead of avoiding them, the person will have less fixation on the experience of pain
3. **Being present:** patients must be aware of the present moment. They must perceive what is happening without judging and allow the experiences to be felt. This is a learned behavior

4. **Self as context:** many patients with chronic pain will begin to identify as a person with pain. This identity becomes a significant part of who they are and how they relate to the world. Self as context assumes that the individuals are not just a sum of their experiences or feelings but rather that there is an entire experience waiting for them if they can think outside of their small world. This is difficult when the individuals feel a great amount of pain
5. **Values:** ACT proposes that all people can choose to work toward a certain set of values in a given moment. They do this consciously, although they hold values unconsciously at times as well. ACT helps identify the chosen set of values and develop a plan using tools and strategies to live according to those values
6. **Committed action:** ACT focuses on committing to actions that support long-term goals and not simply temporary pain relief. Patients should understand how positive behavioral change can be beneficial to their life and health

Steven Hayes was a professor at the University of Nevada when he developed ACT in 1986. ACT was founded on the belief that suffering should not be avoided but rather accepted as it is a normal part of the human experience. He saw that many individuals were going to extreme lengths to avoid discomfort when they could be deriving strength and fulfillment from the experiences if they stopped avoiding them.

ACT helps patients to identify their triggers and the impact of those triggers on their behavior. It helps them to clarify and establish their values. It supports the ability to open up to others about their experience and focus on the present moment. It helps them to identify the thoughts they must think or the thoughts they must eliminate in order to feel happiness. It uses mindfulness strategies to promote relaxation and calmness in the body (Ackerman, 2020).

Case study 12

Susan experienced a biking accident two years ago and went from walking and functioning independently to utilizing a wheelchair for her mobility. She loved to bike and was a regular bike commuter in her city when she was hit on a side street and suffered a spinal injury leaving her paralyzed from the waist down. She has consistent pain in her legs, despite not being able to use them functionally. This makes Susan very angry. She wants her life back and is frustrated with the lack of engagement she now has with activity compared to her life before.

Susan decides to begin working with a therapist using ACT. She wants to learn to accept the accident and her life so that she can rebuild. She feels stuck in her anger and isn't sure how to move forward with her life.

During her ACT therapy, Susan focuses on staying present with her feelings and allowing them to come and go naturally. She begins to think about her life as having so many possibilities, including exercising again. This is an alternative to her previous thoughts about her body failing her and no longer being able to be active.

Susan reports that after almost one year in therapy she is feeling more confident in her body and less overwhelmed with pain. She's even reached out to a local gym that focuses on adaptive strengthening and fitness and is looking forward to exploring moving her body again through exercise.

Hydrotherapy

Water is a helpful tool for chronic pain and moving the body in a way that is low-impact and comforting. Most hydrotherapy involves patients being in a pool that is heated warmer than a typical swimming pool (D'arcy-Sharpe, 2020). The heat is calming for the body and promotes relaxation.

Hydrotherapy is helpful for chronic pain because of these four effects:

1. **Buoyancy:** patients will float in water because gravity is opposed
2. **Hydrostatic pressure:** patients have less pressure applied to them
3. **Hydrodynamic forces:** there is still resistance against the muscles in water, which helps strengthen
4. **Thermal conduction:** heat from the water is transferred into the body 25x faster than when on land surrounded by air

Patients can expect the following when receiving hydrotherapy:

1. **Exercise:** patients will exercise in the water for fitness building as well as stress relief and muscle building. Water exercise is generally less painful than on land because there is little tension and weight on the muscles. This helps to build strength without pain
2. **Movement is more comfortable:** the ability to move will release positive endorphins that promote happiness and wellbeing. These endorphins relate to the

opioid receptors in the brain and promote a kind of warming effect, without being addictive or dangerous

3. **Heat:** the heat from the water will interrupt the pain signals that are sent from the brain to the body, and therefore patients will have less pain. This can act similar to using a heating-pad or topical gel that provides a warming sensation
4. **Confidence:** often patients with chronic pain will have limited confidence to pull from when engaging in exercise or movement. When in water it becomes much easier and more comfortable to move and so patients often report increased confidence in this setting. This helps to boost morale and decrease anxiety. This also helps patients to want to exercise or attend hydrotherapy again in the future
5. **Individual or group:** hydrotherapy is provided both individually and in group settings. It can be easier for patients to attend at their local gym or community pool as compared to finding a resource through insurance reimbursement. Patients should still have their medical team be aware of and approve the use of hydrotherapy if they attend somewhere that is not affiliated with their medical team and insurance
6. **Access:** if entering and exiting the pool area is difficult for patients, they should always have a therapist or coach assist them in and out of the pool. There are always wheelchair ramps and enter/exit areas to utilize as well (D'arcy-Sharpe, 2020)

Hydrotherapy is found to improve pain, chronic fatigue, and quality of life (Zamuner, Andrade, Arca, & Avila, 2019). Hydrotherapy promotes musculoskeletal, neuromuscular, cardiovascular, respiratory, and neuroendocrine health. It does this through the buoyancy provided. This helps to assist or resist movements, offload the body's weight, and help activate muscles and range of motion. It also does this by driving fluids from the extremities towards the central cavity. This compresses the thorax and increases respiratory load. Research finds that pain is greatly reduced after twelve weeks of consistent hydrotherapy (Zamuner, et al., 2019).

