

# Pain Management Issues

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Note: The issue of pain is actually a complex medical and psychological issue. The purpose of this powerpoint is to give an overview, give information, and for education. This is not a substitute for qualified health care.

# Outline on Pain Management

- Overview/Opening
- What is Pain? Two Types of Pain
  - Emotional
  - Physical (bone, nerve, muscle, and fascia)
  - Other (covered in the addendum)
- Identify Types of Pain Symptoms
- Types of Treatment Overview
- Specific Types of Treatment
  - Conventional Drug Treatments
  - Conventional Drug Treatments-Other
  - Energy Medicine (Acupuncture, Homeopathy, Reiki, and Therapeutic Touch)
  - Hypnosis
  - Meditation
- Movement based therapies (breathing, Qi, Qi Gong, Tai Chi, Yoga, and etc.)
- Nutrition, Hydration, Nutritional Supplementation, Herbs and plant based sources, and Miscellaneous
- Prescription Type of Drugs
- Relaxation training
- Other: Autoimmune, Sleep, and Spirituality Issues
- Addendum
  - Listed on the next slide
- Conclusion

# Outline on Pain Management Addendum

- Bibliography
- CBD Hemp
- Fibrin
- Food as a source of pain
- Glossary
- Importance of Exercise
- Issues with conventional and drug approaches to pain relief
- Kratom
- Medicinal Marijuana
- Nootropics
- Other Types of Pain
- Proteolytic Enzymes
- Statistics

# Overview/Opening

- The most common health issue is pain. This affects 100 million Americans and 1.5 billion people world wide. It is more common than cancer, heart disease, and diabetes combined. When pain occurs, it is a message from the body that something is going on that merits attention.
- Diagnosing the source of pain actually can be a complex process to diagnose.
- The current opioid crisis in this country is fueled by pain these people are feeling.
- Pain can be acute (short term) or it can be chronic (long term).
- When experiencing pain, especially chronic pain, it helps to keep a diary of your pain episodes, after specific events or even what you are eating. Include the date, time, pain location, severity of pain from 0 to 10, thoughts and feelings, action, and comments.

Source: The Everything Gide to Integrative Pain Management (2015) by Traci Stein, Ph.D. MPH. (Publisher: Adams Media), page 11.

# What is Pain? Two types of Pain

## Physical

- Our first response to noticing pain is through physical symptoms.
- The next slide lists the various types of pain sensations that we can feel.

## Emotional

- Emotional sources of pain are more in the hurts and bad feelings from situations that causes us harm.
- If left unresolved, it can move into becoming physical pain.

Note: Other types of pain is covered in the addendum.

# Identifying Types of Pain Symptoms

•Aching	•Heavy	•Severe
•Burning	•Hot	•Sharp
•Constant	•Intense	•Shooting
•Cramping	•Intermittent	•Squeezing
•Crushing	•Itching	•Stabbing
•Cutting	•Mild	•Stinging
•Dull	•Pounding	•Tender
•Electrical	•Pressure	•Throbbing
•Gnawing	•Prickly	•Tight
•Gripping	•Radiating	•Tugging

Source: The Everything Guide to Integrative Pain Management (2015) BY Traci Stein, Ph.D, MPH, page 15  
And <https://www.healthline.com/health/types-of-pain#other-considerations>

# Types of Treatment

- Conventional
  - Drugs
  - Medical devices
  - Surgery
- Other options
  - Nerve blocks
  - Oblation procedures
  - Neuromodulation techniques.
- Complementary
  - Energy Medicine (Acupuncture, Homeopathy, and Reiki)
  - Hypnosis
  - Meditation
  - Movement based therapies (yoga, tai chi, and etc.)
  - Nutrition, Hydration, Nutritional Supplementation, and Herbs
  - Relaxation training
  - Other: Autoimmune and Sleep

Source: The Everything Gide to Integrative Pain Management (2015) by Traci Stein, Ph.D. MPH. (Publisher: Adams Media), page 16. The focus of this presentation is on alternative approaches to pain management and relief with some attention on conventional approaches.

# Conventional Drug Treatments

- Drug therapies:
  - NSAIDs (nonsteroidal anti-inflammatory drug). They block the COX-1 and COX-2 enzymes. Can be taken for short periods of time.
  - Corticosteroid Drugs. They are considered steroids and suppress inflammation and reduce pain. They do have side effects especially with long term use.
  - Opioid (Narcotic) medications. You can develop a tolerance to these medications.
- Drug therapies continued
  - Antiepileptic drugs
  - Antidepressants
    - Tricyclics
    - SSRIs
    - Atypicals
    - Benzodiazepines
  - Note #1: These drugs do have issues as noted by the author. Opioid use can result in respiratory failure with 64,000 deaths annually.
  - Note #2: There seems to be an overlap between the pain and depression pathways in the body.

