PHYSICIANS PREFERENCE
Q2 2026 • VOL. 7, NO.2

ENHANCING COGNITIVE FUNCTION WITH LDN & METHYLENE BLUE

Brain fog, poor concentration, fatigue, low motivation and impaired memory retrieval have become increasingly common complaints among patients in recent years. While the causes are multifactorial, neuroinflammation and mitochondrial dysfunction are now recognized as major contributors to cognitive decline and impaired neurological performance.

Two compounds gaining significant clinical attention for supporting cognitive function are Low Dose Naltrexone (LDN) and methylene blue. While their mechanisms differ, both work upstream to improve cellular function, reduce inflammation and support neurological resilience.

Low Dose Naltrexone (LDN) and Neuroinflammation

At low doses, naltrexone behaves very differently than its traditional 50mg dosing used for opioid dependence. Typically dosed between 0.5–9mg daily, LDN exhibits immunomodulatory and anti-inflammatory effects throughout the body and central nervous system.

One of the primary mechanisms behind the cognitive benefits of LDN is its ability to modulate activated microglia within the brain. Chronic microglial activation contributes to inflammatory cytokine release, neurotoxicity and impaired neuronal signaling which may manifest clinically as:

- Brain fog
- Poor concentration
- Fatigue
- Mood instability
- Sleep disruption
- Memory impairment
- Chronic pain sensitization

By calming neuroinflammatory signaling, many patients report improvements in mental clarity, focus, motivation and cognitive stamina over time.

Clinically, LDN is commonly utilized in patients with:

- Long COVID and post-viral syndromes
- Lyme disease
- Chronic fatigue syndrome
- Fibromyalgia
- Autoimmune conditions
- Mast cell activation syndrome
- Depression associated with inflammation

Methylene Blue and Mitochondrial Optimization

While LDN primarily targets neuroinflammation, methylene blue works at the mitochondrial level to improve cellular respiration and ATP production.

Methylene blue acts upon cytochrome c oxidase within the electron transport chain, helping optimize oxygen utilization and mitochondrial efficiency. Because the brain has one of the highest metabolic demands in the body,

HOW TO ORDER

Call or fax your prescriptions:

Fax 281.828.9669

Tel 281.828.9088

NEED SUPPLIES?

For Rx sheets, product catalogs, and supportive materials, please call or email us:

281.828.9088

pharmacy@physicianspreferencerx.com

physicianspreferencerx.com

TAKE A VIRTUAL TOUR

Click here to view an inside look at our compounding labs.

PHARMACY COMPOUNDING ACCREDITATION BOARD
ACCREDITED

Physicians Preference Pharmacy is a Houston-based, PCAB-accredited compounding pharmacy serving physicians and patients since 2001. We are licensed to work with and ship to doctors and patients in 49 states (excludes AL). Our standards are more stringent than those of the United States Pharmacopeia (USP). Physicians Preference Pharmacy ranks first in Houston for the number of samples sent for potency testing and in the top 8% of pharmacies nationwide.

mitochondrial dysfunction can significantly impair cognition, energy production and neurological performance.

At low doses, methylene blue may support:
- Memory retrieval speed
- Focus and concentration
- Mental energy
- Cellular oxygen consumption
- ATP production
- Neuroprotection

Methylene blue readily crosses the blood-brain barrier, making it particularly useful for neurological applications. Clinically, patients often report improvements in attention, mental clarity and cognitive endurance, especially in individuals experiencing chronic inflammatory or post-viral states.

DOSING CONSIDERATIONS

LDN

Typical oral titration:
Week 1: 1.5mg PO daily
Week 2: 3mg PO daily
Weeks 3–4: 4.5mg PO daily

Many patients now require doses between 6–9mg daily for full efficacy, while highly sensitive patients may respond best to lower dosing strategies.

Methylene Blue

Most patients benefit from dosing between 10–60mg daily, generally within the range of 0.5–2mg/kg/day.

IMPORTANT! More is not always better. At low doses, methylene blue behaves as a mitochondrial enhancer and antioxidant, while excessively high doses may promote oxidative stress. Additionally, a G6PD lab test should be run for all patients prior to prescribing methylene blue, as a G6PD enzyme deficiency would exclude prescribing this for the patient.

WATCH AND LEARN MORE:

Cognitive Benefits of Low Dose Naltrexone
with Bryana Burken, PharmD, RPh

Methylene Blue FAQs
with Bryana Gregory, PharmD, RPh

FAST FACTS

LDN
- Modulates activated microglia
- Reduces neuroinflammation
- Supports immune balance
- Improves brain fog and cognitive clarity
- Commonly utilized in post-viral syndromes

Methylene Blue
- Enhances mitochondrial respiration
- Improves ATP production
- Supports oxygen utilization
- Crosses the blood-brain barrier
- May improve memory and focus

CLINICAL PEARLS

Patients struggling with persistent cognitive dysfunction frequently exhibit both neuroinflammation and mitochondrial impairment. In these patients, addressing both pathways simultaneously may provide significantly greater clinical improvement.

Many providers are utilizing LDN and methylene blue together as part of a broader cognitive support strategy for patients with Long COVID, chronic inflammatory conditions, neurological dysfunction and age-related cognitive decline.

As always, individualized dosing and gradual titration remain essential for optimal patient outcomes.

REFERENCES

Cognitive Benefits of Low Dose Naltrexone (LDN) with Bryana Burken, PharmD, RPh. Dr. Hotze's Wellness Revolution Podcast. 2026.
Methylene Blue FAQs with Bryana Gregory, PharmD, RPh. Dr. Hotze's Wellness Revolution Podcast. 2026.
Atamna H, et al. Methylene blue delays cellular senescence and enhances key mitochondrial biochemical pathways. *FASEB J.* 2008.
Younger J, et al. The use of low-dose naltrexone as a novel anti-inflammatory treatment for chronic pain. *Clinical Rheumatology.* 2014.