Physician Therapeutics®

A Revolutionary New Approach to Chronic Pain

1. Pain is an enormous medical and societal problem
2. Pain has a very high human and financial cost
3. Pain solutions have awful side effects
4. NSAID use has a serious dark side
5. **Theramine is a revolutionary new tool for safely managing chronic pain**

1

Pain is an enormous medical and societal problem

Pain is a problem.

Physical pain causes suffering, drug use and lost productivity.

100+ million

Americans are affected daily or fully 1/3 of the population

$635+ billion

per year costs society alone chronic pain

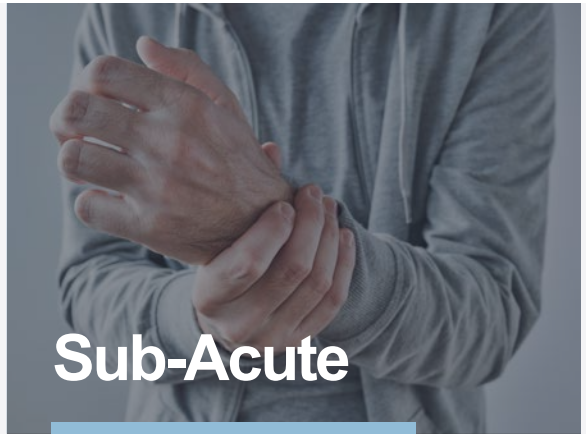
1. Dahlhamer J, Lucas J, Zelaya, C, et al. Prevalence of Chronic Pain and High-Impact Chronic Pain Among Adults - US, 2016. MMWR Morb Mortal Wkly Rep 2018;67:1001–1006
2. The economic costs of pain in the United States J Pain. 2012 Aug; 13(8):715-24. Link

Three types of pain.

Lasts up to 30 days

Related to damage

Biological utility for healing



Lasts 1-3 months

Related to damage

Protection from further injury

Lasts more than 3 months

Not consistently related to damage

No biologic utility or protection

Pain hurts the brain.

Chronic pain changes brain chemistry and function, adversely effecting the cortex and thalamus regions of the brain.

Gray matter atrophy as a result of chronic pain is

5-11% per year

0.5% normal aging

Chronic pain atrophy is equivalent to **10-20** years of aging

[Source(s) Placeholder].

Chronic pain puts limits on life.

- ✕ Restrictions in mobility
- ✕ Restrictions in daily activities
- ✕ Poor perceived health
- ✕ Reduced quality of life
- ✕ Anxiety and Depression
- ✕ Opioid dependence

60%

of patients with chronic pain meet criteria for depression

1. Schappert SM, Burt CW. Ambulatory care visits to physician offices, hospital outpatient departments, and emergency departments. Vital Health Stat 13 2006;13:1–66. Link
2. Gureje O, Von Korff M, Simon GE, Gater R. Persistent pain and well-being. A World Health Organization study in primary care. JAMA 1998;280:147–51. Link, Link
3. Smith BH, Elliott AM, Chambers WA, Smith WC, Hannaford PC, Penny K. The impact of chronic pain in the community. Fam Pract 2001;18:292–9. Link, Link

Chronic pain kills.

Study | Wednesday, November 29, 2017

61% of Opioid-Related Deaths Linked to Chronic Pain Diagnosis[1]

In a study that underscores the need to rethink pain treatment in the US, researchers have found that more than 6 out of 10 individuals who died of an opioid-related cause had received a diagnosis for a chronic noncancer pain condition within the preceding year. The same group was also more likely to have been diagnosed with psychiatric disorders and prescribed psychotropic medications--including benzodiazepines, which can increase the risk of death when combined with opioids.

The study, published in the *American Journal of Psychiatry* (abstract only available for free), focused on 13,089 opioid-related deaths among Medicaid patients under 65 years old. Researchers divided the decedents into 2 groups—those who had received a chronic noncancer pain diagnosis in the year preceding death, and those who didn't—and looked at other clinical diagnoses, filled medical prescriptions, and nonfatal poisonings during the 12 months preceding death as well as 30 days before death.

Among the findings:

- Out of the 13,089 decedents included in the study, 61.5% were diagnosed with a chronic pain condition in the year preceding death. Within the chronic pain group, 59.3% were diagnosed with back pain, 24.5% with headaches, and 6.9% with neuropathies. Authors write that "virtually all the descendants in the chronic pain group were also diagnosed with other bodily pain conditions." Decedents in the chronic pain group were more likely to be female and white
- Overall, 66.1% of descedents filled opioid prescriptions during the last 12 months, and 61.6% filled prescriptions for benzodiazepines—the class of drugs typically used to treat anxiety. During the last 30 days of life, descendants diagnosed with chronic pain were more likely to fill 1 or more prescriptions for opioids (49%) and benzodiazepines (52.1%) than the nonpain group (17.2% and 26.6%, respectively).
- Decedents with a pain diagnosis were about twice as likely as those without a diagnosis to have experienced a nonfatal overdose during the 12 months prior to death.
- In the chronic pain group, 45.6% of the fatal opioid poisonings were from natural and semisynthetic opioids, and 16.7% from other synthetic opioids. Among nonpain descendants the rates were 39% and 12.2%, respectively.
- Within the last 12 months of life, the chronic pain group was more likely than the nonpain group to receive a mental health diagnosis, including drug use disorder (40.8% compared with 22.1%), depression disorder (29.6% compared with 13%), and anxiety disorder (25.8% compared with 8.4%). Authors note that although a diagnosis of substance use disorder was relatively common among both groups, a specific diagnosis of opioid use disorder was not—only 14.7% in the pain group, and 11.8% in the nonpain group.

Authors highlighted the prevalence of opioid prescriptions within the last 30 days of life as a particular concern, pointing out that the 36.8% average far exceeds the 8.8% average among all Americans for filling a prescription for an analgesic over a 30-day period. "This pattern raises the possibility that health care professionals may frequently be proximal sources of opioids in fatal overdoses," they write.

The researchers also asserted that given the high rate of mental health diagnoses, particularly among the pain group, health providers need to be particularly wary of prescribing benzodiazepines with opioids. They write that physicians should limit opioid and benzodiazepine coprescribing "to patients for whom alternative strategies have proven inadequate, carefully monitoring for sedation and respiratory depression, and limiting such coprescription to the minimum clinically required dosage and duration."

The study lends support to the idea that reliance on opioids for noncancer pain treatment is helping to fuel the opioid crisis in the US.

