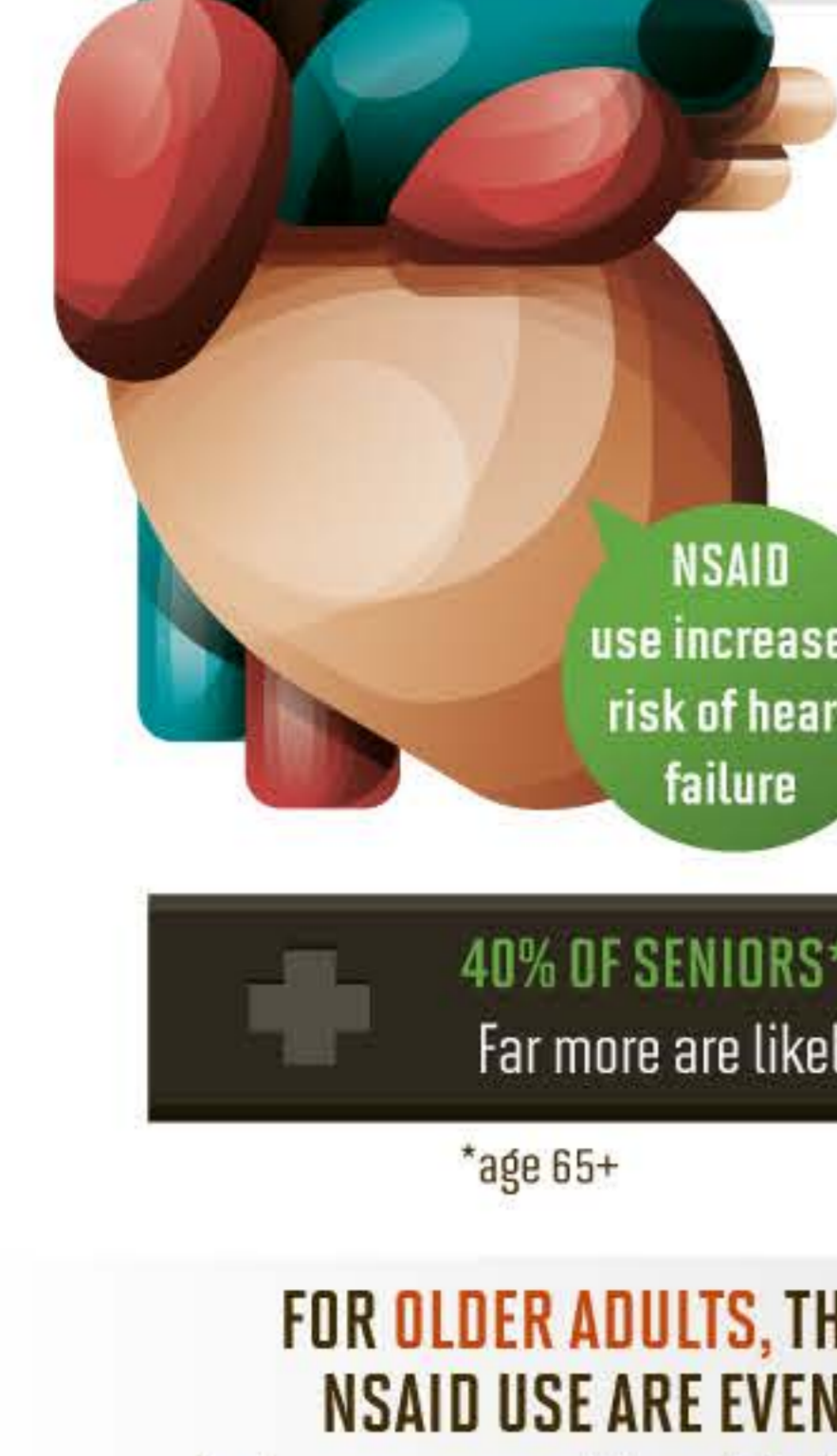


CBD AND THE FUTURE OF PAIN MANAGEMENT



1 IN 5 AMERICAN adults suffer from CHRONIC PAIN — Is our medicine helping us feel better?

The Problem of PAIN RELIEF



In 2005, the FDA released a warning **NON-ASPIRIN NSAIDS - LIKE IBUPROFEN AND NAPROXEN - INCREASE THE RISK OF HEART ATTACK AND STROKE**

10 years later, they doubled down, stating that risk of heart attack or stroke when taking NSAIDs

- ⚠ Can increase in the first weeks of use
- ⚠ May increase over time with prolonged use
- ⚠ Appears greater at higher doses
- ⚠ Is not limited to patients with heart disease or risk factors

40% OF SENIORS* FILL AT LEAST ONE NSAID PRESCRIPTION EACH YEAR
Far more are likely to use over-the-counter NSAIDs on a regular basis

