**Nebulized Glutathione**

*For Lung & Respiratory-Related Conditions*

**What is Glutathione? (Pronounced “Gloota-Thigh-Own”)**

Glutathione is a potent antioxidant which acts to prevent damage to important cellular components caused by reactive oxygen species such as free radicals and peroxides. Dr. Mark Hyman, MD calls it “the mother of all antioxidants, the master detoxifier and maestro of the immune system”.

Below, is an excerpt from his article called, *Glutathione: The Mother of all Antioxidants*

> “The good news is that your body produces its own glutathione. The bad news is that poor diet, pollution, toxins, medications, stress, trauma, aging, infections and radiation all deplete your glutathione.

Glutathione is a very simple molecule that is produced naturally all the time in your body. It is a combination of three simple building blocks of protein or amino acids – cysteine, glycine and glutamine.

The secret of its power is the sulfur (SH) chemical groups it contains. Sulfur is a sticky, smelly molecule. It acts like fly paper and all the bad things in the body stick onto it, including free radicals and toxins like mercury and other heavy metals. Normally glutathione is recycled in the body – except when the toxic load becomes too great. And that explains why we are in such trouble …”

**What is a Nebulizer?**

In medicine, a nebulizer is a drug delivery device used to administer medication in the form of a mist inhaled into the lungs.

**What is Nebulized Glutathione Used For?**

GSH (reduced glutathione) inhalation is an effective treatment for a variety of pulmonary diseases and respiratory-related conditions. Even very serious and difficult-to-treat diseases yield benefits from this novel treatment. GSH inhalation is very safe. Because many pulmonary diseases and respiratory-related conditions are affected by deficient antioxidant status, poor oxygenation and/or impaired host defenses, glutathione remains an excellent choice for correcting these imbalances. In addition, glutathione is only beneficial for lung conditions when it is delivered directly to the pulmonary tissue – something that can only be achieved using a nebulizer.
This therapy may be helpful in the following conditions:

- Cystic fibrosis
- COPD
- Idiopathic pulmonary fibrosis
- Chronic otitis media with effusion
- Farmer's lung
- Bronchiectasis
- Bronchitis
- Pneumonia
- Chronic rhinitis
- Chronic sinusitis
- Chronic congestion
- Asthma
- Upper and lower respiratory tract infections
- Multiple chemical sensitivity disorder

Who is a good candidate for this therapy?

Adults and children can both benefit from nebulized glutathione. The challenge with children is two-fold: 1) they need to sit still for the duration of the treatment which lasts for 10-15 minutes and 2) they need to wear a mask that covers their nose and mouth. Parents are encouraged to bring along a book, iPad, or any other device or toy to keep their child occupied during the treatment. Parents are also welcome to hold their child or sit right beside them during the treatment.

Who is not a good candidate for this treatment?

The only strict contraindication to this treatment is a sensitivity to sulfites. Before your first treatment, a urine sample will be tested for this sensitivity. If it is determined that you are sensitive to sulfites, nebulized homeopathic remedies may still be an option.

How often are treatments required?

Typically, treatments in the beginning are required 1-2 times per week for 4-6 weeks eventually working towards a maintenance treatment plan. Maintenance plans will vary but most people require treatment as often as once every 2-4 weeks.

Many of the above listed conditions are severe and progressive or have periods of acute exacerbations. During acute flare-ups, nebulized treatments often have to be administered every few days for best results. Because of the progressive nature of many of these diseases, maintenance therapy is required.

There are no hard and fast rules in regards to how often treatments are needed. It is important to realize that a series of treatments are required to notice improvement. Your ND will continuously monitor your condition and make appropriate recommendations for the nebulized therapy based on the severity of your condition and your overall health status. Having a spirometry test before your first treatment and then periodically throughout your treatment will be recommended to determine treatment progress.
WHAT IS THE COST OF THE THERAPY?

The cost of each session will vary depending upon what was included in the treatment. The dosage of glutathione is determined based on the condition being treated and that dosage may change from treatment to treatment. Additional costs will be incurred if homeopathic remedies are included in the treatment. Your ND will explain the expected cost to you. Nebulized treatments vary from $50-$100 depending on the ingredients and the dosages that are administered.

The first treatment will involve two urine tests to rule out a sensitivity to sulfites. These urine tests need only to be completed once and range from about $20-$30.

The treatment is delivered using a mask which costs $5.

ARE THERE ANY SIDE-EFFECTS?

Mild coughing and smelling a slight sulphurous odour are possible but subside after the treatment is complete.

ARE THERE ANY RISKS?

An allergic reaction is possible if you are sensitive to sulfites but this will be ruled out with the urine test mentioned above. Otherwise, nebulized glutathione is very safe.

HOW DO I ACCESS THIS THERAPY?

This therapy only exists for patients of Sunrise Health Services that are currently under the care of one of our four naturopathic doctors. If you see an ND at our office, you can ask her more about the therapy to determine if it is right for you.

If you are not a naturopathic patient at our clinic, you will need to have an initial visit with one of our NDs before you can begin this therapy. Please call our office at 519-271-0763 to book an initial appointment.

IS THERE ANY RESEARCH TO SUPPORT THIS THERAPY?

At Sunrise Health Services, we pride ourselves on using evidence-based medicine. Below you will find research articles that provide evidence of the effectiveness and rationale for this treatment. These are written in medical language, not really intended for the lay person, but included for the purpose of discussion with your other health care providers, such as your MD.

