

EXPANDING THE CLINICAL UTILITY OF NITAZOXANIDE

A Broad-Spectrum Antimicrobial With Emerging Applications

Over the past two decades, nitazoxanide has quietly evolved from a niche antiparasitic therapy into a clinically valuable antimicrobial with broad antiviral, antibacterial, and protozoal activity. Originally developed in the 1970s as an anti-parasitic agent, its pharmacologic versatility has prompted increasing clinical interest in gastrointestinal infections, viral respiratory illnesses, and dysbiosis-driven conditions.

At Physicians Preference Pharmacy, we frequently work with prescribers seeking well-tolerated, broad-spectrum agents which may address complex infectious or dysbiotic presentations—particularly when conventional therapies fail or recurrence occurs. Nitazoxanide represents one such option with a unique mechanism that differentiates it from traditional antiparasitic, antiviral, and bacteria-fighting agents.

MECHANISM OF ACTION: TARGETING ANAEROBIC METABOLISM

Nitazoxanide belongs to the thiazolide antimicrobial class and functions as a prodrug. After oral administration, it is rapidly metabolized in the

liver to its active circulating metabolite tizoxanide. Its primary antimicrobial mechanism involves inhibition of the pyruvate-ferredoxin oxidoreductase enzyme:

Pyruvate-ferredoxin oxidoreductase (PFOR)

This enzyme is essential for anaerobic energy metabolism in many bacteria, protozoa, and parasites. By interrupting these electron transfer reactions, nitazoxanide effectively disrupts microbial energy production and survival.

Additional mechanistic characteristics include:

- Disruption of anaerobic metabolism in bacteria and parasites
- Interference with viral protein maturation
- Host-directed antiviral activity
- Modulation of inflammatory cytokines
- Low potential for microbial resistance due to host-targeted pathways

Unlike many antivirals that target the microorganism directly (ie: oseltamivir), nitazoxanide partly acts through host-mediated antiviral pathways, making resistance development less likely.

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@physicianspreferencex.com

 [physicianspreferencex.com](https://www.physicianspreferencex.com)

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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.

ANTIVIRAL APPLICATIONS:

Influenza

Nitazoxanide has demonstrated antiviral activity against influenza through a mechanism distinct from neuraminidase inhibitors. Rather than blocking viral release, thiazolides interfere with hemagglutinin maturation, preventing proper viral assembly. This results in the formation of non-infectious viral particles and reduces viral load when therapy is initiated early.

Additional antiviral effects include:

- Upregulation of Type I interferons
- Enhanced intracellular antiviral signaling
- Activity against oseltamivir-resistant strains (in vitro)
- Disruption of intracellular viral protein processing

This host-directed mechanism offers a potential advantage when viral mutations limit the efficacy of traditional antiviral therapies.

SARS-CoV-2

Nitazoxanide has also been investigated for its potential role in viral respiratory infections, including SARS-CoV-2.

Research suggests several mechanisms of interest:

- Interference with post-translational maturation of the viral spike protein
- Reduced viral ability to bind ACE2 receptors
- Upregulation of interferon-stimulated antiviral genes
- Inhibition of pro-inflammatory cytokines
- Possible bronchodilatory effects

These properties may support preservation of early

immune responses and reduction in viral replication.

GASTROINTESTINAL APPLICATIONS: SIBO & DYSBIOSIS

Small Intestinal Bacterial Overgrowth (SIBO) often involves **mixed microbial populations**, including gram-positive organisms, gram-negative organisms, anaerobes, and protozoa. Patients may present with bloating, abdominal distension, altered bowel patterns, and food intolerances driven largely by fermentation processes. Nitazoxanide offers several characteristics that make it clinically interesting in this setting.

Broad Microbial Coverage

When compared with rifaximin, **nitazoxanide demonstrates activity against:**

- Gram-positive bacteria
- Gram-negative bacteria
- Anaerobes
- Protozoa (*Giardia*, *Dientamoeba fragilis*, *Blastocystis hominis*)
- Biofilm-associated organisms (in vitro evidence)

Metabolic Disruption and Systemic Reach

By inhibiting PFOR pathways, nitazoxanide directly disrupts fermentation-driven gas production, which may reduce bloating and abdominal distension commonly experienced in SIBO. Another important pharmacologic distinction is systemic exposure. While rifaximin largely remains within the intestinal lumen, nitazoxanide is metabolized into tizoxanide and reaches systemic circulation, potentially allowing activity against organisms outside the immediate intestinal lumen.

Prescribers have observed clinical improvements including:

- Reduction in postprandial bloating
- Improved bowel regularity
- Fewer food intolerances
- Decreased nocturnal gastrointestinal symptoms
- Improved motility patterns

These properties make nitazoxanide a potential consideration in treatment-refractory or recurrent SIBO, particularly when protozoal involvement or biofilm activity is suspected.

DOSING CONSIDERATIONS

At Physicians Preference Pharmacy, **nitazoxanide is compounded as a sugar-free and dye-free capsule.** Nitazoxanide is indicated for patients over one year of age and dosing follows an age-based dosing strategy. Depending on the indication, the duration of treatment may be lengthened based on severity and immune competency. Administration with food is recommended to enhance absorption.

Typical adult dosing strategies may include:

PRX

NAME _____ DOB _____
ADDRESS _____ DATA _____

**Standard Protocol for SIBO:
Nitazoxanide 250 mg**
Take 2 capsules twice daily for 7–10 days

**Severe or Recurrent Cases of
SIBO: Nitazoxanide 250 mg**
Take 2 capsules three times daily for 10 days

**Diarrhea associated with
Cryptosporidium parvum:
Nitazoxanide 250 mg**
Take 2 capsules every 12 hours for 3 days

SIGNATURE _____

SAFETY PROFILE

Nitazoxanide is generally well tolerated with a low occurrence of reported adverse reactions (1–10%) including: Headache, abdominal discomfort, diarrhea, dizziness, urine discoloration (>2%), and mild rash (<1%).

Contraindication includes **hypersensitivity to nitazoxanide or formulation components**. No routine dosing adjustments are typically required for hepatic or renal impairment.

WHEN TO CONSIDER NITAZOXANIDE

Clinicians may consider nitazoxanide in the following scenarios:

- Treatment-refractory SIBO
- Mixed microbial dysbiosis
- Protozoal gastrointestinal infections
- Biofilm-associated GI infections
- Poor tolerance or response to rifaximin
- Recurrent infections after antibiotic therapy
- Influenza
- Viral respiratory infections under clinical investigation
- Parasite-associated diarrhea

Its **broad antimicrobial spectrum combined with host-directed antiviral mechanisms** continues to generate clinical interest across multiple therapeutic areas.

Our pharmacists are always available to discuss dosing

strategies, combination protocols, or formulation customization to support patient-specific therapeutic goals.

For questions about this formulation and its benefits, please contact Physicians Preference Pharmacy at **(281) 828-9088**. It would be our privilege to serve you!



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