Case study 13

Tamara is a 17-year-old girl who was born with several contractures in her hands and feet. She struggles to walk and uses adaptive crutches for mobility. She has pain where the contractures are located. The pain she experiences has been increasing with age as her body grows and develops. Tamara was recently referred for hydrotherapy and is

looking forward to being in the pool although she has to do so with the assistance of a therapist.

Tamara and her therapist focus first on movement for her upper body. She uses a floating device at her waist to support her for exercises. After several weeks of only upper body movement, she begins to focus on her core and lower body.

After several months, Tamara reports having less pain and more mobility in the areas that she has contractures. She plans to continue attending hydrotherapy for years to come because it reduces her pain and she feels confident in the pool and enjoys the heat on her muscles.

Tai chi

Tai chi is often thought of as exercise and overlooked as a form of medicine or treatment for chronic pain, although it can be very helpful for pain. Tai chi is a low-impact exercise that focuses on the mind-body connection (Harvard Health Publishing, 2015). It is a slow-motion movement that focuses on the breath, meditation, stretching, and mindfulness. It is a practice that is several thousand years old.

Tai chi will take patients through a series of motions that are often named after animals or animal movements. For example, “white crane spreads its wings” is a movement. When moving, patients will focus on breathing deeply and naturally and noticing the energy that they feel throughout their bodies. Tai chi helps to support balance, coordination, flexibility, muscle strength, and stamina. It also reduces stress, improves the awareness of the body, and leaves patients feeling more connected to others when completed in groups.

Research shows that regular tai chi practice can help patients with osteoarthritis, rheumatoid arthritis, fibromyalgia, tension headaches, and other chronic pain conditions (Harvard Health Publishing, 2015). Tai chi shifts weight and helps support musculoskeletal health, improve strength, and improve joint stability. It also supports mood by using mindfulness strategies. This supports the immune and autonomic nervous system functioning (Kong, Lauche, Klose, Hui Bu, Yang, Guo, Dobos, & Cheng, 2016).

Case study 14

Tom is a 29-year-old man who was injured several years ago in a boxing match. He had multiple concussions back to back and now has chronic headaches. Tom is frustrated

that he can no longer box and also that headaches have been consistently bothering him for years.

To gain some control of his life and his body, Tom enrolls in a local tai chi class. He does this simply to celebrate his body through movement again and to reconnect with it.

After several months of tai chi practice twice daily (once in the morning at home and once in the evening in class) he feels less tension in his upper body and notices fewer headaches. Tom believes that his muscle tightness was adding to the migraines and now that he's more flexible he is having less headache pain.

Tom's case is a good example of how moving and conditioning the body can help the body to heal.

Conclusion

There are many different drug-free methods and tools that may be utilized to manage and reduce chronic pain. Using drug-free approaches ensures that patients have more control over their body, mind, and spirit and have fewer negative consequences associated with narcotic use.

Patients should work with their treatment teams to identify the most appropriate method based on their specific pain and diagnosis or injury. They should utilize the tools and strategies with the supervision of licensed professionals. They should also consider not only physical health strategies but emotional and mental health strategies such as mindfulness and therapy as a way of coping with pain.

Chronic pain is difficult and frustrating, but it does not have to control the entire lives of those who experience it.

Keywords

Chronic pain: pain lasting longer than several months that generally cannot be completely treated

Acute pain: pain lasting shorter than several months that will subside after treatment

Drug-free pain management: interventions and strategies utilized that do not involve narcotics or opioids for managing or reducing pain

Hyperbaric oxygen therapy: involves breathing pure oxygen in a pressurized environment.

Physiotherapy: the treatment of disease, injury, or deformity by physical methods such as massage, heat treatment, manual manipulation and exercise rather than by drugs or surgery. Most often in a post-acute setting

Osteopathic medicine: is a drug-free, non-invasive manual therapy that aims to improve health across all body systems by manipulating and strengthening the musculoskeletal framework.

Yoga: a Hindu spiritual and ascetic discipline, a part of which, including breath control, simple meditation, and the adoption of specific bodily postures, is widely practiced for health and relaxation

Physical therapy: the treatment of disease, injury, or deformity by physical methods such as massage, heat treatment, and exercise rather than by drugs or surgery

Acupuncture: a system of integrative medicine that involves pricking the skin or tissues with needles, used to alleviate pain and to treat various physical, mental, and emotional conditions.

Massage therapy: the rubbing and kneading of muscles and joints of the body with the hands, especially to relieve tension or pain

Chiropractic care: a system of integrative medicine based on the diagnosis and manipulative treatment of misalignments of the joints, especially those of the spinal column, which are held to cause other disorders by affecting the nerves, muscles, and organs

Meditation: the action or practice of meditating

Cognitive Behavioral Therapy: is a form of psychological treatment that has been demonstrated to be effective for a range of problems by adjusting maladaptive thought processes to more adaptive thought processes

Acceptance and Commitment Therapy: encourages people to embrace their thoughts and feelings rather than fighting or feeling guilty for them

Hydrotherapy: the use of exercises in a pool as part of treatment for conditions such as arthritis or partial paralysis

Tai chi: an ancient Chinese discipline of meditative movements practiced as a system of exercise

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