Source: Source: The Everything Guide to Integrative Pain Management (2015) by Traci Stein, Ph.D. MPH.  
(Publisher: Adams Media), pages 27-37.

# Conventional Drug Treatments -Other

## Procedures

- Diagnostic or Therapeutic Nerve Block
- Trigger Point Injections
- Facet Joint Blocks
- Neurolysis

## Devices

- Transcutaneous Electrical Nerve Stimulation (TENS)
- Cefaly
- Spinal Cord Stimulation (SCS) and Peripheral Nerve Stimulation (PNS)
- Stimwave Spinal Cord Stimulator
- Medication Pumps

Source: The Everything Guide to Integrative Pain Management (2015) by Traci Stein, Ph.D. MPH. (Publisher: Adams Media), pages 37-41

# Energy Medicine

## Acupuncture

### Reiki

- Acupuncture and Pressure Points
  - Tense Units
  - Trigger Points
- Homeopathy
  - There are some remedies in homeopathy can help reduce pain, especially Arnica Montana. It is helpful with acute types of pain.

## Homeopathy

## Therapeutic Touch

- Reiki
  - Reiki is a type of energy healing where you use the body's own resources to facilitate healing.
- Therapeutic Touch
  - Hands are used as sensors and rebalance the energy. It was originally used in nursing education and programs.

Note: Energy medicine in this case relates to physical, emotional, mental and spiritual aspects as it relates to health. It is not easily seen or visible by the naked eye.

# Hypnosis

- Hypnosis and guided imagery-They have been found to help reduce acute and chronic pain.
- Imagery is like imaging scenes and activity in your mind.
- Hypnosis is more like self-hypnosis, more like being in a trance, brought on by rhythmic activity

Source: The Everything Gide to Integrative Pain Management (2015) by Traci Stein, Ph.D. MPH. (Publisher: Adams Media), pages 160-172

# Meditation

- Meditation is the process of quieting the mind in order to spend time in thought for relaxation or religious/spiritual purposes. The goal is to attain an inner state of awareness and intensify personal and spiritual growth. In practice, meditation involves concentrated focus on something such as a sound, image or feeling.
- Meditation offers time for relaxation and heightened awareness in a stressful world where our senses are often dulled. Research suggests that meditation has the potential for more than just temporary stress relief.
- There are different types of meditation. As it reduces stress, it has been found to reduce pain.

Source: <https://www.yogapedia.com/definition/4949/meditation>

Source: <https://www.medicalnewstoday.com/articles/320392.php>

# Movement based therapies (Breathing, Qi, Qi Gong, Thai Chi, Yoga and etc.)

- Breathing – Working on breathing techniques has been found to be beneficial (diaphragmatic breathing, belly breathing exercise, four square breathing, and progress muscle relaxation).
- Qi – (in traditional Chinese medicine and philosophy) the vital life force that flows through the body and is supposedly regulated by acupuncture.
- Qi Gong- Chinese system of breathing exercises, body postures and movements, and mental concentration intended to maintain good health and control the flow of vital energy.
- Thai Chi - Tai chi is a non-competitive martial art known for its self-defense techniques and health benefits. As a form of exercise, it combines gentle physical exercise and stretching with mindfulness. Research has produced mixed results but appears to show that tai chi can improve balance control, fitness, and flexibility, and reduce the risk of falls in older people.
- Yoga – Is a centuries old form of exercise as well as a spiritual science. It is getting in touch with yourself. There are many forms of yoga.

Note: Exercise has been found to be successful reduce pain, especially moderate exercise on a regular basis. It releases natural endorphins.

# Nutrition, Hydration, Supplementation, Herbs - Nutrition

- Nutrition
  - Evidence keeps growing that most Americans are not receiving optimum nutrition from their diets. Furthermore, too much of our food supply is now contaminated with chemicals from two sources, from the use of pesticides to grow food as well as the use of chemicals in food processing and packaging.
  - Animals from factory environments are given antibiotics and hormones. These substances end up in their tissues.
  - Questions are being raised about the long term impact to chemical and antibiotic use in our food supply to our health (not to mention wildlife and plant life).
  - Avoiding sugar and preservatives is a start for anyone experiencing pain.
  - For people experiencing systematic inflammation, they can try an anti-inflammation diet.
  - The other issue is biochemical individuality. What harms one person may not harm another person. This is especially true for infants, children and the elderly.

# Nutrition, Hydration, Supplementation, Herbs continued - Hydration

- Hydration
  - Clean water is essential to everyone's health.
  - Adding fluoride to municipal water systems needs to be discontinued as this form of fluoride is an industrial waste and neurotoxic.
  - Fracking has been shown to contaminate groundwater supplies.
  - Sodas and artificially sweetened drinks are not a substitute for clean water.