1. Study: 61% of Opioid-Related Deaths Linked to Chronic Pain Diagnosis; Link

Chronic pain kills.

Study | The American Journal of Psychiatry, November 2017

Mark Olfson, Melanie Wall, Shuai Wang, Stephen Crystal, Carlos Blanco
PMID: 29179577, PMCID: PMC5972045

Service Use Preceding Opioid-Related Fatality[1]

Abstract

Objective: This study analyzed health service patterns before opioid-related death among nonelderly individuals in the Medicaid program, focusing on decedents with and without past-year diagnoses of noncancer chronic pain.

Methods: The authors identified opioid-related descendants, age ≤64 years, in the Medicaid program and characterized their clinical diagnoses, filled medication prescriptions, and nonfatal poisoning events during the 30 days and 12 months before death. The study group included 13,089 opioid-related deaths partitioned by presence or absence of chronic noncancer pain diagnoses in the last year of life.

Results: Most descendants (61.5%) had received clinical diagnoses of chronic noncancer pain conditions in the last year of life. As compared with decedents without chronic pain diagnoses, those with these diagnoses were significantly more likely to have filled prescriptions for opioids (49.0% vs 17.2%) and benzodiazepines (52.1% vs 26.6%) during the last 30 days of life, while diagnoses of opioid use disorder during this period were uncommon in both groups (4.2% vs 4.3%). The chronic pain group was also significantly more likely than the nonpain group to receive clinical diagnoses of drug use (40.8% vs 22.1%), depression (29.6% vs 13.0%) or anxiety (25.8% vs 8.4%) disorders during the last year of life.

Conclusions: Persons dying of opioid-related causes, particularly those who were diagnosed with chronic pain conditions, commonly received services related to drug use disorders and mental disorders in the last year of life, though opioid use disorder diagnoses near the time of death were rare.

Study | Epidemiology, July 2022

Inoue, Kosukea; Ritz, Beateb; Arah, Onyebuchi A

Causal Effect of Chronic Pain on Mortality Through Opioid Prescriptions: Application of the Front-Door Formula[2]

Abstract

Background: Chronic pain is the leading cause of disability worldwide and is strongly associated with the epidemic of opioid overdosing events. However, the causal links between chronic pain, opioid prescriptions, and mortality remain unclear.

Methods: This study included 13,884 US adults aged ≥20 years who provided data on chronic pain in the National Health and Nutrition Examination Survey 1999–2004 with linkage to mortality databases through 2015. We employed the generalized form of the front-door formula within the structural causal model framework to investigate the causal effect of chronic pain on all-cause mortality mediated by opioid prescriptions.

Results: We identified a total of 718 participants at 3 years of follow-up and 1260 participants at 5 years as having died from all causes. Opioid prescriptions increased the risk of all-cause mortality with an estimated odds ratio (OR) (95% confidence interval) = 1.5 (1.1, 1.9) at 3 years and 1.3 (1.1, 1.6) at 5 years. The front-door formula revealed that chronic pain increased the risk of all-cause mortality through opioid prescriptions; OR = 1.06 (1.01, 1.11) at 3 years and 1.03 (1.01, 1.06) at 5 years. Our bias analysis showed that our findings based on the front-door formula were likely robust to plausible sources of bias from uncontrolled exposure–mediator or mediator–outcome confounding.

Conclusions: Chronic pain increased the risk of all-cause mortality through opioid prescriptions. Our findings highlight the importance of careful guideline-based chronic pain management to prevent death from possibly inappropriate opioid prescriptions driven by chronic pain.

1. Service Use Preceding Opioid-Related Fatality; Link
2. Causal Effect of Chronic Pain on Mortality Through Opioid Prescriptions: Application of the Front-Door Formula; Link

Pain costs a fortune.

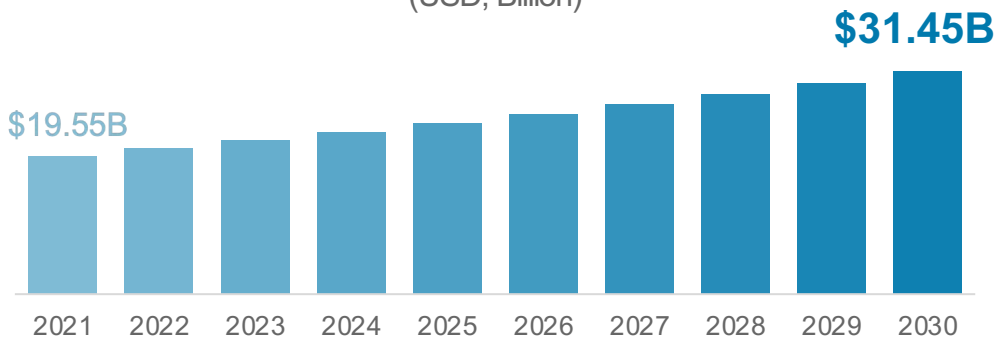
8% of prescriptions worldwide are for NSAIDS[1]

Global pain management drugs market size is expected to increase from $71 billion in 2021[2] to

$100 billion by 2030[3]

Non-steroidal Anti-inflammatory Drugs Market Size[4]

(USD, Billion)



$35 billion
Healthcare costs

+

$15 billion
Criminal justice cost

+

$92 billion
Lost productivity

=

$142 billion
Annual cost for opioid misuse, dependence and overdose[5]

1. Gastroduodenal mucosa and dyspeptic symptoms in arthritic patients during chronic nonsteroidal anti-inflammatory drug use; Link
2. Global Pain Management Drugs Market, By Drug Class, By Indication, By Pain Type, By Drug Type, By Distribution Channel, Estimation & Forecast, 2017 - 2030 January 2022; Link
3. The Worldwide Pain Management Drugs Industry is Expected to Reach $99.9 Billion by 2030; Link
4. Non-steroidal Anti-inflammatory Drugs Market Size; USD 31.45 Billion by 2030; Link
5. The High Price of the Opioid Crisis. (2021). The Pew Charitable Trusts.; Link

4

Pain is an enormous medical and societal problem

NSAIDs have a dark side.

GI damage

Kidney Damage

Liver Damage

Hearing Loss

Thrombosis

Male Fertility

Joint Damage

Brain Bleeding

Anaphylaxis

Ironically...

Chronic Pain

Gastrointestinal damage.

16,500 deaths

Related to NSAIDs annually. NSAID reported mortality in the United States is generally linked to NSAID-associated GI bleeding.[1]

This is equivalent to the population of Barrington, RI.