1 | The Use of Nebulized Glutathione in the Treatment of Emphysema: a Case Report
by Davis W. Lamson, ND and Matthew S. Brignall, ND.

Abstract: We present the case of a 95-year-old man with an acute respiratory crisis secondary to emphysema and apparent bronchial infection. Treatment with nebulized glutathione led to a rapid resolution of the crisis, as well as a marked improvement in the chronic course of the disease. This treatment has been used since for a number of patients with emphysema. The safety and bioavailability of this method of delivery have been established in human studies. Preliminary results suggest efficacy for nebulized administration of glutathione in this patient population. We suggest this treatment can be considered an option for acute respiratory crises due to COPD.

› Click here for the full article.
The Treatment of Pulmonary Diseases and Respiratory-Related Conditions with Inhaled (Nebulized or Aerosolized) Glutathione by Jonathan Prousky, ND.

Abstract: Reduced glutathione or simply glutathione (γ-glutamylcysteinylglycine; GSH) is found in the cytosol of most cells of the body. GSH in the epithelial lining fluid (ELF) of the lower respiratory tract is thought to be the first line of defense against oxidative stress. Inhalation (nebulized or aerosolized) is the only known method that increases GSH's levels in the ELF. A review of the literature was conducted to examine the clinical effectiveness of inhaled GSH as a treatment for various pulmonary diseases and respiratory-related conditions. This report also discusses clinical and theoretical indications for GSH inhalation, potential concerns with this treatment, its presumed mechanisms of action, optimal doses to be administered and other important details. Reasons for inhaled GSH's effectiveness include its role as a potent antioxidant, and possibly improved oxygenation and host defenses. Theoretical uses of this treatment include Farmer's lung, pre- and postexercise, multiple chemical sensitivity disorder and cigarette smoking. GSH inhalation should not be used as a treatment for primary lung cancer. Testing for sulfites in the urine is recommended prior to GSH inhalation. Minor side effects such as transient coughing and an unpleasant odor are common with this treatment. Major side effects such as bronchoconstriction have only occurred among asthma patients presumed to be sulfite-sensitive. The potential applications of inhaled GSH are numerous when one considers just how many pulmonary diseases and respiratory-related conditions are affected by deficient antioxidant status or an over production of oxidants, poor oxygenation and/or impaired host defenses. More studies are clearly warranted.

Click here for the full article.

A Pilot Study of the Effect of Inhaled Buffered Reduced Glutathione on the Clinical Status of Patients With Cystic Fibrosis by Clark Bishop, MD, Valerie M. Hudson, PhD, Sterling C. Hilton, PhD, Cathleen Wilde, BS.

Abstract: Study objectives: To assess the impact of inhaled, buffered reduced glutathione (GSH) on clinical indicators of cystic fibrosis (CF) pathophysiology.

Design and patients: A randomized, double-blind, placebo-controlled pilot study was conducted over an 8-week period. Nineteen subjects, age 6 to 19 years, with CF status documented by positive sweat chloride test results (> 60 mEq/L) were recruited for the trial. After matching on age and sex, 10 patients were randomly assigned to the treatment group and 9 patients to the placebo group. Primary outcomes were FEV1, FVC, forced expiratory flow at 25 to 75% of vital capacity, and peak flow; secondary outcomes were body mass index, 6-min walk distance, and self-reported cough frequency, mucus production/viscosity/color, wellness, improvement, and stamina.

Interventions and analysis: Treatment was buffered GSH, and placebo was sodium chloride with a hint of quinine. The total daily dose of buffered GSH was approximately 66 mg/kg of body weight, and the total daily dose of placebo was approximately 15 mg/kg of body weight (quinine, 25 to 30 μg/kg). Doses were distributed across four inhalation sessions per day and spaced 3- to 4-h apart. General linear mixed models were used to analyze the data. The final sample size was nine subjects in the treatment group and seven subjects in the placebo group.

Results: Mean change for peak flow was - 6.5 L/min for the placebo group and + 33.7 L/min for the GSH group (p = 0.04), and self-reported average improvement on a scale from 1 to 5 (1 being much worse and 5 being much better) was 2.8 for placebo and 4.7 for GSH (p = 0.004). Of the 13
primary and secondary outcomes examined, 11 outcomes favored the treatment group over the placebo group (p = 0.002), indicating a general tendency of improvement in the GSH group. No adverse events in the treatment group were noted.

Conclusion: This pilot study indicates the promise of nebulized buffered GSH to ameliorate CF disease, and longer, larger, and improved studies of inhaled GSH are warranted.

Click here for the full article.

Effect of inhaled glutathione on airway response to 'Fog' challenge in asthmatic patients
by Purello D'Ambrosio F.

Abstract:

Objective: We report on the effect of glutathione, an antioxidant compound on the airway response to the ultrasonically nebulised distilled water (UNDW, 'fog') challenge.

Methods: 12 subjects with mild-to-moderate bronchial asthma underwent double-blind, cross-over pretreatment, administered 30 min earlier, in a randomised order with inhaled glutathione (G) (600 mg), sodium cromoglycate (SCG) (20 mg) and placebo (P), followed by the challenge.

Results: After P pretreatment UNDW challenge caused a mean 20.41% decrease in FEV-1 (p < 0.05), after G, a mean 6.04% fall in FEV-1 (p = n.s.), and after SCG a mean 5.99% fall in FEV-1 (p = n.s.).

Conclusions: G significantly attenuated 'fog'-induced falls in FEV-1 (p < 0.001 compared with P) and showed a protective effect on UNDW-induced bronchoconstriction.

Click here for the full article.