



# Glutathione uses in Cancer Patients.

By Central Drug's clinical expert, *Nayan Patel, PharmD*

CENTRAL DRUGS ACADEMY presented by Central Drugs Compounding Pharmacy

GSH or Glutathione is one of the amplest antioxidants that exist in all living beings. It has various functions. Most of the time it maintains cellular redox homeostasis. It confers therapeutic resistance to the affected cells, detoxifies xenobiotics, and keeps the necessary levels of cysteine in the system.

But, Glutathione has pathogenic and useful roles in many different malignancies. Such antioxidant is the key to detoxifying and removing carcinogens. Plus, such changes in the cell can have a beneficial [effect on its survival](#).

Too much Glutathione can force the tumor to progress, which, in turn, can correlate with metastasis. The following studies will help decipher the effects of Glutathione for cancer treatment.

## The Effect of Glutathione (GSH)

Glutathione plays a crucial role in apoptosis, proliferation, and differentiation, including the disturbance in the glutathione homeostasis. [Insufficient levels of GSH](#) can make a person more vulnerable to oxidative stress due to cancer progression.

Increased levels of Glutathione can increase the resistance to oxidative stress and antioxidant capacity as [research shows](#).

For a long time, oxidative stress has been implicated in the progression and development of cancer cells, which is the sole reason why [antioxidant treatment](#) could be a solution for protecting the cells from cancer.

Other therapies, such as radiation, have been used across the world based on [research](#) that additional exudative stimulus focused on the tumor cells should force the antioxidant system to collapse. This treatment is supposed to kill the affected cells.

However, this method of treatment has recently proven unsuccessful. Most tumors at high levels manage to overpower the antioxidant enzymes. The treatment increases the levels of GSSG and keeps a much-oxidized environment. In other words, the cancer cells are [resistant](#) to the treatment doses.

## Glutathione and Cancer?

When it comes to cancer, Glutathione has a dual role. It can detoxify the system and remove carcinogens. In other words, it is crucial for the cell's survival. Higher levels of Glutathione in tumor cells can protect the cells in the larynx, bone marrow, colon, lung, and breast cancer by [granting resistance](#) to other chemotherapeutic drugs.

## How Does it Work?

Glutathione plays a [major role](#) during maintenance of intercellular redox. It takes part in important metabolic processes and even the antioxidant defense system.

Increased glutathione levels are present in multiple types of tumors. They make the tissues resistant to [chemotherapy](#). The main goal of the research was focused on depleting Glutathione by a certain inhibition of GCL – this is an enzyme of glutathione biosynthesis. In the early [clinical trials](#), BSO (buthionine sulfoximine) was the most used glutathione-depleting agent. However, due to the lack of BSO and [limited availability](#), scientists had to find other alternatives.

In more recent trials, Glutathione has been used on the anticancer agents to sensitize the tumors. By depleting Glutathione, it creates [cytotoxic effects](#).

But, now, there is a different approach to using Glutathione. This includes the binding of a nuclear factor-like [Nrf2 to the antioxidant response element](#).

It is not surprising why Glutathione has attracted scientists' attention to using it in medical treatments against chemoresistance and the progression of cancer.

It is, in fact, responsible for many important functions in our system. It is crucial for the enzymes since it acts as a "helper molecule." It balances the inflammatory reactions by producing leukotriene. Plus, it can detoxify fats from the gallbladder and liver. Lastly, it removes methylglyoxal and protects the T-cells.

However, if the body lacks Glutathione in its system, it can't benefit from it. It can't obtain its benefits.

To achieve these beneficial results, patients can use GSH supplements. These supplements might reverse or prevent cancer. A sufficient amount of glutathione levels can protect healthy cells from free radicals. These free radicals are the ones that cause the mutation.

By allowing the body to destroy the cancer cells, GSH can help fight off and prevent cancer. The human body can create its own glutathione levels. But, a deficiency of GHS is not something that is uncommon. By taking supplements rich with this antioxidant, the patient can increase the GHS levels in the system and obtain all the benefits it can offer.

Many [researchers](#) have also pinpointed a more natural way to increase the GHS levels. There are some foods that are rich in this antioxidant. Most of them are beef, broccoli, cauliflower, Brussel sprouts, and etc. In other words, foods that contain plenty of sulfur can be beneficial for boosting the GSH levels in the system.

It is also [recommended](#) that patients take vitamin C supplements, selenium, and protein. Lack of vitamins can be a huge problem for the body. That is why it is crucial to implement a diet that would include plenty of these vitamins, especially if the patient has a glutathione deficiency.

## Conclusion?

Statistics show how much antioxidants such as Glutathione are important for reversing or preventing serious illnesses such as cancer. Getting a sufficient amount of supplements rich with this antioxidant can be beneficial. All the statistics so far, have proven that GSH may be one of the most beneficial ways of dealing with cancer.

## References

1. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3756414/>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3673338/>
3. <https://www.ncbi.nlm.nih.gov/pubmed/18058573/>
4. <https://www.ncbi.nlm.nih.gov/pubmed/16357179/>
5. <https://www.ncbi.nlm.nih.gov/pubmed/18981733/>
6. <https://www.sciencedirect.com/science/article/pii/S0304416512003364>
7. <https://www.ncbi.nlm.nih.gov/pubmed/8558205>
8. <https://www.ncbi.nlm.nih.gov/pubmed/8558205>
9. <https://www.ncbi.nlm.nih.gov/pubmed/19182219>
10. <https://www.beatcancer.org/blog-posts/glutathione-and-cancer>

