



Compounded Solutions for Pain Management

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Compound Options

- Topical Pain Creams
- Ketamine
- Low Dose Naltrexone (LDN)

Disclaimer: FDA does not review compounded preparations for safety and efficacy, thus none of these discussed are "FDA approved"

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Bottom Line with Pain Creams

- The peripheral localized topical application of drugs can potentially
 - ✓ Optimize drug concentrations at the site of origin of pain
 - ✓ Lead to lower systemic levels, fewer systemic adverse effects and fewer drug interactions
 - ✓ No need to titrate doses into a therapeutic level compared with systemic administration

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What's the Source of Pain?

Inflammatory issue?
• Arthritis, tendinitis, plantar fasciitis, sprains, strains, muscular/skeletal issues

Neuropathic issue?
• CRPS or RSD, post herpetic, diabetic, traumatic injuries

Combination of both?

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Making the Choice




- Can be used acutely, chronically, and post-surgically
- Can be used in combination with other oral analgesics, due to minimal system absorption
 - NSAIDS
 - Opioids
 - Tri-cyclics (TCA's)
 - Muscle relaxers

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Inflammation

- Topical NSAIDS
 - Ketoprofen(10-20%)
 - Ibuprofen(10-20%)
 - Piroxicam (2-5%)
 - Diclofenac (1-10%)
- Formula example with many successful stories
 - Ketoprofen 10%, Ibuprofen 10%, Cyclobenzaprine 2%, Piroxicam 2%, Lidocaine 5% (KICK 2)

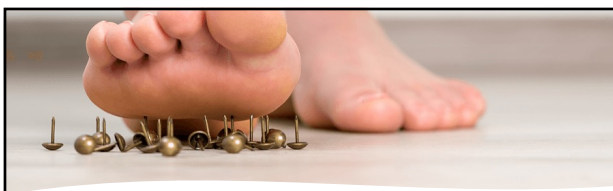


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Topical NSAIDs

- FDA approved examples
 - Voltaren, Pennsaid (DMSO), Flector Patch
 - Widely used and very effective topically
- MOA
 - Lower prostaglandins in periphery due to lowering COX enzymes
 - Able to treat PAIN and INFLAMMATION
 - Cause no issue with GI distress in patients that cannot tolerate oral NSAIDs
- Topical NSAIDs are thought to afford efficacy that is comparable to oral formulations while reducing widespread systemic drug exposure, which may provide a benefit in terms of safety and tolerability.

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Neuropathic Pain

- Treat with multiple API's to hit multiple receptor types
 - NMDA, GABA, AMPA, Alpha-2
- Will typically include a combination of:
 - Ketamine, Gabapentin, TCA's, Clonidine, Muscle relaxers, +/- a "caine"

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Neuropathic (APIs)

- Ketamine, Amantadine
- Gabapentin, Pregabalin
- Clonidine
- TCA's – Amitriptyline, Imipramine, Doxepin
- Muscle Relaxers – Cyclobenzaprine, baclofen, guaifenesin, Magnesium
- "Caine's" – Lidocaine, Tetracaine, Bupivacaine, Prilocaine

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Combination Formulas

- Customize to the patient's pain type
- Very effective and many variations
- If one formula does not work great, tweak it and try another variation
 - Every patient is unique, customization is key
 - What works for one patient, may not necessarily for another



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Patient Instructions & Counseling Tips

- Have patients apply TID-QID
- Very important to rub in thoroughly, and apply it wherever it hurts
- Many patients will see relief after just one application
- When patients do not see immediate relief it's important to instruct them to continue to apply the medication due to the building up effect in tissue

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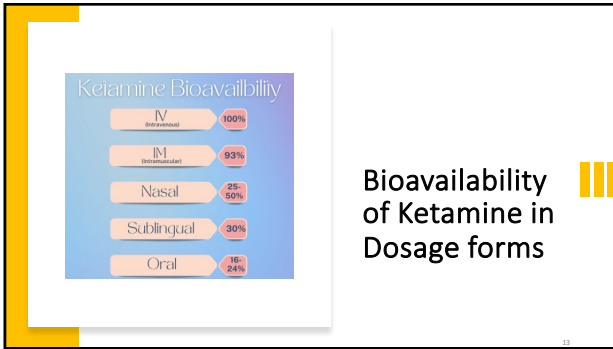
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Ketamine

- A lot of recent literature showing benefits for a variety of conditions.
 - Many studies looking at its use in depression and other psychiatric related issues and chronic pain.
- Can be compounded in a variety of dosage forms.
 - IV, IM injections, nasal spray, troches/lozenges (SL), oral capsules and topical pain creams
 - Bioavailability issues with some dosage forms

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Bioavailability of Ketamine in Dosage forms

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Clinical Examples with Ketamine

- We currently compound Ketamine oral capsules, Nasal spray and lozenges/troches as well as the injectable due to being on FDA shortage.
 - We've had success with a chronic pain patient using low dose Ketamine 5-25mg dosed daily QPM or in BID doses.
 - We've been able to get a handful of patients off opioids.



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Low Dose Naltrexone - LDN

- Not currently FDA approved for treating chronic pain, although many clinical trials ongoing
 - The use of low-dose naltrexone (LDN) as a novel anti-inflammatory treatment for chronic pain. PMID: 24526250 Clin Rheumatology <https://doi.org/10.1007/s10067-014-2517-2>
 - LDN reduced symptom severity in such conditions as fibromyalgia, Crohn's, MS, and CRPS
- LDN also being used for various autoimmune diseases and cancers

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Mechanisms of Action for LDN

- Opioid blocker/Mu receptor - reversible antagonist which results in an increased production endogenous opioids (endorphins & enkephalins) which lowers pain and inflammation.
- Upregulates Opioid Growth Factor (OGF) axis.
- Glial cell modulator – blocks TLR4 signaling which blocks glial cell activation of proinflammatory cytokines and other inflammatory substances like IL6, IL12, TNF
- Modulates T and B lymphocyte production

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Dosing LDN

- Low Dose is considered 4.5mg and lower. Many will start at 1.5mg and titrate up over 30-60 days to max dose of 4.5mg
- Very well tolerated, only noted side effect is “vivid dreams” which is typically dose dependent and seen as dose increases
- Compounded medication that runs about \$50/month

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Questions?

Thank You!



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