107,000 patients

hospitalized annually for nonsteroidal anti-inflammatory drug (NSAID)-related gastrointestinal (GI) complications each year.[2]

5 to 7x

increased risk of peptic ulcer disease in first 3 months of treatment from NSAIDs.

1. Do NSAIDs cause more deaths than opioids? Pract Pain Manag. 2013;13(10). /Link
2. Non-steroidal anti-inflammatory drugs and the gastrointestinal tract. Royal College of Physicians Clinical Medicine 2021 Mar; 21(2): 131–134. /Link

Kidney damage.

26%

increase of rapid progression chronic kidney disease among elderly subjects after high dose NSAID exposure.[1]

18% and 32%

increase in the risk of chronic kidney disease in subjects taking NSAIDs for 1 to 89 days and increase in the risk of CKD in hypertension subjects taking NSAIDs for more than 90 days compared with subjects not taking NSAIDs.[2]

51%

increased risk of renal cell carcinoma with longer duration of non-aspirin NSAID use associated with increasing risk after regular use of non-aspirin NSAIDs.[3]

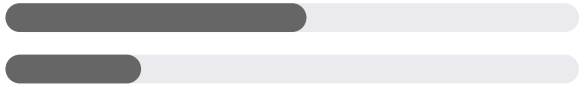
1. NSAID Use and Progression of Chronic Kidney Disease / AJM online clinical research study, volume 120, issue 3, p280.E1-280.E7, March 01, 2007. / Link
2. Use of Nonsteroidal Anti-Inflammatory Drugs and Risk of Chronic Kidney Disease in Subjects With Hypertension / Hypertension. 2015;66:524–533. / Link
3. Prospective evaluation of analgesic use and risk of renal cell cancer / Archives of Internal Medicine (2011;171:1487-1493). / Link

Liver damage.

30,000 patients

having to be admitted to hospitals every year for treatment of acetaminophan liver toxicity. Acetaminophen, one of the most utilized NSAID analgesic alternatives is the most common cause of acute liver failure in the US.[1]

50% and 20%



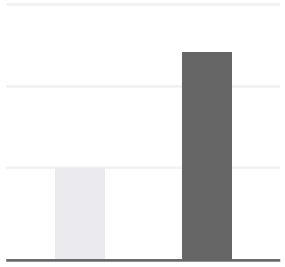
of overdose-related acute liver failure and of the liver transplant cases in the US are attributed to actaminophen (APAP).[2]

Second

Acetaminophen induced liver toxicity is the second most common cause of liver transplantation worldwide and the most common cause of liver transplantation in the US.[3]

1. Public awareness of acetaminophen and risks of drug induced liver injury: Results of a large outpatient clinic survey. PLoS ONE 15(3): e0229070.; Link
2. Acetaminophen-Induced Hepatotoxicity: a Comprehensive Update; J Clin Transl Hepatol. 2016 Jun 28; 4(2): 131–142.; Link
3. Acetaminophen Toxicity: Continuing Education Activity 2022; Link

Joint damage.



2.4x increased rate

of progression for hip osteoarthritis associated with long-term use of certain NSAIDs. The rate is a threefold increase in progression of knee osteoarthritis.[1]

50% increase

of getting a hip replacement due to primary osteoarthritis linked with NSAID usage during a two year period. (OR = 1.5 (95% CI 1.0 to 2.4))[2]

Could NSAIDs Somehow be Making OA Worse?

Barbara Brody

(OA) pain and stiffness is commonly treated with (NSAIDs), such as aspirin, ibuprofen, and naproxen. Although these drugs are meant to ease OA symptoms and not stop OA from progressing, no one would expect that these medications might actually make the condition worse — until now.

NSAIDS CAUSE OSTEOARTHRITIS

Numerous scientific studies have shown that patients who use NSAID to treat osteoarthritis have a faster rate of cartilage breakdown that leads to the need for joint replacements. It is the massive use of these medications in patients with OA during the past forty years that has lead to the rapid rise in the need for hip and knee replacements. Between 1997 and 2005 the number of knee surgeries climbed by 69% from 328,000 to 555,800 and hip replacements rose 32% from 290,000 to 383,500. During this time period, spinal fusion surgeries also increased by 73% from 202,100 procedures to 349,000 per year.

The Acceleration of Articular Cartilage Degeneration in Osteoarthritis by Nonsteroidal Anti-inflammatory Drugs

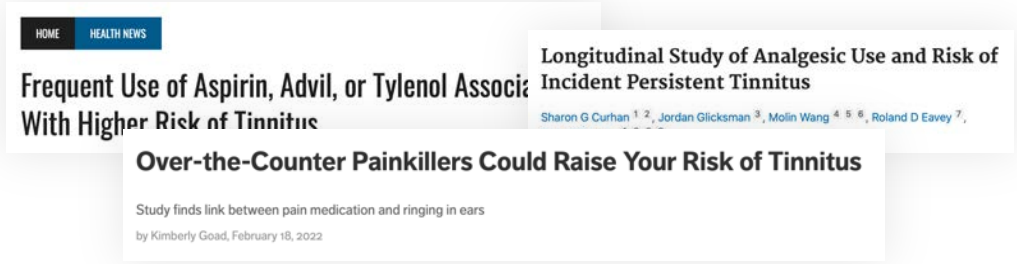
By Ross A. Hauser, MD

1. Long-term use of the NSAID diclofenac was associated with a more than twofold increase in radiologic progression of hip osteoarthritis and a threefold increase in progression observed in the knee. Arthritis Rheum. 2005 Oct;52(10):3137-42. doi: 10.1002/art.21357./ Link
2. Predictive factors of total hip replacement due to primary osteoarthritis: a prospective 2 year study of 505 patients. Ann Rheum Dis. 2005 Jul; 64(7): 1028–1032. / Link

Hearing loss.