# Nutrition, Hydration, Supplementation, Herbs continued - Nutritional Supplementation

- Nutritional Supplementation
  - Nutritional deficiencies are commonplace in the United States.
  - Some of the nutritional deficiencies that are common and may play a role in causing pain are:
    - Magnesium
    - MSM Sulfur
    - Ozonated Potassium
    - Others - Iodine
- Other nutritional supplementation:
  - SAMe – helps reduce pain, stiffness, and inflammation
  - Vitamin D
  - Glucosamine, chondroitin, and MSM
  - Probiotics
  - Omega 3 fatty acids
  - Vitamin B12 and Folate Acid
  - Source: Stein. [page 105-139]

Source: The Everything Guide to Integrative Pain Management (2015) by Traci Stein, Ph.D. MPH. (Publisher: Adams Media), page 105-139.

# Nutrition, Hydration, Supplementation, Herbs and other plant based sources (Herbs/Plant) continued

## CBD Hemp

- A form of marijuana without the psychoactive components and combined with Hemp oil.
- It is found to have medicinal benefits.

## Nootropics

- Nootropics (NMN) – This may not require a doctor's prescription.
- *In general, a substance can be called a nootropic if it calms the brain and grants the user more control over their neurochemistry and the resulting behavioral and experiential outcomes. Many of the pain messages stem from the brain and a calmer brain can reduce the number of pain messages it sends out.*

Source: <https://www.nootropics.com/introduction-to-nootropics/>

# Nutrition, Hydration, Supplementation, Herbs and other plant based sources - Herbs/Plant continued

## Medicinal Marijuana

- [Medical marijuana](#) is a plant-based medicine from the *Cannabis sativa* or *Cannabis indica* species with three major active compounds: THC, CBD, and CBN.
- Medical marijuana is used for
  - pain,
  - [nausea](#),
  - [muscle spasms](#),
  - [anxiety](#),
  - [multiple sclerosis](#),
  - low appetite,
  - [sleep problems](#),
  - [autism](#),
  - [epilepsy](#) (seizure disorders), and
  - other conditions.

## Kratom

- Kratom is plant based substance from south east Asia and have been found to relieve pain.
- There are actually two types of kratom. There is the actual plant version of kratom and a synthetic version. It is recommended that the plant version be used, as they do not behave the same way. Research studies need to specify which type of kratom is being used.

Note: More information on Kratom covered in addendum.

# Nutrition, Hydration, Supplementation, Herbs continued - Miscellaneous

## Laminine

- Laminine is a superfood that is able to stimulate the use of the body's own stem cells to facilitate healing injured tissues.
- It is available as a supplement.
- Laminine is the only natural source of Fibroblast Growth Factor or FGF. The role of FGF is to "reprogram" stem cells in the body of an adult so that they can begin repairing damaged areas in your body.
- This process enables easier tissue repair and healing, thus the body gets to recover faster from a vast range of problems.

Source: <https://www.superiorhealthsupplement.com/what-is-laminine/>

## Proteolytic Enzymes

- Proteolytic enzymes play a role in dissolving the fibrin, a mesh that the body creates at the site of an injury, and dissolves it after it has been healed. When the fibrin doesn't get dissolved, it creates scar tissue and pain. This occurs more often as we get older.
- Note: More information on proteolytic enzymes are covered in the addendum.

# Nutrition, Hydration, Supplementation, Herbs continued - Miscellaneous

- **NMN** stands for Nicotinamide Mononucleotide and NAD (Nicotinamide Adenine Dinucleotide)
- It is able to help with cellular energy, metabolism, and gene expression.
  - Gained less weight with aging
  - Gained better function of their retina
  - Improve your heart/cardiovascular health
  - Improved insulin sensitivity (which plays a role in type 2 diabetes)
  - Increase your energy
  - Repair DNA
  - Reverse aging of blood vessels and grow muscle

Source: <https://www.prohealthlongevity.com/pages/nmn-supplement-reviews> and  
<https://www.prohealthlongevity.com/blogs/control-how-you-age/8-most-important-things-need-know-nmn>

# Relaxation Training

- A relaxation technique (also known as relaxation training) is any method, process, procedure, or activity that helps a person to relax; to attain a state of increased calmness; or otherwise reduce levels of pain, anxiety, stress or anger. Relaxation techniques are often employed as one element of a wider stress management program and can decrease muscle tension, lower the blood pressure and slow heart and breath rates, among other health benefits.
- Some of the techniques that are considered relaxation training include meditation, deep breathing, and yoga.

Note: Other activities like listening to music, or doing a hobby that you enjoy and find relaxing, can be considered relaxation.

