An Integrative Approach to Pain

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Helpful Health Resources

Medicine Lodge Ranch

Dr. Low Dog has created a new online classroom called Medicine Lodge Ranch to expand the reach of her natural medicine school located at her ranch in the heart of New Mexico’s Santa Fe National Forest.

Through our online courses, digital educational tools, and hands-on intensive classes at our ranch, you will have access to the resources to make yourself & your family both healthier and more whole. Learn more.

Conference Handouts:

- Star of the South – handouts: Integrative Approaches to Pain, Nutrition for the Dental Team
- The Rendezvous Conference – handouts: Nutrition and Dietary Supplements, Women’s Health
- Announcing 50% off – Herbal Medicine Making Course!
The Epidemic of Pain

- **>100 million Americans**, more than heart disease, cancer, diabetes combined.
- 25.3 million adults suffer from daily chronic pain
- 23.4 million report severe pain.
- Incidence of chronic low back pain, arthritic pain, and neck pain, and arthritic pain as high as 29%, 28%, and 15.7%, respectively, in adults.


Central Sensitization

- **Heightened sensitivity** to pain and sensation of touch (also to other senses like light or sound).
- Nervous system in **persistent state of heightened reactivity** - simple touch registered as painful.
- Increases feelings of **anxiety**, emotional distress, malaise, and poor concentration.
Opiates

• Opioid industry more than $13 billion-a-year. Americans comprise ~4% of the world’s population, we use > 30% of all opioids. US accounts for ~100% of hydrocodone (e.g., Vicodin), 81% for oxycodone (e.g., Percocet).

• 91 Americans die/day from opioid overdose; 50% prescription opiates.

• Clinicians ill-prepared to deal with complex problems associated with chronic pain: creates easy atmosphere for prescribing pain meds.

• Pharmaceutical companies pumped millions of dollars into telling physicians and public that medications were safe and effective for chronic pain.


The Down Side to Long-Term Use

• Opioids effective short-term pain relief but risks often outweigh benefits for many people living with chronic pain.

• For chronic non-cancer pain: adverse events with opioids 78% with medium and long term use (average 6-16 weeks) compared to placebo.

• Tolerance (need more medication for same pain relief), increased sensitivity to pain, physical dependence, lower sex drive, confusion, constipation, dry mouth, nausea and vomiting, and an increased risk of new onset depression after 3 months of use.

Ibuprofen and Naproxen

- Prospective Randomized Evaluation of Celecoxib Integrated Safety vs Ibuprofen or Naproxen (PRECISION) trial and patient data of ~ 500,000 patients: “evidence would support avoidance of NSAID use, if possible, in patients with, or at high risk for, cardiovascular disease.

- If used, shortest-duration and lowest effective dose should be chosen, given evidence that risk is both duration- and dose-dependent.”

- Study found ibuprofen associated with significant increase in systolic blood pressure and higher incidence of newly diagnosed hypertension.


Ibuprofen and Heart Disease

- FDA warning about NSAID use in patients with cardiovascular disease released in 2005 and strengthened in July 2015, yet survey data shows that those with CVD are more than twice as likely to use NSAIDs than those without CVD.

Aspirin and GI Bleeding

- Systematic review: low dose aspirin associated with double the risk for upper GI bleeding and 80% increased risk for lower GI bleed.
- With increased risk from low-dose aspirin (81-85 mg per day), deeply concerning about long-term use of high dose aspirin (2-3 g/d) for pain.
- PPI can protect against bleed but comes with own risks.

Acetaminophen (Paracetamol)

- Superior safety to ibuprofen, naproxen, and aspirin; commonly recommended as a first line therapy for pain.
- Maximum “safe” dose is 4000 mg/d but found in more than 600 OTC and prescription medications (e.g., Vicodin), dose can add up without realizing it.
Adverse Effects

- 2017: acetaminophen responsible for nearly half of acute liver failure cases in US - leading cause for liver transplantation.
- Study 64,839 men and women (ages 50-76 years) followed up to 8 years found almost two-fold increased risk of blood cancers associated with high use of acetaminophen (≥ 4 days/week for ≥ 4 years).