Almost 20%

higher risk of tinnitus with frequent use of NSAIDs, acetaminophen and COX-2 inhibitors.[1]



Men who used NSAIDs regularly for four or more years were **33% (18–49%)** more likely to develop hearing loss than those who did not use NSAIDs regularly. Additionally, the risk of four or more years of regular acetaminophen use was also **33% (14–56%).** Lastly, those who used aspirin regularly for 1-4 years were **28%** more likely to develop hearing loss than those who did not use aspirin regularly.[2]

For men younger than age 50 years, the risks for hearing loss increased even further (**33%** more likely to develop hearing loss for regular aspirin users, **61%** more likely for regular NSAID users and **99%** more likely to develop hearing loss for regular acetaminophen users).[2]

In a study that reviewed analgesic use and hearing loss in women, ibuprofen increased risk for hearing loss by **13%** if used 2–3 days/week, **21%** if used 4–5 days/week and **24%** if used ≥6 days/week compared with use less than once per week.[3]

1. Longitudinal Study of Analgesic Use and Risk of Incident Persistent Tinnitus; Journal of General Internal Medicine volume 37, pages3653–3662 (2022).; Link
2. Analgesic Use and the Risk of Hearing Loss in Men; American Journal of Medicine VOLUME 123, ISSUE 3, P231-237 (2010).; Link
3. Analgesic Use and the Risk of Hearing Loss in Women; Am J Epidemiol. 2012 Sep 15; 176(6): 544–554.; Link

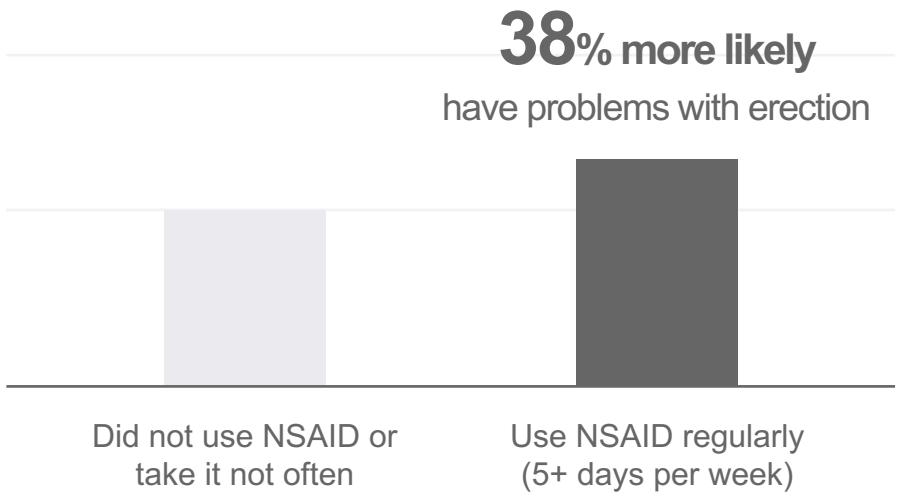
Venous thromboembolism.

Significant association between NSAID use and VTE, with an overall 80% increased risk compared with subjects who did not use NSAIDs.[1]

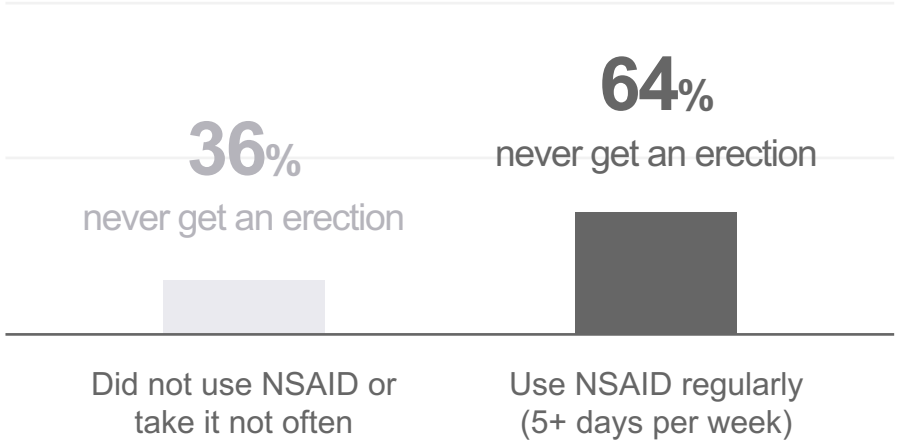
1. Non-steroidal anti-inflammatory drugs and risk of venous thromboembolism: a systematic review and meta-analysis; Rheumatology, Volume 54, Issue 4, April 2015, Pages 736–742.; Link

Reduced male fertility.

Men from 45 to 69 years of age who took NSAIDs[1,2]

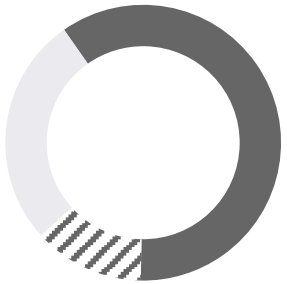


Men who took painkillers[3]
(including acetaminophen)



1. Study: Regular Use of Painkillers Linked to ED; Medically Reviewed by Laura J. Martin, MD on March 03, 2011 WebMD; Link
2. Study: Nonsteroidal anti-inflammatory drug users at greater risk of developing erectile dysfunction; May 01, 2011 Urology Times; Link
3. Impotence more common in men who pop painkillers; Reuters March 2, 2011; Link

Brain bleeding.



60-73% increased

brain bleeding risk after using of anti-depressants in combination with NSAIDs compared with the use of antidepressants alone.

90% increased risk

for brain bleeding when patients were taking 2 or more antidepressants with NSAIDS.

Study | Ann Pharmacother, August 2021

Po-Cheng Hou, Fang-Ju Lin, Shin-Yi Lin, Tzung-Jeng Hwang, Chi-Chuan Wang
PMID: 33305585

Risk of Intracranial Hemorrhage With Concomitant Use of Antidepressants and Nonsteroidal Anti-inflammatory Drugs: A Nested Case-Control Study[1]

Abstract

Background: Whereas previous studies found that concomitant antidepressant and nonsteroidal anti-inflammatory drug (NSAIDs) use may increase the risk of gastrointestinal bleeding, either drug alone increases the risk of intracranial hemorrhage (ICH).

Objective: To assess the risk for ICH in patients on concomitant treatment with antidepressants and NSAIDs.

Methods: This was a nested case-control study using national insurance claims data in Taiwan between 2005-2013. Drug exposure was measured and compared during 3 time windows: 1-30, 31-60, and 61-90 days before the index date, which is the date of the ICH event. Both traditional and newer-generation antidepressants were considered in this study.

Results: Patients exposed to both antidepressants and NSAIDs 1 to 30 days before the index date presented a 50% increased odds of developing ICH (OR: 1.53; 95% CI: 1.31-1.80) compared with patients receiving antidepressants alone. Specifically, the concomitant use of nonselective NSAIDs and antidepressants increased these odds compared with antidepressants alone (OR: 1.56; 95% CI: 1.31-1.84), but using a selective cyclooxygenase-2 inhibitor with antidepressant did not alter ICH risk. Regarding antidepressant class, newer-generation antidepressants generally increase the odds of developing ICH by 60% when used concomitantly with NSAIDs.