Source: [https://en.wikipedia.org/wiki/Relaxation\\_technique](https://en.wikipedia.org/wiki/Relaxation_technique)

# Other: Autoimmune Conditions, Sleep, and Spirituality Issues

- Autoimmune Conditions – An autoimmune response occurs when the immune system attacks the body's own tissues. This can happen to our joints and muscle tissues, causing pain. One recommendation is doing a food elimination diet.
- Sleep
  - Circadian Cycle
  - Sleep Issues
- Spirituality Issues
  - It helps people to have a connection with a higher power, with God, regardless of which religion they belong to.

# Addendum

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- Nootropics
- Other Types of Pain
- Proteolytic Enzymes
- Statistics

# Addendum: Bibliography (page one of three)

- The Everything Guide to Integrative Pain Management: conventional and alternative therapies for managing pain (2015) by Traci Stein, Ph.D. MPH. (Publisher: Adams Media)
- <https://articles.mercola.com/sites/articles/archive/2018/03/05/proteolytic-enzymes-benefits.aspx>
- [https://en.wikipedia.org/wiki/Mitragyna\\_speciosa](https://en.wikipedia.org/wiki/Mitragyna_speciosa)
- [https://en.wikipedia.org/wiki/Relaxation\\_technique](https://en.wikipedia.org/wiki/Relaxation_technique)
- <https://losethebackpain.com/proteolyticenzymes/>
- <https://superspeciosa.com/kratom/maeng-da-kratom/>
- <https://www.baltimoresun.com/health/marijuana/bs-md-medical-marijuana-faq-20171207-story.html>
- <https://www.betternutrition.com/features-dept/enzymatichealth>
- <https://www.dictionary.com/browse/qi>

# Addendum: Bibliography continued (page two of three)

- <https://www.drugabuse.gov/related-topics/trends-statistics/overdose-death-rates>
- <https://www.drugs.com/illicit/kratom.html>
- <https://www.healthline.com/health/c-reactive-protein#crp-and-heart-disease>
- <https://www.healthline.com/health/types-of-pain#other-considerations>
- <https://www.healthline.com/nutrition/cbd-oil-benefits#section1>
- <https://www.healthline.com/nutrition/proteolytic-enzymes>
- <https://www.medicalnewstoday.com/articles/265507.php> (Thai Chi)
- <https://www.medicalnewstoday.com/articles/320392.php> (meditation)
- <https://www.nootropics.com/introduction-to-nootropics/>

# Addendum: Bibliography continued (page three of three)

- <https://www.prohealthlongevity.com/blogs/control-how-you-age/8-most-important-things-need-know-nmn>
- <https://www.prohealthlongevity.com/pages/nmn-supplement-reviews>
- <https://www.superiorhealthsupplement.com/what-is-laminine/>
- <https://www.yogapedia.com/definition/4949/meditation>
- Managing chronic pain in an age of addiction (2018) by Akhtar Purvetz, MD. (Publisher: Rowman and Littlefield)
- No grain, no pain: a 30 day diet for eliminating the root cause of chronic pain (2016) by Dr. Peter Osborne (Publisher: Touchstone)

# Addendum: CBD Hemp

- There is considerable controversy over the use of marijuana for medicinal purposes.
- Marijuana has been used to treat pain as far back as 2900 BC.
- There is a component of CBD combined with hemp oil and it has been found to help with a number of health issues besides pain. It does not have the psychoactive ingredients of the cannabis plant. It is called CBD Hemp.

Source: <https://www.healthline.com/nutrition/cbd-oil-benefits#section1>

# Addendum: Fibrin

- **What is fibrin?**
- Fibrin is an insoluble protein that acts as a first responder whenever your body is injured.
- When the call for help goes out, fibrin molecules rush to the scene.
- Shaped like long threads, each fibrin molecule interlaces to form a thin mesh around your wound.
- This mesh is critical for trapping the platelets and red blood cells needed to form blood clots.
- Proteolytic enzymes take on the role of dissolving the fibrin after the tissue has been healed.

Source: <https://losethebackpain.com/proteolyticenzymes/>

# Addendum: Fibrin continued

- **What happens if I have too much fibrin?**
- This fibrin malfunction is no laughing matter. Excess scar tissue restricts blood flow and oxygen throughout your body, slowing down your healing process and keeping you in pain longer. As the scar tissue thickens, it reduces your range of motion and contributes to chronic pain.
- These enzymes work by bringing nutrients and oxygen-rich blood that remove the metabolic waste produced by inflammation. When red blood cells caught in a web of excess fibrin, it restricts your blood flow.
- The cells actually get stuck. Ultimately, those red blood cells can't get into the capillaries to oxygenate and nourish your muscles and remove the metabolic waste that is causing your pain.
- Excess fibrin throughout your circulatory system will severely limit the amount of blood flow to areas that need it the most, you may be wondering how your body compensates for this restriction.
- The answer is simple: by forcing the heart to work harder and increasing your blood pressure. Some possible indicators of excess fibrin in your system include: chronic fatigue, slow healing, inflammation and pain, and elevated blood pressure.
- There is also a medical test to measure something called “blood monomers.”
- The medical community has long known that excess fibrin presents a cardiac and stroke risk.
- And only recently, they acknowledged the link between excess fibrin and chronic systemic inflammation, *the true root cause of virtually every disease and painful condition known to man. Levels of c-reactive protein go up.*