CDC report using data from the National Violent Death Reporting System, the percentage of people who died by suicide and had evidence of chronic pain increased from 7.4% in 2003 to 10.2% in 2014.
The Need for Alternatives

• Keen interest by researchers, clinicians and the public for additional/other options for managing chronic pain.

• **Chronic pain is the leading indication for use of complementary and integrative medicine with 33% of adults and 12% of children in the US using it for this purpose.**

• Although advances have been made in treatments for chronic pain, it remains inadequately controlled for many people.

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IOM Report

• **A cultural transformation is necessary to better prevent, assess, treat, and understand pain of all types.**

• Healthcare providers should increasingly aim at tailoring pain care to each person’s experience and self-management of pain should be promoted

A Broader Approach

- Treatments that address mind-body (e.g., meditation, yoga, tai-chi), nutrition (e.g., anti-inflammatory), manual medicine (e.g., massage, chiropractic), pain modulation (e.g., acupuncture, massage, botanicals, nutraceuticals), sleep and mood (e.g., cognitive behavioral therapy, guided imagery, botanicals, nutraceuticals).
Think More Broadly

- An integrated approach will move beyond the pain and explore…..
  - Sleep and Rest
  - Energy/Fatigue
  - Work/Career
  - Diet and Food
  - Relationships
  - Mind-Body
  - Meaning and Purpose

The Role of Diet in Pain

- **Review 172 studies**: daily consumption **low glycemic load** diet with minimum of 5 servings of fruits and vegetables; weekly 4 portions legumes/fish, no more than one portion of red meat and only occasional sweets optimal for reducing pro-inflammatory states associated with chronic pain.

Omega 3 Fatty Acids from Plants and Animals

- Dark green vegetables, walnuts, freshly ground flax seeds and other plant foods.

- Cold water fish, fish oil, fresh seaweed, clean animal foods like free range chicken, eggs, and grass fed beef.

Omega 3 Fatty Acids

- Preclinical findings suggest dietary omega-3/omega-6 ratio may have significance for inflammatory pain.
- Systematic review/meta-analysis suggests omega-3 fatty acid supplementation moderately improves chronic pain.
- Increasing omega-3 intake reduced patient-reported joint pain and morning stiffness in patients with rheumatoid arthritis or joint pain secondary to inflammatory bowel disease.

Omega 3 Index

• **Omega-3 Index** indicates % of EPA+DHA in red blood cell fatty acids.
• **What about chronic pain patients?** Should we assess omega 3 fatty acid level to optimize their “anti-inflammatory” activity?
• FDA has set 3 grams of omega 3 per day as safe level.


Magnesium

• Magnesium produces an **anti-nociceptive effect on animal models of neuropathic and inflammatory pain**.
• Analgesic in **acute** (postoperative pain) and **chronic** (neuropathic) pain.
• **Antagonist of N-methyl-D-aspartate (NMDA) receptor** ion channel, which plays key role in central sensitization. **Magnesium creates a blockade of the NMDA receptor in the spinal cord**.
• **Oral doses 300-600 mg** (do not supplement in patients with renal failure)

Musculoskeletal Pain

- **Leading cause** of long-term pain and disability around the globe.
- **Aging, obesity and lack of regular physical activity** are major risk factors for arthritis and back pain.
- In US, 52 million American adults have arthritis and by **2040, that number will reach 78.4 million, or roughly 26% of all adults.**


Body Weight

- For every **12 pounds of weight gain**, there is a **36% increased risk for developing OA.**
- Lumbar spine and knee two primary sites for pain in obese individuals. Reduction of body fat lowers mechanical and inflammatory stressors that contribute to OA.
- **Weight loss strongly associated with a reduction in pain.**
Topical Analgesia

- Menthol long history as **topical analgesic**. TRPM8 channels are “menthol receptors”
- Clinical studies report topical **menthol as safe and effective in treating variety of painful conditions**: musculoskeletal pain, sports injuries, neuropathic pain and migraine.


