

DOES **MEBENDAZOLE** HAVE A ROLE IN CANCER?

“Cancer” is among the most frightening of words for anyone to hear. Whether or not you are an oncologist, you have noticed that cancer numbers are on the rise and in full force. Cancer is the second most common cause of death in the United States, surpassed only by heart disease. Worldwide, cancer takes nearly 10 million lives each year. With the continual addition of oncogenic chemicals and toxins introduced into our environment, food, and water supplies, and the development of “turbo cancers” following the 2020 pandemic, cancer seems to be a new animal. Patients need your help.

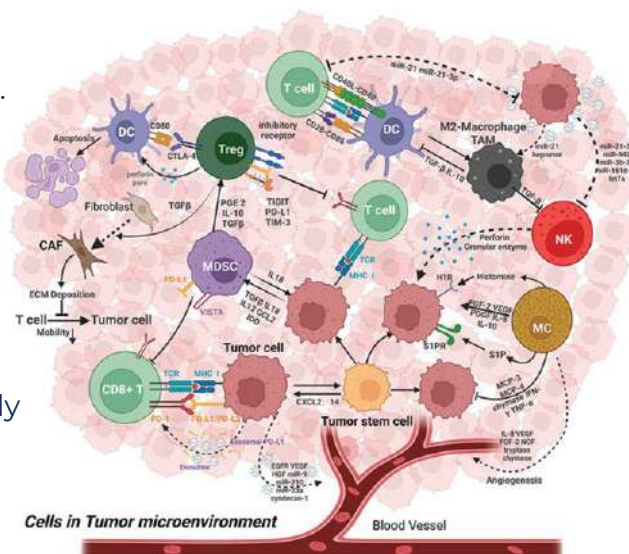
Understanding the Pathophysiology Behind Cancer

Important contributors to the homeostatic dysregulation leading to cancer development and metastasis include inflammation, apoptosis, angiogenesis, cell proliferation, glucose metabolism at a cellular level, an evolving tumor microenvironment, stem cell activity, and genetic response. One of the most overlooked of these areas, from both the fundamental understanding of cancer development as well as the conventional approach to treatment, is the metabolic reprogramming of cancer cells. In comparison to normal differentiated cells, which primarily utilize mitochondrial oxidative phosphorylation to generate energy, most cancer cells rely instead on aerobic glycolysis. This shift in metabolism, referred to as the “Warburg effect,” is where conventional cancer approaches frequently miss the mark.

Current Cancer Treatments

Current cancer treatments are complex, and many are expensive, highly toxic, and of limited benefit in terms of patient quality of life and five-year survival rate. Standard chemotherapy, for example, targets rapidly dividing cancer cells, but often adversely affects the tumor microenvironment in a way that could actually promote the proliferation of cancer stem cells, possibly increasing the potential for metastases.

Conversely, it is important to impact the tumor microenvironment (TME) in a way that may control that environment and target stem cells. As seen in the figure below, the TME is very complex and largely hinges on the functionality of immune cells, detoxification, inflammation, and cancer stem cell behavior. Enter mebendazole.



The cellular and structural components of the tumor microenvironment impacting disease and health

source: www.ncbi.nlm.nih.gov/pmc/articles/PMC10242329/

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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 48 states (excludes AL & NV). 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.

Mebendazole, a Different Approach for Cancer Patients

Mebendazole (brand name EMVERM®) is an anthelmintic drug originally developed for use in treating parasites such as hookworms, roundworms, pinworms, and whipworms. **Interestingly, parasites, cancer, and viruses all share some interesting commonalities:** They replicate, they cause inflammation, and they rely on a host. This is crucial to understanding the role of mebendazole in patients affected by parasites, viruses, cancer, and, in many cases, all three. With increasing research, there is a growing body of evidence supporting the use of mebendazole in improving health outcomes for cancer patients.

What Benefits May Mebendazole Show in Cancer?