Source: <https://losethebackpain.com/proteolyticenzymes/>

# Addendum: Food as a Source of Pain

- Certain foods can be seen as a source of pain. A book written by Dr. Peter Osborne has written a book about issues regarding grains, No grain, No pain as a possible cause of chronic pain. Nightshade vegetables can be a problem for people with arthritis (tomato, eggplant, potatoes, and peppers).
- Two, a food elimination diet can be used as a tool to see which foods do agree with you and which ones don't.
- Three, due to the accumulation of various toxic substances now found in our water, food, and air, all this can be playing a role in causing pain and other health issues.
- Four, nutritional deficiencies are common and needs to be considered as well.

Note: MSG for monosodium glutamate can trigger excitotoxicity in the brain, causing migraines. In the United States, the FDA allows MSG to be in “natural flavorings” up to 40%.

# Addendum: Glossary (part one of three)

- Biofeedback – It is a process whereby electronic monitoring of a normally automatic bodily function is used to train someone to acquire voluntary control of that function.
- Biomarkers – It is a measurable [indicator](#) of some biological state or condition.
- Blood monomers - A monomer is the basic unit that binds chemically to other molecules to form a polymer. For lipids, the monomers are glycerol and fatty acids. For proteins, the monomers are amino acids. For nucleic acids, the monomers are nucleotides which is made of a pentose sugar, a nitrogenous base and a phosphate group.
- Cognitive Behavioral Therapy – It is form of [psychotherapy](#) that treats problems and boosts [happiness](#) by modifying dysfunctional emotions, behaviors, and thoughts.

Source: Managing chronic pain in an age of addiction (2018) by AkhtarPurvez, MD. (Publisher: Rowman and Littlefield)

# Addendum: Glossary (part two of three)

- C-Reactive Protein – Those with high levels of this protein were found to have higher risk for stroke or heart attacks.
- Depression – There are two types, one is situation, based on the person's environment and the other is clinical depression where it is hidden and a factor in suicides. Depression does play a role in pain.
- Enzymes - Enzymes are, by definition, catalysts that enable molecules to be changed from one form into another. Digestive enzymes enable food to be broken down into nutrients in our bodies to produce energy, and repair and maintain our physical structure and function.
- Fibrin – Fibrin is a mesh that develops at the site of an injury to enable healing and then it dissolves. When it doesn't dissolve, it causes scar tissue.
- Microbiome – The role of our gut and the bacteria that inhabits in our gut would be worth exploring when it comes to pain issues as well as other issues.
- Natural Flavoring – Natural flavoring is found as an ingredient in a number of foods. The FDA allows MSG (monosodium glutamate) to be up to 40% MSG without it being specified. MSG has been found to trigger migraine headaches in sensitive individuals.

# Addendum: Glossary continued (part three of three)

- Naturopathic type of pain – It originates in the nerves.
- Nocioceptors type of pain- It originates in the skeletal system, muscles, tissues and organs.
- Pain management specialists – There are medical practitioners with MDs that specialize in pain treatment.
- Pain tolerance – What is painful to one person may not feel painful to another person.
- Pain indicators – There is really no specific test to measure pain levels like blood pressure meters. It is generally on a scale from one to ten.
- Proteolytic enzymes – There are enzymes that have a role in boosting the immune system as well as reducing pain levels.

# Addendum: Importance of Exercise

- Exercise benefits people of all ages. It becomes more essential as we age.
- Regular exercise and proper breathing can also address pain issues, reducing our pain.
- Exercise can release hormones that improve mood as well as cut down on pain.

# Addendum: Issues with conventional and drug approaches to pain relief

- The major issue with conventional and drug approaches to pain relief is their potential to cause harm, especially to the liver and the kidneys. It can cause death. We now have an opioid crisis in the United States.
- Most of these medications need to be used responsibly, including ones that are sold over the counter. They are basically for short term use and they are not to go over a certain number of pills or dosage within a specific time frame.
- Each one of us is biochemically unique. What may work for one person, may not work for someone else.