Conclusion and relevance: Our results suggested that the concomitant use of antidepressants and NSAIDs was associated with an increased odds of developing ICH. NSAIDs, especially nonselective NSAIDs, and serotonergic antidepressants played an important role in this risk. Given the prevalent use of these 2 classes of drugs, this potential drug interaction deserves more attention.

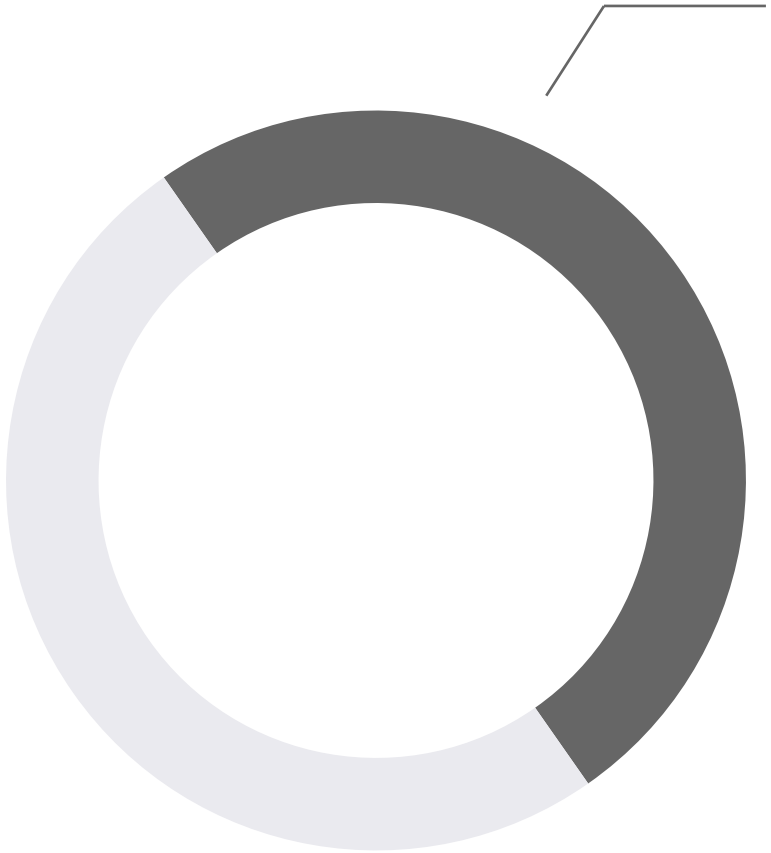
1. Risk of Intracranial Hemorrhage With Concomitant Use of Antidepressants and Nonsteroidal Anti-inflammatory Drugs; Link

Anaphylaxis.

In a comprehensive study of anaphylactic reactions, almost 50% of were caused by nonsteroidal anti-inflammatory drugs (NSAIDs).

NSAIDs Are a Common Trigger of Drug-induced Anaphylaxis

June 19, 2014
Andrew Smith



50%

of anaphylactic reactions were caused by NSAIDs

1. NSAIDs Are a Major Cause of Anaphylaxis-Related Emergency Department Visits; NEJM Journal Watch September 16, 2014; Link
2. Nonsteroidal Anti-Inflammatory Drugs are Major Causes of Drug-Induced Anaphylaxis; Journal of Allergy and Clinical Immunology. Volume 2, Issue 4, P414-420, July 01, 2014.; Link

...ironically, Chronic pain.

Early treatment with a steroid or nonsteroidal anti-inflammatory drug (NSAID) led to prolonged pain (duration up to 10-fold) despite providing analgesic relief in the short term in mouse models. Prolongation of pain was not observed with other analgesics

10x longer

These findings were corroborated by a separate study of 500,000 individuals in the United Kingdom that found people who used anti-inflammatory medicines for pain relief were more likely to have pain two to ten years later (which was not observed in people who took acetaminophen or anti-depressants).

1. New Side Effects of Popular Medicines Discovered: Anti-Inflammatory Drugs Could Cause Chronic Pain; SciTechDaily Oct. 23 2022.; Link
2. Acute inflammatory response via neutrophil activation protects against the development of chronic pain; Science Translational Medicine 11 May 2022 Vol 14, Issue 644.; Link

Acetaminophen carries long term risk.

An observational study revealed an increase in relative mortality among those who took acetaminophen, compared with those who did not take it, by...

63%

Long-Term Acetaminophen Use and Health Risks

Analysis of research says it's 'not a benign drug' if used long term and in larger doses

Written by WebMD Editorial Contributors

1. Long-Term Acetaminophen Use and Health Risks; WebMD March 2, 2015; Link
2. Paracetamol: not as safe as we thought? A systematic literature review of observational studies; Annals of Rheumatic Diseases Volume 75, Issue 3.; Link

5

Theramine is a revolutionary new tool for safely managing chronic pain

Theramine®:

A Better Solution for Chronic Pain

Opioids

Dangerous

- Epidemic – dependence, side effects
- 93,000 deaths from overdose 2020
- Next best option NSAIDs

NSAIDs

Side Effects & Risks

- Ibuprofen, Naproxen
- Side effects
- Often do not provide adequate pain relief
- Over 65 at risk population serious side effects
- Medical food suggested as adjacent / alternative for pain management

Theramine®

Safe & Effective:
A Nutritional Approach to Pain

- ✓ Safe and effective long-term use
- ✓ Human clinical trial data
- ✓ Pain management
- ✓ Address nutritional needs of chronic pain
- ✓ Example of well care