Research reveals that mebendazole may have a variety of therapeutic effects with promising benefits for the treatment of cancer:

- May fatally disrupt cellular microtubule formation in abnormal cancer cells occurring as the cell attempts to divide
- May inhibit many factors involved in tumor progression (angiogenesis, pro-survival pathways, and multi-drug resistance protein transporters); may also inhibit cancer stem cells,

- thereby hindering metastasis
- May decrease activity of the Hedgehog pathway, which many cancers depend upon for intracellular communication
- May promote apoptosis in malignant cells
- May interfere with cancer cells' glycolysis-dependent metabolism
- May sensitize cancer cells to conventional therapy (i.e., chemo, radiation)
- Crosses the blood-brain barrier

What Cancers May Benefit from Mebendazole?

Studies have shown a wide variety of cancers are responsive to mebendazole and other benzimidazoles. They include non-small cell lung cancer, adrenocortical carcinoma, colorectal cancer, chemo-resistant melanoma, glioblastoma multiforme, colon cancer, leukemia, osteosarcoma/soft tissue sarcoma, acute myeloid sarcoma, and breast (ER+ invasive ductal), kidney, and ovarian carcinoma. Research is ongoing in this area to explore mebendazole's use in all types of cancer.

Challenges Acquiring Mebendazole

The cost of the commercially available mebendazole product EMVERM® has skyrocketed, with prices exceeding \$4,000 for just six tablets. Due to cost, many patients have been

purchasing mebendazole on the internet for lower prices, generally without proof of quality or potency. Additionally, limits have been placed on the quantity available for purchase, which is causing an interruption in treatment.

Compounded Mebendazole at Physicians Preference Pharmacy

At Physicians Preference Pharmacy, we compound mebendazole (polymorph C) in oral capsule form. Polymorph C is one of three different crystalline forms of mebendazole, known as polymorphs A, B, and C. Depending on the drug manufacturer and supplier, the amount of each polymorph will vary in the formulation. Polymorph C is often preferred due to its capability of crossing the blood-brain barrier to reach cancers in the brain, as well as its low side-effect profile. A true polymorph C formulation can be difficult to obtain.

Our compounded mebendazole (polymorph C) is a lactose- and dye-free formulation, available as 100 mg, 200 mg, and 250 mg oral capsules.

As noted by the FLCCC, recommended dosing of mebendazole is 100–200mg daily. Some providers we work with dose patients at 200mg twice daily and work them up to a dose of 1000mg daily depending on the type of cancer and severity of disease. Please call the pharmacy to discuss individualized dosing for mebendazole.

Our Commitment to You and Your Patients

Cancer requires a multifaceted approach to attack the root causes and treat the multitude of symptoms that accompany



this complex disease. In addition to metabolic and lifestyle interventions, supplements and medications should be used to address the many components of cancer development and progression, which include cancer stem cells, tumor growth and metastases, angiogenesis, immune system balance, viral involvement, and altered cancer signaling pathways. Utilizing mebendazole to support cancer patients shifts our ideas about the tumor microenvironment and how to

approach it as a whole.

Thank you for your commitment to the healing and support of patients diagnosed with cancer. With numbers on the rise, cancer will become an applicable part of every medical practice. The approaches mentioned in this article are intended to support and complement cancer patient treatment. Every patient is unique, and we want patients to be readily aware of all options available to them so they can make the most informed decisions

possible. We believe that cancer patients deserve access to clean and pure medications such as mebendazole.

Please inform your patients and colleagues about this recent availability of mebendazole at Physicians Preference Pharmacy. We encourage you to call the pharmacy today at **(281) 828-9088** to speak with a pharmacist about compounded mebendazole. It would be our pleasure to serve you!

REFERENCES

Dr. Paul Marik's *Cancer Care: The Role of Repurposed Drugs and Metabolic Interventions in Treating Cancer* is an excellent resource. It can be downloaded for free at <https://covid19criticalcare.com/wp-content/uploads/2023/06/Cancer-Care-2024-03-29-v1.pdf>.

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