*age 65+

FOR OLDER ADULTS, THE RISKS OF NSAID USE ARE EVEN GREATER

Each year among older adults, NSAID use causes:



41,000 hospitalizations



3,300 deaths



OLDER ADULTS TEND TO TAKE NSAIDS REGULARLY



Contributing to a greater risk of



Worsening the symptoms of

- Stroke or heart attack
- Acute renal failure
- Peptic ulcer disease
- Heart failure
- Hypertension



And interfering with the action of other medications, such as warfarin and systemic corticosteroids

COMPARED TO NSAIDS AND OTHER PAIN MEDICATIONS, CBD

- Effectively relieves pain and inflammation
- Has fewer, less severe side effects
- Doesn't cause users to build up a tolerance



CBD PROVEN PAIN RELIEF

CBD, OR CANNABIDIOL, IS AN ALL NATURAL, NON-INTOXICATING EXTRACT, DERIVED FROM HEMP OR MARIJUANA PLANTS

Current users of CBD choose it to treat:



While CBD is not a cure, mounting evidence shows **IT REDUCES PAIN AND INFLAMMATION IN A WIDE ARRAY OF HUMAN CONDITIONS**



CBD can relieve joint pain and inflammation — Without side effects

In a 2016 study, topical CBD gel was applied to rats with an inflamed knee joint for 4 consecutive days. After treatment, the rats exhibited:

- Reduced inflammation
- Improved mobility
- Normal behavior and activity level



CBD can reduce gastrointestinal inflammation and improve gut health

A 2010 study showed CBD reduced inflammation and improved motility in rats with induced colitis as well as, or better than, prescription medication. These findings suggest CBD may be used to treat GI disease in humans:

- Irritable bowel disease
- Ulcerative colitis
- Crohn's disease

CBD may relieve headaches and treat migraines

Growing evidence of CBD's ability to treat pain suggests it may help relieve and prevent headaches and migraines, though more research is needed

- Reduce pain
- Studies have shown cannabis to effectively treat migraines and chronic headaches

When used together for severe pain, CBD lessens THC's intoxicating effects

CBD may help treat chronic pain

CBD shows promise as a long term treatment for pain and inflammation

- Relieves pain and inflammation with minimal side effects
- Doesn't cause users to develop a tolerance

CBD can reduce nerve pain and muscle spasms

A 2007 study found that short term use of CBD can reduce nerve pain associated with conditions like multiple sclerosis (MS)

- Short-term use may reduce muscle spasms as well

CBD works by improving the function and balance of our bodies' signaling systems **IMPACTING PAIN PERCEPTION, INFLAMMATORY PROCESSES, AND IMMUNE RESPONSE**

How CBD TREATS PAIN

THE ENDOCANNABINOID SYSTEM

Cannabinoids naturally produced in the body are known as endocannabinoids



Receptors translate signals from endocannabinoids into actions

Plant-based cannabinoids can trigger the same receptors

New research suggests an endocannabinoid deficiency could be responsible for migraines, irritable bowel syndrome, and fibromyalgia — And **CBD COULD PLAY A KEY ROLE** in treating these painful conditions

CANNABINOID 1 RECEPTOR (CB1R)

Found primarily in the brain, regulates:



Learning, memory, and cognition



Mood, anxiety, and depression



Appetite, reward and addiction



Motor control and sleep

CB1R is primarily responsible for producing a "high" - BUT, unlike THC, **CBD ONLY WEAKLY BINDS TO CB1R**

Instead, CBD works by **ENHANCING THE EFFECTS OF OTHER SIGNALING MOLECULES AND RECEPTORS** throughout the brain and nervous system

N-Arachidonoyl-Ethanolamine (AEA), or "Anandamide"

- Endocannabinoid that regulates pain, mood, cognition
- An imbalance of anandamide can mimic the psychoactive effects of THC
- Connected to feeling of "bliss" triggered by
 - Eating chocolate
 - "Runner's high"
 - Meditation

Anandamide suppresses pain initiation — CBD stops anandamide from breaking down, increasing its levels throughout the body

Transient Receptor Potential Vanilloid 1 (TRPV1)

- Receptor that regulates body temperature, affecting inflammation and pain perception
- Sensitive to inflammatory agents, contributing to hypersensitivity
- Likely culprit in inflammatory pain conditions, such as
 - Inflammatory bowel disease
 - Bladder inflammation
 - Cancer pain

In 2018, a study found that repeated treatment with **LOW-DOSE CBD RELIEVES PAIN BY ACTIVATING TRPV1**

OF THOSE WHO TRIED CBD, MOST CONTINUE USING IT



Acetaminophen (Tylenol) affects anandamide and TRPV1 in a similar manner to CBD, but has little effect on inflammation

NO ONE WANTS TO SUFFER IN PAIN, CAN CBD HELP YOU?

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