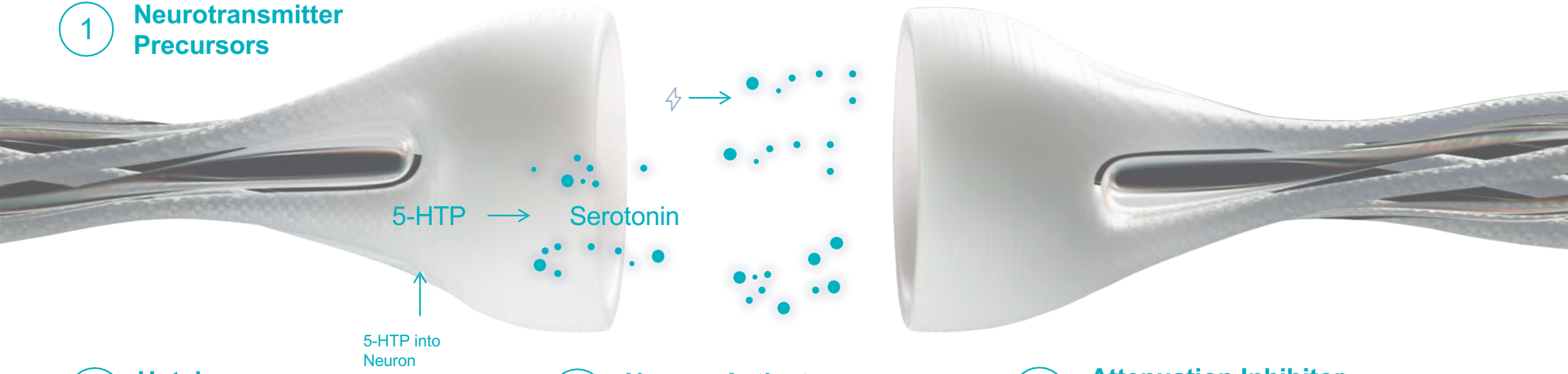
Powered by patented, clinically proven messenger Amino Acid™ Technology.

- Micro Dosing
- Improve Efficacy
- Superior Absorption
- Treatment Resistance Prevention

1 Neurotransmitter Precursors

3 Adenosine Brake Antagonist

Allows neuron to keep firing



2 Uptake Stimulator

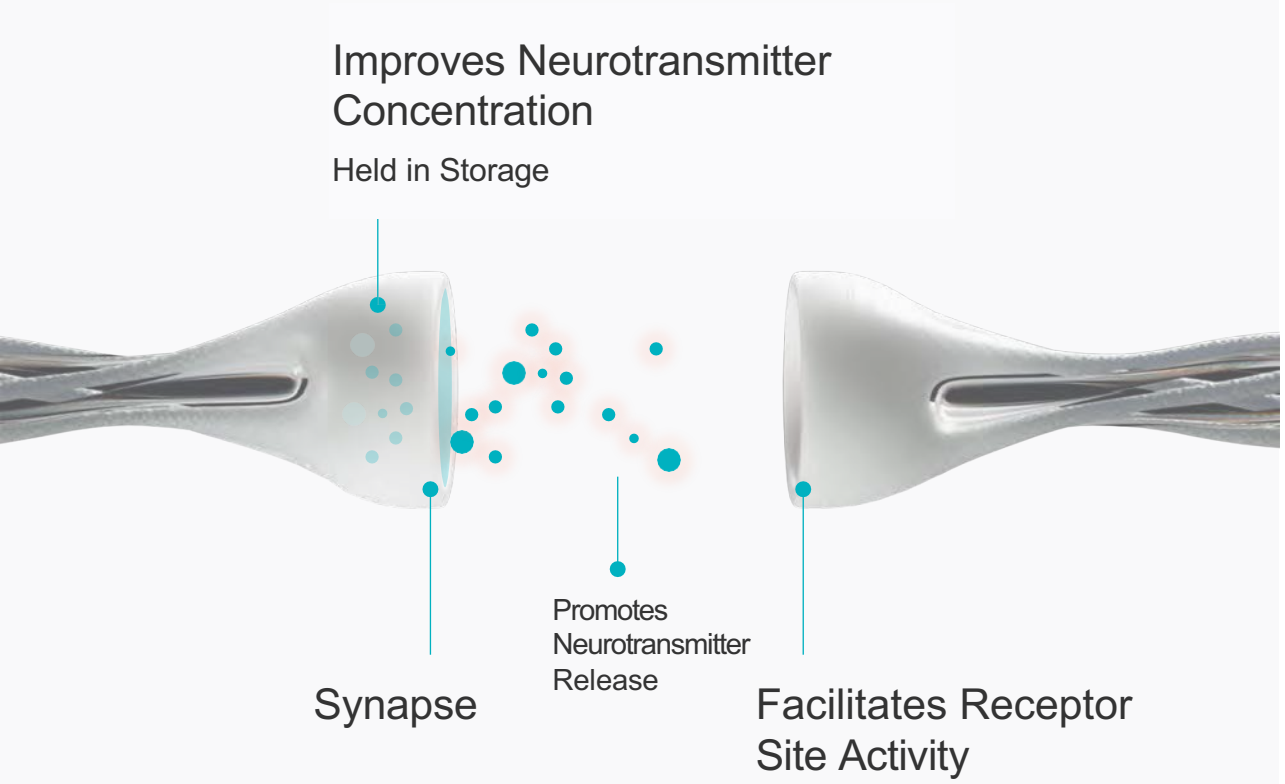
4 Neuron Activator

Promote neurotransmitter elease

5 Attenuation Inhibitor

Protects neuron from oxidative stress and damage

How Theramine® Works.



Working with the Nervous System

The pharmacodynamic properties of Theramine® are directly related to its ability to increase key neurotransmitter precursors which modulate neurotransmitter systems that are responsible for mitigating pain and inflammation.

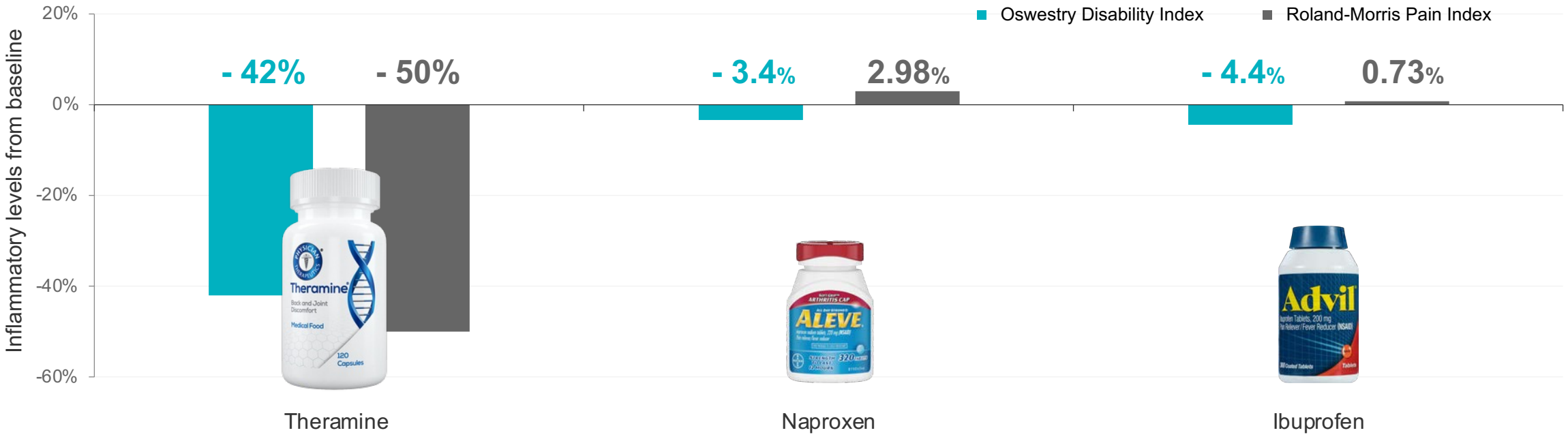
Gastrointestinal Protection

Theramine® assists with providing GI protection via the production of Nitric Oxide (NO) by increasing gastric mucus and bicarbonate secretion, inhibiting gastric acid secretion and is known to support intestinal barrier integrity as well.