# Addendum: Kratom

- Kratom (*Mitragyna speciosa*) is a tropical evergreen tree from Southeast Asia and is native to Thailand, Malaysia, Indonesia and Papua New Guinea. Kratom, the original name used in Thailand, is a member of the Rubiaceae family. It has been used for centuries.
- The leaves of kratom are consumed either by chewing, or by drying and smoking, putting into capsules, tablets or extract, or by boiling into a tea. The effects are unique in that stimulation occurs at low doses and opioid-like depressant and euphoric effects occur at higher doses.
- Common uses include treatment of pain, to help prevent withdrawal from opiates (such as prescription **narcotics** or **heroin**), and for mild stimulation.
- Alkaloid and mitragynine content can vary in these plants, components responsible for therapeutic properties, boosting energy and manage pain.

Source: <https://www.drugs.com/illicit/kratom.html>

And [https://en.wikipedia.org/wiki/Mitragyna\\_speciosa](https://en.wikipedia.org/wiki/Mitragyna_speciosa)

And <https://superspeciosa.com/kratom/maeng-da-kratom/>

# Addendum: Kratom continued

- It needs to be noted that there is some controversy and issues regarding kratom and by the FDA.
- Reputable companies test kratom (plant version) for their content before placing it on the market. The contents can vary among these plants.

Source: <https://nccih.nih.gov/news/kratom>

And <https://superspeciosa.com/faqs/>

# Addendum: Medicinal Marijuana

- One, laws vary from state about medicinal marijuana. It is legal in the state of Maryland.
- Two, it can be used in Maryland for:
  - Patients with chronic or debilitating diseases or medical conditions who have been admitted to hospice or are receiving palliative care.
  - Patients with a chronic or debilitating disease whose symptoms include (or for which the treatment produces side effects that include) cachexia, anorexia, or wasting syndrome; severe or chronic pain; severe nausea; seizures; and/or severe or persistent muscle spasms.
  - Patients who are diagnosed with any condition that is severe, for which other medical treatments have been ineffective, and for which the symptoms “reasonably can be expected to be relieved” by the medical use of marijuana.
  - The Maryland State Commission specifically lists glaucoma and post-traumatic stress disorder as qualifying conditions.

Source: <https://www.baltimoresun.com/health/marijuana/bs-md-medical-marijuana-faq-20171207-story.html>

# Addendum: Nootropics

- Nootropics are a category of compounds that may be synthetic or not. They have the ability to improve one's cognitive abilities. Nootropics must be able to:
  - Enhance memory and learning ability
  - Help the brain function under disruptive conditions
  - Improve neuronal firing mechanisms
  - Lack any sedative, stimulant, or toxic effects
  - Protect the brain from harmful chemical damage
- Some of the nootropics are actually nutrients like melatonin and L-theanine. Nootropics calm the brain down as well as reduce the number of pain messages generated by the brain.
- The term 'nootropics' is relatively new. The name having been coined in 1972 by Romanian chemist Corneliu Giurgea to describe compounds that could 'turn the mind' (from Greek, *nous trepein*).

Source: <https://www.nootropics.com/introduction-to-nootropics/>

# Addendum: Other Types of Pain

- There are other types of pain other than acute and chronic. When it lasts longer than six months, it is considered to be chronic pain.
- Neuropathic pain – It results from damage or dysfunction to your nervous system and the nerves misfiring pain signals. Diabetes is a common cause of neuropathic pain.
- Nocioceptive pain – It is caused by stimulation of nociceptors which are pain receptors for tissue injury. These receptors are located throughout the body. It can be visceral or somatic.
  - Somatic – results from stimulation of pain receptors in your tissues
  - Visceral – results from injuries or damage to internal organs

Source: <https://www.healthline.com/health/types-of-pain#other-considerations>

# Addendum: Proteolytic Enzymes

- As we age, our levels of proteolytic enzymes decline. These enzymes play a major role in experiencing pain, especially arthritis and dissolving the fibrin.
- The following foods are high in proteolytic enzymes:
  - asparagus
  - fermented foods like kimchi, kefir and sauerkraut
  - ginger
  - kiwi
  - papaya
  - pineapple
  - yogurt

Source: <https://losethebackpain.com/proteolyticenzymes/>

# Addendum: Proteolytic Enzymes continued

- **Health benefits of proteolytic enzymes**
- **Fights inflammation and pain**
  - These enzymes bring nutrients and oxygen rich blood to help remove the metabolic waste that causes inflammation.
- **Eases sore muscles**
  - Proteolytic enzymes help reduce delayed onset muscle soreness. Studies have shown that they can improve recovery time and reduce overall muscle soreness.
- **Speeds up wound healing**
  - Bromelain and papain, two types of proteolytic enzymes, have wound healing properties and promote the growth of new tissue.
- **Helps regulate blood pressure**
  - Studies show that proteolytic enzymes eat and dissolve the excess fibrin that clog up your blood.
- **Boosts the immune system**
  - The proteolytic enzymes make your body's natural killer cells more potent. They break down pathogens that can interfere with normal immune function.
- **Kills viruses**
  - Systemic enzymes dissolve the fibrin, exposing the viruses, enabling your immune system to wipe them out. Proteolytic enzymes eat up the protective outer coating of a virus, called a capsid

