

The Mortar & Pestle:

MD Custom Rx's monthly e-newsletter

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Greetings!

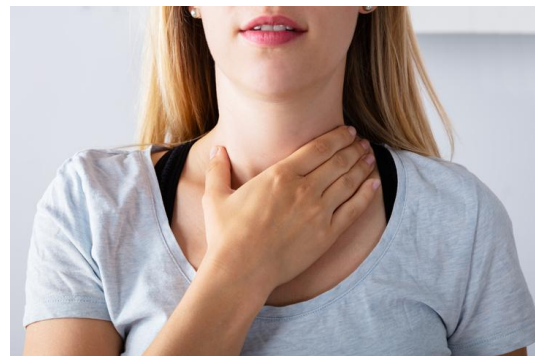
Thank you for entrusting in the compounding services at MD Custom Rx to help meet the unique medication needs of your patients. We are excited to share our monthly newsletter with you and look forward to continuing to be your medication problem solvers. Please don't ever hesitate to let us know how we can be of further assistance to you and your practice.



Sincerely,
Dan, Monica and John

Need Thyroid?

Thyroid hormone preparations have been backordered or recalled many times since 2017. In September 2020, RLC Labs, Inc., voluntarily recalled Nature-Throid® and WP Thyroid® because FDA testing of samples from six lots found the samples to be sub potent. Although not an exact replacement, these medications have often been substituted for Armour Thyroid®. All of these preparations contain Desiccated Thyroid Extracts (DTE).



Other types of thyroid hormone replacement include levothyroxine (T4) and liothyronine (T3). Levothyroxine is one of the most widely used drugs worldwide: its use has increased over the past 15 years and is projected to increase further over the next decade. Liothyronine is short acting and rarely used because it often produces intolerable side effects.

The human thyroid gland naturally makes the active form of thyroid hormone (T4) which is converted to another form of thyroid hormone (T3) elsewhere in the body. However, in some people who take synthetic levothyroxine, such as those who have Hashimoto's thyroiditis, the conversion to T3 may be inadequate and therefore they don't have the full range of thyroid hormones that are needed for the body to function optimally. Many

patients have found that Desiccated Thyroid Extracts work best for them, reporting that they simply do not feel as well when they take levothyroxine alone or with liothyronine.

[Drugs Context. 2019; 8: 212597.](#)

Thyroid hormones, unlike other drugs, often do not work best on a fixed-dose regimen, but rather may require dosing adjusted to the specific needs of each patient. Ask our pharmacist for more information about customized thyroid preparations and how we can help if medications are backordered or recalled.

Low Dose Naltrexone (LDN): A Potential Therapeutic Candidate for COVID-19

Like other coronaviruses, SARS-CoV-2 relies on the surface spike glycoprotein to access the host cells, mainly through the interaction of its Receptor Binding Domain (RBD) with the host receptor Angiotensin-Converting Enzyme 2 (ACE2). SARS-CoV-2 infection can induce a profound downstream pro-inflammatory cytokine storm. This release of the pro-inflammatory cytokines is underpinning lung tissue damage, respiratory failure, and eventually multiple organ failure in COVID-19 patients. The phosphorylation status of ERK1/2 (extracellular signal regulated protein kinase) is positively correlated with viral load and ERK1/2 inhibition suppressed viral replication and viral infectivity. Therefore, molecular entities able to interfere with binding of the SARS-CoV-2 spike protein to ACE2, dampening a hyperinflammatory cytokine storm, or blocking ERK1/2 phosphorylation have a great potential to inhibit viral entry along with viral infectivity. The non-peptide opioid antagonist drug naltrexone suppresses high fat/LPS induced pro-inflammatory cytokine release both from macrophage cells and Adipose Tissue Macrophage. Moreover, Low Dose Naltrexone (LDN) also showed its activity as an ERK1/2 inhibitor. Notably, virtual docking and simulation data also suggest LDN may disrupt the interaction of ACE2 with RBD. Therefore, LDN may be considered as a treatment and/or adjuvant therapy for coronavirus infection. Clinical toxicity measurements may not be required for LDN since naltrexone was previously tested and is an FDA-approved medication.

[J Biomol Struct Dyn. 2020 Sep 15;1-8.](#)

Low Dose Naltrexone (LDN): Non-opioid Treatment for Chronic Pain Syndromes

Patients with cardiac failure, chronic lung disease, diabetes, and other terminal illnesses account for two-thirds of patients in need of palliative care, and they can experience comparable pain to that of patients with cancer. Management is crucial because pain can have a devastating impact on the quality of life. Opioid-based medications can cause gastrointestinal (GI) side effects such as nausea and constipation, mental status changes, hemodynamic disturbance, and respiratory depression. There is also concern about the long-term use of opioids, given the potential for addiction and abuse, as well as the possibility of opioid-induced hyperalgesia.

Non-opioid analgesics have limitations due to GI, cardiovascular, and renal adverse effects; therefore, an alternative approach to pain management is needed that would adequately alleviate pain and enhance quality of life without significant risks. Low Dose Naltrexone (LDN) is increasingly used as an off-label treatment for several autoimmune diseases including multiple sclerosis and inflammatory bowel disease, as well as chronic pain disorders including fibromyalgia, complex regional pain syndrome (CRPS), and diabetic neuropathy. LDN also has the potential to improve mood disorders and enhance the quality of life.

Naltrexone used in doses of 1 to 5 mg (LDN) acts as a glial modulator with a neuroprotective effect. LDN binds to Toll-like receptor 4 (TLR4) and acts as an antagonist,

therefore inhibiting the downstream cellular signaling pathways that ultimately lead to pro-inflammatory cytokines, therefore reducing inflammatory response. Another mode of action of LDN involves transient opioid receptor blockade which upregulates opioid signaling and results in increased levels of endogenous opioid production, known as opioid rebound effect.

LDN may also be helpful in treating cancer-related pain and may improve quality of life in patients unable to tolerate chemotherapy due to LDN's immune-enhancing effects. Research indicates that LDN may promote resilience and emotional well-being, as well as improvement of psychiatric problems such as anxiety and depression. However, larger studies need to confirm these potential benefits.

LDN is inexpensive and has a low side effect profile, with some reported incidences of vivid dreams, nightmares, headaches, and anecdotal reports of anxiety and tachycardia. There has not been any observed toxicity or withdrawal symptoms with chronic use. Naltrexone is primarily renally excreted; however, dose adjustment is not needed with mild-renal impairment. Dose adjustments in moderate to severe renal impairment have not been studied. Naltrexone does not significantly affect liver function.

LDN is not commercially available but can be prescribed for preparation by our compounding pharmacy.

[Am J Hosp Palliat Care. 2019 Oct;36\(10\):907-912.](#)

MD Custom Rx Educational Events

We regularly offer educational events at the pharmacy. Be sure to share our events with your patients. [VISIT OUR WEBSITE](#) to see our schedule and to register. If you are interested in speaking on a topic, please contact the pharmacy.



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