Essential Oil Ointments

- Vicks contains **eucalyptus, cedar wood, camphor, and menthol**, widely used for common cold and headache.
- Tiger-Balm contains **peppermint, eucalyptus, clove and cinnamon oils, menthol and camphor**, used for common cold, headache, rheumatic and muscular pains.
Topical NSAIDs

- **Cochrane review 39 studies** (10,631 patients) found that **gel preparations of diclofenac and ketoprofen** provide good pain relief over carrier alone for **patients with osteoarthritis**.
- Oral administration not superior to topical.


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Anti-Inflammatory Herbs

- There are many, but some to consider include:
  - Salix containing plants, like willow (*Salix spp*).
  - Turmeric (*Curcuma longa* and other species).
  - Ginger (*Zingiber officinale*).
  - Boswellia (*Boswellia serrata*).
  - Cannabis (*Cannabis sativa*).
  - Devil’s Claw (*Harpagophytum procumbens*).
  - Licorice (*Glycyrrhiza glabra, G. uralensis*).
Willow Bark (*Salix* spp)

- Willow bark supplements deliver up to 240 mg of salicin, can be metabolized to **113 mg salicylic acid**. Used for pain.
- Low-dose aspirin (62 mg of salicylic acid) must include guidelines on use in pregnant women/children; info on blood coagulation.
- **USP panel recommended same labeling for dietary supplements.**


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Turmeric (*Curcuma longa*)

- Family: Zingiberaceae (ginger family)
- Part Used: Rhizome
- Perennial plant grown in tropical areas, mostly in India. Used in meat, fish and vegetable curries.
- Long history of medicinal use ~4,000 years.
- Curcuminoid pigments highly active; **curcumin** main curcuminoid.
- Highly researched: more than 35,000 entries in the National Library of Medicine.

Turmeric for Arthritis

- Significant anti-inflammatory activity
- Tuft’s systematic review: curcumin significantly more effective than placebo and equivalent to NSAIDs for pain relief and functional improvement.
- Results suggest curcumin and boswellia formulations could be valuable addition to OA treatment regimens by relieving symptoms while reducing safety risks.


Turmeric + Boswellia (Boswellia serrata)

- 12 week RDPCT: 201 people with osteoarthritis (40-70 years).
- 350 mg curcumin + 150 mg boswellic acid taken three times daily led to statistically significant effect on physical performance tests and WOMAC joint pain index compared to placebo.
- Well tolerated, no significant adverse events.

Turmeric for Depression?

- Mini meta-analysis of 6 studies found curcumin **reduced depression symptoms**, particularly in middle-aged patients when given at higher doses for longer periods of time.
- Authors concluded, “**there is supporting evidence that curcumin administration reduces depressive symptoms in patients with major depression.**”
- Is it due to systemic reduction in inflammation?
- Is this modulated through the gut?


Absorption and Safety Issues

- Turmeric/curcumin not well absorbed into bloodstream from GI tract.
- Best taken turmeric/curcumin 2 times per day
- Preparations bound to phosphatidycholine (Meriva) or piperine (2-5 mg per 500 mg curcumin) superior absorption.
- Dose **1000-1500 mg/d standardized extract (95% curcumin)** used in most of the trials.
Ginger
*(Zingiber officinale)*

- **Clinical studies:** ginger powder 500-2000 mg/d first 3-4 days of menses decreases menstrual pain. **Meta-analyses:** overall decrease 2.3-2.6 points on 10 point pain scale.
- **Ginger extracts 200-250 mg QID** for 3 days at the beginning of menses or until pain relief: reduces symptoms similar to ibuprofen or mefenamic acid.
- **Ginger 250 mg at onset of migraine** is as effective as 50 mg sumatriptan for reducing headache severity within two hours of treatment (menstrual migraine?)


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Peppermint Leaf Essential Oil IBS

- **Meta-analysis RCTs:** soluble fiber, antispasmodic drugs, peppermint oil, and gut-brain neuromodulators for IBS.
- **Peppermint oil ranked first for efficacy when global symptoms were used as the outcome measure,** and tricyclic antidepressants were ranked first for efficacy when abdominal pain was used as the outcome measure.
- **Dose 0.2 ml taken 2-3 times daily.**

Cannabis sativa

- One of oldest cultivated crops.
- Hemp and marijuana same plant with very different chemical profiles.
- Marijuana widely used as analgesic in 19th century. Listed in USP.
- AMA opposed the Marijuana Tax Act in 1937.
- 1970 Controlled Substance Act listed Cannabis as Schedule 1 drug but many states have legalized for medicine and/or recreation.