NSAIDs vs. Theramine®
for Chronic Pain Management

Data From Double-Blind Human Randomized Control Trials

Reduction Indicates Improvement

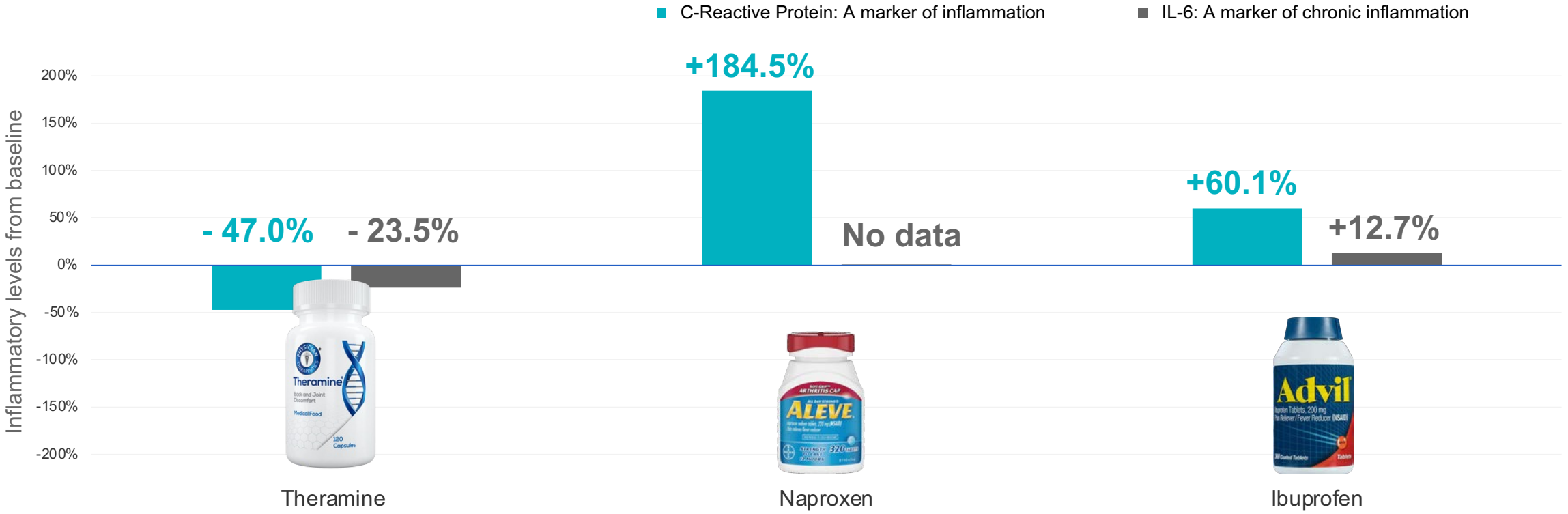


In a 28 day double blind, randomized controlled, multicenter trial of 127 subjects with chronic established back pain, subjects taking Theramine alone and as an adjuvant to naproxen experienced a statistically significant reduction in pain compared to once daily naproxen. Improvements shown with Theramine were statistically significant over both Naproxen and Ibuprofen.

NSAID vs. Theramine® Inflammatory Measures

Data From Double-Blind Human Randomized Control Trials

Reduction Indicates Improvement



Double blind multicenter trial of 127 with chronic established back pain, a marked decrease in CRP was measured among subjects taking Theramine compared to subjects taking ibuprofen (400mg) once daily. Improvements shown with Theramine were statistically significant over both Naproxen and Ibuprofen.

Why does Theramine® lower inflammation markers alone and with NSAIDs?

Theramine® contains multiple anti-inflammatory agents, including L-Arginine which stimulates nitric oxide production

NSAIDs like ibuprofen and naproxen inhibit Cox1 and Cox 2 which reduces the amount of protective prostaglandins in the GI tract, increasing risk of damage to the GI tract

Nitric oxide:

- Has prostaglandin-like protective mechanisms that increase mucus production and helps improve blood flow to the intestinal mucosa that promotes mucosal healing
- Mediates components of mucosal defense - stimulates mucous secretion in the gut, promotes healing and mucosal blood flow
- Performs many of the same GI protective functions as prostaglandins

Theramine® vs. Pharmaceuticals

Theramine®	Dangerous Side Effects	✓	No Side Effects
	High Cost	✓	Low Cost
	Low Efficacy	✓	High Efficacy
NSAIDs	Dangerous Side Effects		No Side Effects
	High Cost		Low Cost
	Low Efficacy		High Efficacy
Opioids	Dangerous Side Effects		No Side Effects
	High Cost		Low Cost
	Low Efficacy		High Efficacy

Theramine® as first-line treatment for people over 65.

Efficacy

More efficacious than ibuprofen and naproxen without the side effects of NSAIDs and no known contraindications

Side Effects

No reported side effects, hospitalizations, or deaths after nearly 20 years of clinical and commercial use