Source: <https://losethebackpain.com/proteolyticenzymes/>

# Addendum: Proteolytic Enzymes continued

## Types of Proteolytic Enzymes

- There are digestive enzymes and systemic enzymes that break down excess fibrin. There are also plant based enzymes and animal based enzymes.
- Three digestive enzymes:
  - Pepsin
  - Trypsin
  - Chymotrypsin
- Other Enzymes
  - Bromelain
  - Pancreatin
  - Papain
  - Serratiopeptidase

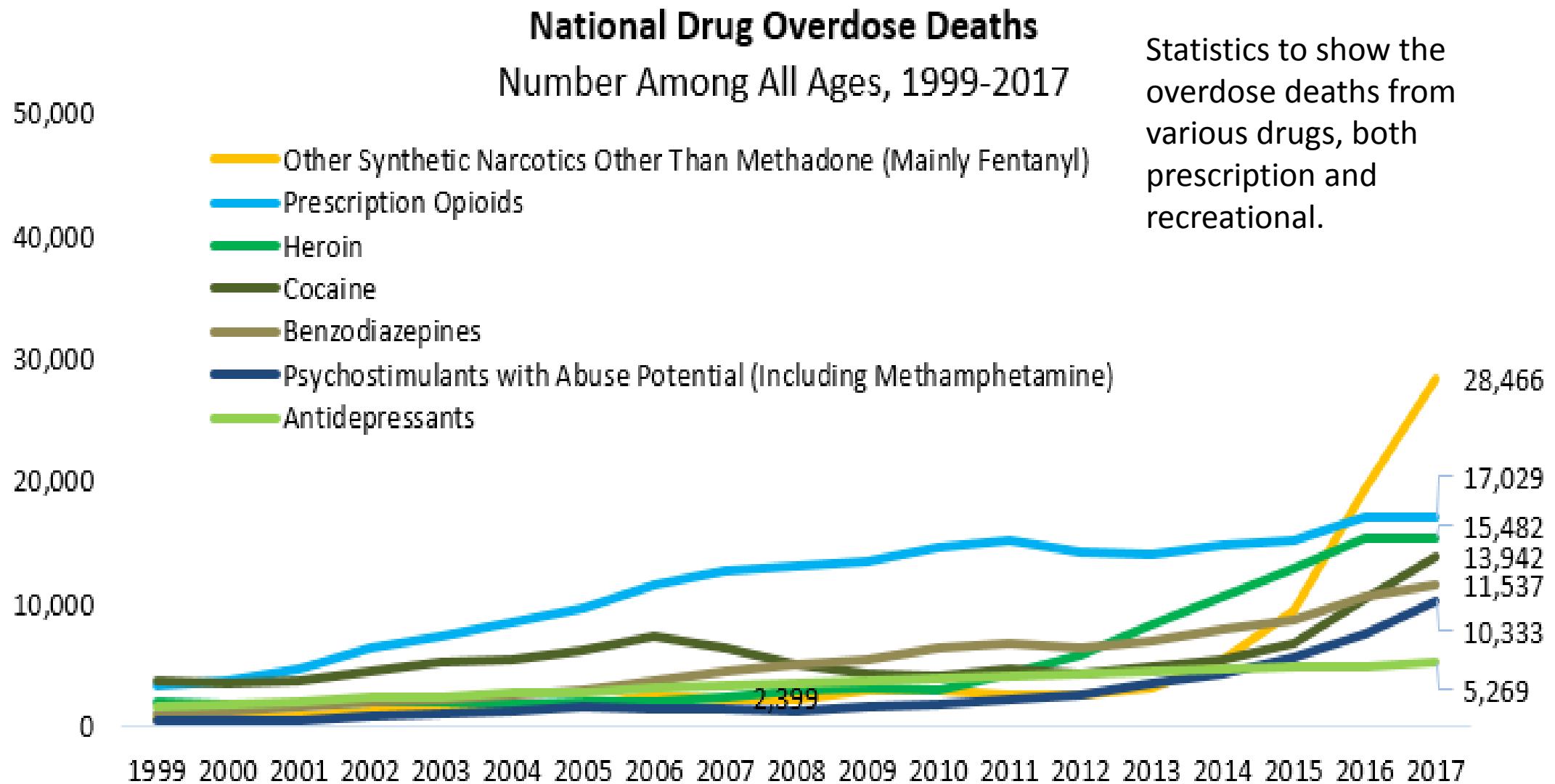
## Sources of Proteolytic Enzymes

- The stomach and pancreas create the proteases (breaks down protein into amino acids).
- Food is another source of enzymes.
- Enzyme supplements are available. Those taken with meals assist with digestion (digestive enzymes). Those taken between meals help the system (systemic).