Cannabis and THC

- One Cannabis species with subspecies (e.g., C. indica)
- More than 540 compounds identified, 104 are cannabinoids.
- Major psychotropic component is Δ9-tetrahydrocannabinol (THC).
- When 26,145 samples of marijuana were analyzed covering the span of 1995-2014, testing showed average of 4% THC in 1995, which rose to approximately 12% in 2014. Far more euphoric and potent.

Cannabis and Pain

- Systematic review and meta-analysis of cannabinoids: 28 RCTs (2454 patients) with chronic pain found that, compared with placebo, cannabinoids associated with greater reduction in pain.
- Cannabis containing THC greater analgesia.
- Dosing remains confusing: most studies using CBD used 300 mg per day, far greater than what is commonly used.


Cannabis (Marijuana)

- THC approved for chemotherapy-related nausea and vomiting (1986), anorexia in patients with AIDS (1992)
- Analgesia best supported use; some data for sleep, mood, and anxiety.
- Benefit for peripheral neuropathy (pain reduction, better sleep, improved function) even in patients with symptoms refractory to standard therapies.

Cannabidiol (CBD)

- Cannabidiol (CBD) found in marijuana and hemp.
- Does not produce euphoric effects but has antipsychotic, anxiolytic, anti-seizure, analgesic, anti-inflammatory effects.
- Epidiolex FDA approved for seizures refractive to treatment
- Research shows modest analgesic effects.

Back Pain

Lower back pain highly disruptive, second leading cause of disability.

Pain can be severe, making walking, standing and traveling long distances difficult, even though physical activity is effective for improving and preventing back pain.

Frequently associated with anxiety, depression and irritability.

2nd major cause of short-term workplace absences; estimated 149 million days of work/year lost due to low back pain.

American College of Physicians provides treatment guidance based on efficacy, comparative effectiveness, and safety of noninvasive pharmacologic and nonpharmacologic treatments for low back pain in primary care:

- acute (<4 weeks)
- subacute (4 to 12 weeks)
- chronic (>12 weeks)

Recommendations on following slides.


Most patients with acute or subacute low back pain improve over time regardless of treatment, clinicians and patients should select non-pharmacologic treatment with superficial heat, massage, acupuncture, or spinal manipulation.

If pharmacologic treatment is desired, clinicians and patients should select NSAID or skeletal muscle relaxants

(Grade: strong recommendation)
Spinal Manipulation for *Acute* Back Pain

- 15 RCTS found *spinal manipulation* resulted in an improvement in pain of about 10 points on a 100-point scale.
- 12 RCTS found *spinal manipulation* resulted in improvements in function.


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*Chronic Low Back Pain Guidance*

- Initially non-pharmacologic treatment
  - *exercise, rehab, acupuncture, mindfulness-based stress reduction, tai chi, yoga, progressive relaxation, electromyography biofeedback, cognitive behavioral therapy, or spinal manipulation*
  
  (Grade: strong recommendation)
Headaches

- Migraines/headaches ~ 13% of US population.
- Highest in women 18-44 yrs; 3-month prevalence of migraine or severe headache is roughly 26%.
- Head pain third leading cause for ER visits.
- 70% say headaches caused problems in relationships, 59% have missed family and social events and 51% report that migraines cut their work and school productivity in half.


Acupuncture for Migraine

- Cochrane review 22 trials (n=4985): evidence suggests adding acupuncture to symptomatic treatment reduces frequency of headaches. Trials also suggest that acupuncture may be at least similarly effective as treatment with prophylactic drugs.
- “Acupuncture can be considered a treatment option for patients willing to undergo this treatment.”

Magnesium for Migraines

• Studies show migraineurs have low brain Mg during migraine attacks and may have systemic Mg deficiency.

• Canadian Headache Society: strong recommendation for prophylaxis with 600 mg magnesium citrate.