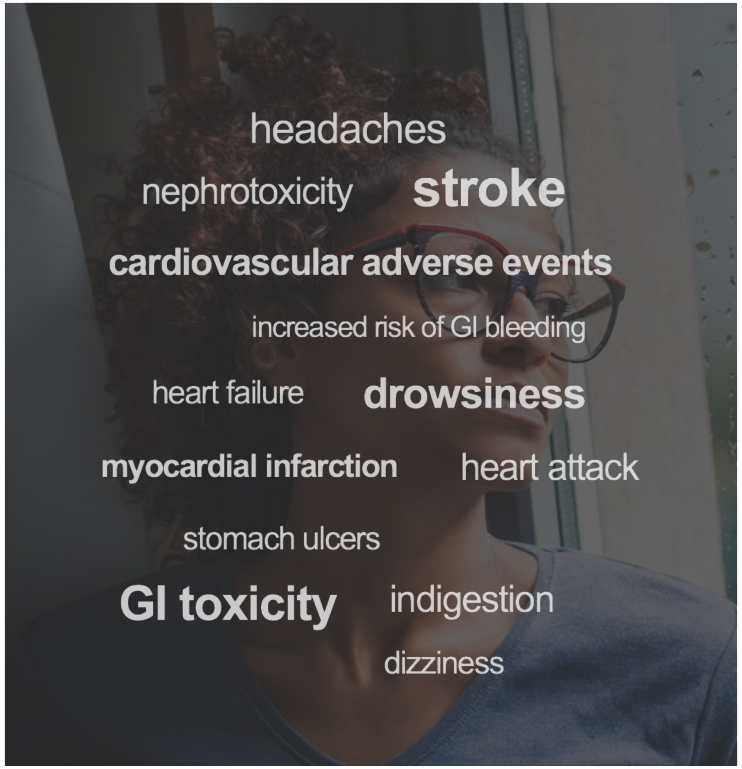
Adjuvant Therapy

Allowing lower dose with increased efficacy

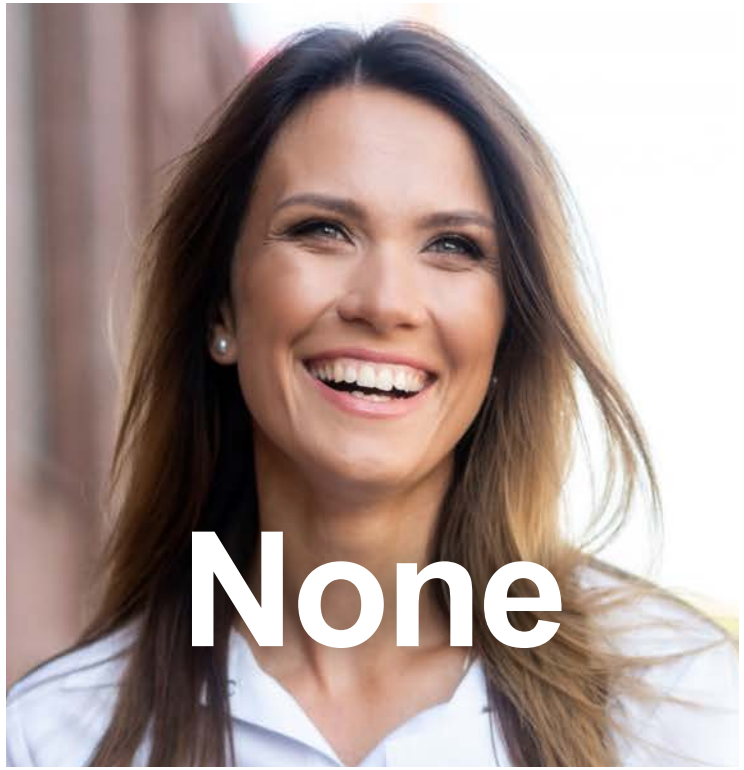
Effective and Safer than NSAIDs:
Zero reported GI Bleeds in 43 million doses

Side effects profiles.

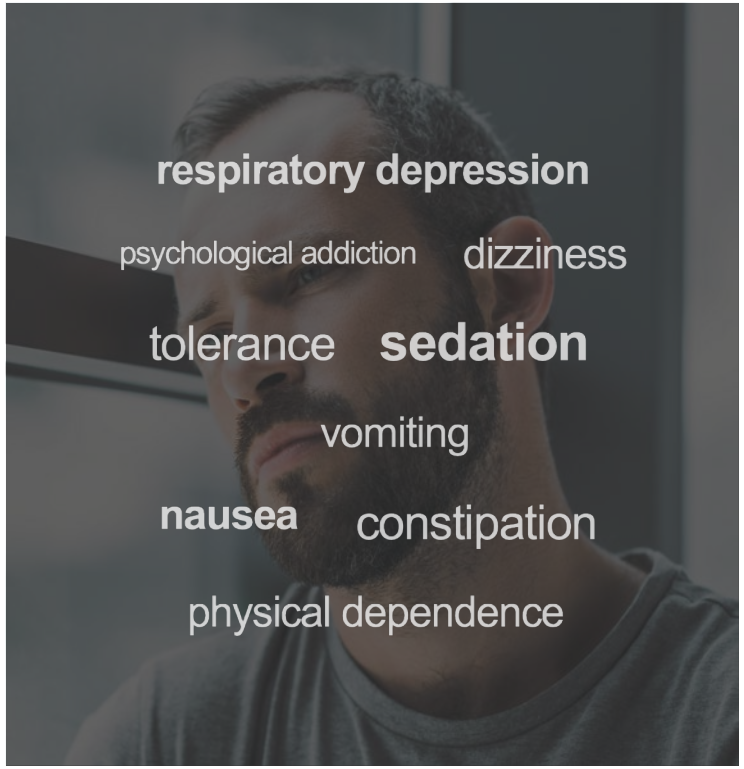
NSAID Side Effects



Theramine® Side Effects



Opioid Side Effects



“ Non-steroidal anti-inflammatory drugs are the leading cause of drug induced morbidity and mortality in the United States... based on this analysis,

Theramine® should be preferred in all cases instead of NSAIDs. ”

Theramine (A Medical Food) Versus Non-Steroidal Anti Inflammatory Agents in Elderly Patients: A Pharmacoeconomic Analysis.” David S. Silver, M.D.; Elizabeth H. Charuvastra, RN; Lawrence May, M.D.; Stephanie L. Pavlik, CRA; William E. Shell, M.D. Journal of Pharmacy Research (Volume 5, Issue 5); Published online: May 2012

Defining a new space in healthcare:

Nutritional Medicine.

Working with the body to address nutritional needs of conditions with safe and effective solutions for patients and providers.

Used alongside or in place of medications

Physician's Therapeutics brings safe & effective Nutritional Medicine solutions to patients.

- Proven Safe, effective and clinically-validated
- Published US clinical trials
- Patented
- Over 30 million doses safely used
- Messenger Amino Acid (mAA) Technology
- Used by physicians, pharmacists, patients (Previously Rx only)
- US and International distribution

Evidence based, patented, published US clinical trials to show safety and efficacy.

Example: Theramine leads to better pain management outcomes compared to NSAIDs in clinical studies.

Physician Therapeutics®

A Revolutionary New Approach to Chronic Pain

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