Note: Enzymes are measured by HUT or DU, depending upon the enzyme. "hemoglobin units in a tyrosine base" is HUT and "dextrinizing units" for DU.

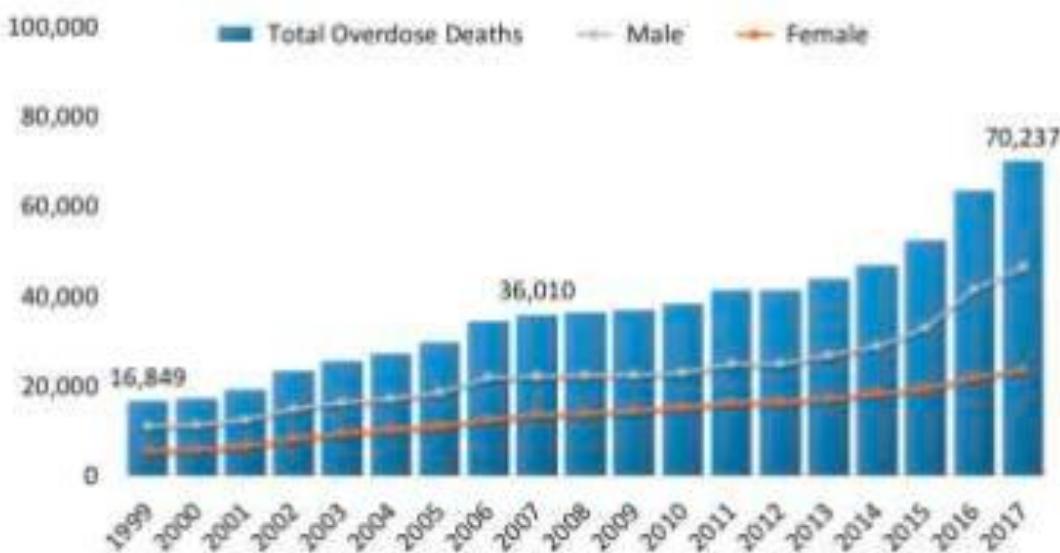
Source: <https://articles.mercola.com/sites/articles/archive/2018/03/05/proteolytic-enzymes-benefits.aspx>

and <https://www.healthline.com/nutrition/proteolytic-enzymes>



Source: <https://www.drugabuse.gov/related-topics/trends-statistics/overdose-death-rates>

Figure 1. National Drug Overdose Deaths  
Number Among All Ages, by Gender, 1999-2017



Source: <https://www.drugabuse.gov/related-topics/trends-statistics/overdose-death-rates>

Figure 1. National Drug Overdose Deaths—Number Among All Ages, by Gender, 1999-2017. More than 70,200 Americans died from drug overdoses in 2017, including illicit drugs and prescription opioids—a 2-fold increase in a decade. The figure above is a bar and line graph showing the total number of U.S. overdose deaths involving all drugs from 1999 to 2017. Drug overdose deaths rose from 16,849 in 1999 to 70,237 in 2017. The bars are overlaid by lines showing the number of deaths by gender from 1999 to 2017 (Source: CDC WONDER).

# Conclusion

- Given the current opioid crisis, it is merits everyone's concern. It is noted that more people suffer from pain than from any other condition.
- This opioid crisis did not occur overnight.
- The opioid crisis indicates the shortcomings of American health care, the patchwork coverage and gaps. It is most likely to be playing a major role in this drug crisis. It also indicates gaps in the United States regarding mental health issues.
- Furthermore, it behooves all of us, to assess treatment protocols and seek ones that are safer. In many cases, they are more effective.
- In dealing with pain, there are a number of approaches to treating pain. What works for one person will be most likely be different for another person. As we age, other issues come into play like declining levels of proteolytic enzymes and excess fibrin.
- It would make sense to assess nutritional deficiencies, toxic exposure overload, emotional well being and exercise as major factors in the current pain epidemic.

# Information about the authors

- Tamar Clarke has a master's degree in library science from the University of Pittsburgh and a master's degree in public administration from American University.
- April Huckabay has studied integrative health at Allegany College of Maryland with an AA degree, a Reiki master, Aroma Touch technician, and undertaken a number of classes on nutrition, yoga, and other independent classes. She teaches yoga and other classes.