• Diarrhea most common side effect (mag glycinate and citrate less GI complaints than oxide). Caution in those with poor renal function.


Coenzyme Q10 for Migraines

• CHS guidelines gave a strong recommendation for prophylaxis of migraine: 300 mg/d.

• The AAN/AHS gave a Level C recommendation, stating it is possibly effective and may be considered for migraine prevention.

• 200-300 mg per day

Riboflavin for Migraines

• CHS guidelines gave strong recommendation for benefit, and minimal side effects.
• AAN/AHS give riboflavin Level B recommendation, probably effective and should be considered for migraine prevention. 200 mg BID
• Deficiency: increases light sensitivity


Ginger (*Zingiber officinale* )

• Study 60 adults at ER for treatment of migraine randomized to 400 mg ginger extract (5% gingerol) or placebo + 100 mg IV ketoprofen
• Patients filled out headache diary before, 0.5h, 1h, 1.5h, and 2h after medication. Severity, functional status, migraine symptoms recorded.
• Ginger group showed significantly better clinical response after 1 h \( (p = 0.04) \), 1.5 h \( (p = 0.01) \) and 2 h \( (p = 0.04) \); pain reduction and improved functional status reported at all time points.

Peppermint: Headache

- Topical treatment with peppermint essential oil shown significantly more effective than placebo in controlled studies.
- Efficacy comparable to aspirin or acetaminophen. Peppermint oil in ethanol licensed for treatment of tension-type headache in adults and children above 6 years in Germany.

Temporomandibular Disorder

- Term used to group conditions in the masticatory muscles and the temporomandibular joint (TMJ), impaired movement capacity of the mandible, and TMJ symptoms such as clicking, grating and locking of the jaw.
- Most common cause of chronic orofacial pain.
**TMD: Significant Cause of Pain**

- **5-12%** of population. **Second** most common musculoskeletal condition (after chronic low back pain) resulting in pain and disability.
- **Arthralgia, local myalgia, myofascial pain, myofascial pain with referral, degenerative joint disease, subluxation, and headache.**


**TMP Pain Screening Tool**

- Responses from screener can be used as **part of the process for a pain-related TMD diagnosis.**
- **Sensitivity 99.1%** for both short (3 questions) and long questionnaire (6 questions): specificity was 95-98%.
- **Radiographic imaging confirms TMD diagnosis.**
- Patients are **interested in treatment.**

Care Option

- Ice or heat applications
- Soft foods when pain acute
- Self-care exercises
- Physical therapy
- Splint
- Anti-inflammatory diet
- Topical analgesics (e.g., capsaicin)
- Acupuncture

Splint Versus Self Exercise

- 52 people anterior disc displacement without reduction randomly assigned to splint or a joint mobilization self-exercise treatment group.
  - Warm-up, small mouth-opening and closing movements several times. Then mandibular downward pressure: 3 cycles of 30 seconds each 4 times per day.
  - Participants in splint group wore a maxillary stabilization appliance while sleeping at night. Splint adjusted to ensure occlusal contact of all mandibular teeth in centric relation and mandibular canine guidance in eccentric movement.

- All outcome variables significantly improved after 8 weeks of treatment in both groups (mouth opening range, maximum daily pain intensity, limitation of daily functions). Mouth opening range increased more in the exercise group than in the splint group.

Botox

- UCSF and VA Study: 71 patients with TMD with or without bruxism and refractory to conventional treatment (e.g. oral appliances, physiotherapy, etc.) received injections into temporalis and masseter muscles.
- 77% reported beneficial effects. Subjects with a concomitant bruxism diagnosis reported significant improvement over subjects without bruxism (87% vs. 67%).
- Note: injection in lateral pterygoid also beneficial, but difficult.

Acupuncture and Dry Needling

- Small studies show dry needling or acupuncture of the lateral pterygoid and posterior, periarticular connective tissue, masseter and temporalis muscles improves pain and disability in patients with TMD.


Mood, Sleep and Pain

- Study 273,952 individuals/47 countries found depression significantly associated with severe pain (odds ratio 3.93).
- High prevalence of concomitant pain and sleep disturbance.
- Short sleep duration increases risk for developing chronic pain.
- Study healthy young women found after just two nights of fragmented sleep: increased pain sensitivity in both superficial and deep tissues.

The Basics

1. Set a sleep schedule and stick to it.
2. Make your bedroom dark, quiet and cool.
3. Turn off electronics and or use blue light blocking technologies.
4. Watch the caffeine. Discontinue by noon if trouble sleeping.
5. Power naps: can be good if 20-30 minutes in duration
7. Don’t go to bed hungry.
8. Find ways to deal with “worries” ……
9. Get sleep evaluation if sleep disruption and/or daytime fatigue continues
10. Controlled-release melatonin recommended as first-line agents in older adults. (2 mg sustained release for 4-6 weeks and re-evaluate).

Cognitive Behavioral Therapy

• Recommended first-line therapy for insomnia. Digital CBT can be effective for improving sleep, as well as mental health and well-being.
• CBT-I typically consists of:
  • Psychoeducation about sleep and insomnia
  • Stimulus control
  • Sleep restriction
  • Sleep hygiene
  • Relaxation training
  • Cognitive therapy
• Sleepio, CBT-I Coach (free)

Melatonin

- Melatonin maintains sleep-wake cycle, acts as an antioxidant, **anti-inflammatory**, **pain reliever**, and **mood regulator**, making it ideal for many with chronic pain.
- Systematic review **19 studies**: significantly **decreases pain intensity**, regardless of the type of pain.
- Plays important role in GI physiology: regulation of gastrointestinal motility, local anti-inflammatory reaction and moderation of visceral sensation. Studies show it can **improve symptoms and quality of life in people living with IBS**.


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Melatonin Sleep and Safety

- Meta-analysis: **12 randomized, placebo-controlled trials** found convincing evidence melatonin reduces time it takes to fall asleep in **primary insomnia** (p = 0.002) and **delayed sleep phase syndrome** (when it takes 2 or more hours to fall asleep past conventional bedtime) (p < 0.0001).
- Studies **failed to show any serious adverse effects**, even at extreme doses (100 mg) in adults. Doesn’t suppress endogenous production of melatonin and no rebound insomnia when discontinued.
- **Dose generally 2-3 mg 2 hours before bed.**

California Poppy

(Emescholzia californica)

- Official state flower California. Native Americans used as food and medicine for millennia.
- Aerial plant used to relieve tooth pain, headache, and promote sleep.
- Basic science shows it acts on GABA-A receptors in the brain, similar to a benzodiazepine, but without habit-forming tendency of the drug. Has anxiolytic, analgesic, sedative activity.


- European Union monograph recognizes traditional use for relief of mild symptoms of mental stress and to aid sleep.
- Research indicates that a “standardized extract of California poppy can be used in the management of chronic pain and as a hypnotic-mild-sedative for the management of pain-related insomnia.”
- Dose: 300-600 mg 1-2 times per day.
Mindfulness Meditation

• Mindfulness meditation excellent as it can decrease pain intensity and stress levels.
• Long-time meditators have greater activation of areas responsible for sustaining attention, processing empathy, integrating emotion and cognition.
• Review of 47 trials found meditation improves:
  • Anxiety
  • Depression
  • Pain


Meditation Resources

• Calm – great app for guided meditation, bedtime stories, breathing exercises (free to $60 annual subscription)
• Insight Timer - ~4,000 guided meditations >1,000 teachers (self-compassion, nature, stress, podcasts). Music tracks (free to $5/mo)
• Headspace – meditation, videos, meditations music (free basic course, $12.99 mo, $95/year)
• 10% Happier – performance enhancement. Busy people, stressed lives. (Free one week intro, then $100 per year).
• Buddhify - for the more advanced meditator. Can sort by location, activity and/or emotion. (small monthly fee, premium is $30/yr).
Meaning and Purpose

• What truly gives a person a sense of meaning and purpose in life?
• How can someone discover her life purpose to focus on the essence of who she is? Her be-ing.
• How can one live from a “deep place” despite his or her pain?
• So important to explore..... it is often the key to less suffering.....

Viannna Low Dog, M.D.

Listen.
Are you breathing just a little and calling it a life?
~ Mary Oliver