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Research Protocols

Longevity

Glutathione/Magnesium Sulfate

About

Glutathione Magnesium is a potent antioxidant blend studied for its ability to support detoxification, protect cells from oxidative stress, and enhance immune function.

What's Included

- Two vials, concentration: 50mg/12.5mg
- One vial will last two weeks; two vials will last one month

Contraindication: sulfa allergy

Reconstitution kit

- (20) 29-30G subq needles
- (1) 5mL syringe
- (1) 25G needle with syringe
- (1) 10 mL bacteriostatic water

Clinical Research Potential Benefits:

- May support liver detoxification and cellular protection
- May reduce oxidative stress and inflammation
- May enhance immune system resilience
- May help reduce cellular damage in liver-related conditions

Clinical Research Suggested Use:

- Draw 50 units (25mg/6.5.mg) into the syringe
- Administer once per week
- Duration: 3 months
- Reconstitute: add 1mL of bacteriostatic water into the to the lyophilized powder vial
- Injection type: subcutaneous injection

Reconstitution & Administration*

*Instructions start on page 2

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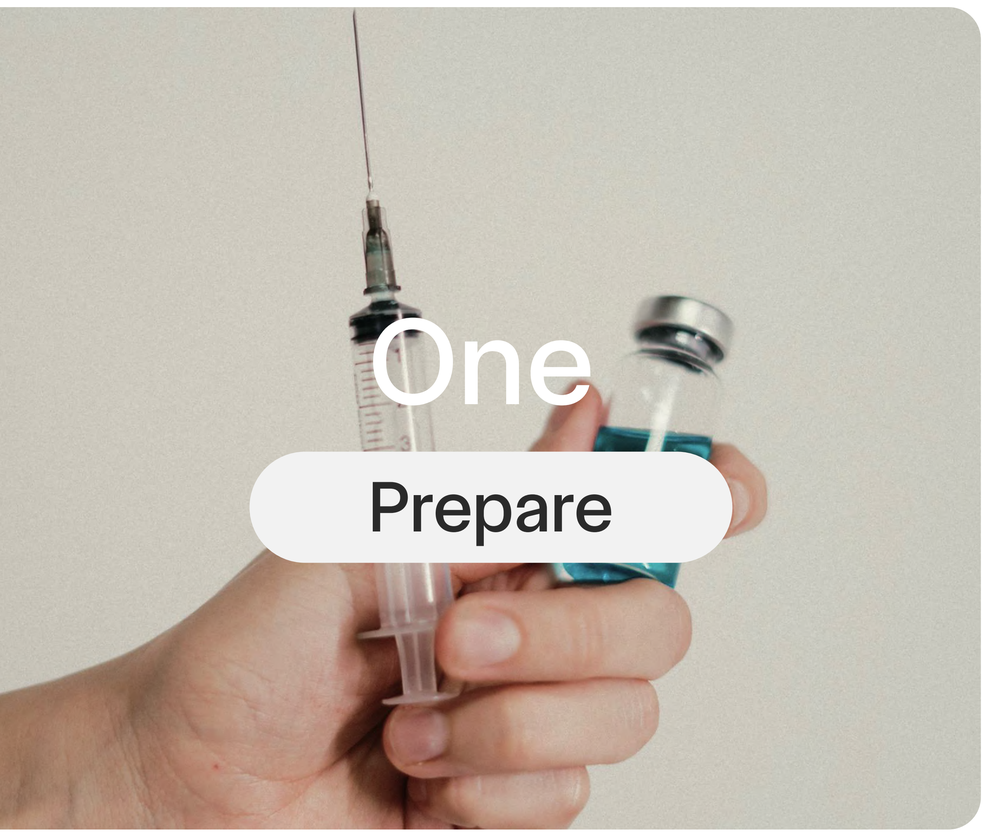
Glutathione/Magnesium Sulfate Reconstitution



STEP 1: Remove plastic covers, clean Glutathione/Magnesium vial and bacteriostatic water top with an alcohol pad for 15 seconds

STEP 2: Using the large syringe from your administration kit, pull out 1mL of bacteriostatic water

- It may take a few repetitions to load your syringe with the 1mL with no air pockets

STEP 3: Once you've loaded your syringe, slowly inject the 1mL of Bacteriostatic water into your Glutathione/Magnesium vial:

- On its side to not damage the bonds of the product
- Do not shake, gently swirl if needed
- Allow the solution to sit for at least 5 minutes

***Supplies:** 5 mL syringe (large), 25G needle, Bacteriostatic water, Glutathione / Magnesium vial, Alcohol pad

STEP 1: With the smaller needle draw up 50 units of the Glutathione/Magnesium into the small syringe from your kit

***Supplies:** 29G-30G subcutaneous syringe with needle (small), Alcohol pad

STEP 1: Clean the injection area with an alcohol pad.

STEP 2: Inject subcutaneously (see pg 3)

- Administer 1x per week
- Duration: 3 months
- One vial will last two weeks; two vials will last one month

****Precautions:** Contraindicated in individuals with a sulfa or sulfur allergy.**

Injection Steps

Subcutaneous Injection steps:

1 Choose & Clean the Injection Site

- Use the abdomen (3 inches from the belly button), thigh, or upper arm. Rotate sites to prevent irritation. Clean the area with an alcohol swab and let it dry.

2 Inject

- Pinch 1 to 2 inches of skin, insert the needle at a 90° angle, and slowly push the plunger down.

3 Remove the Needle & Dispose

- Pull the needle out at the same angle, apply light pressure with gauze (don't rub), and dispose of the syringe in a sharps container.

4 Monitor for Reactions

- Mild redness or soreness is normal. Seek medical help if you experience severe pain, swelling, or an allergic reaction.

Intramuscular Injection steps:

1 Choose & Clean the Injection Site

- Use the thigh (vastus lateralis), upper arm (deltoid), or glute (ventrogluteal or dorsogluteal muscle).
  - Rotate sites to prevent soreness. Clean the area with an alcohol swab and let it dry.

2 Inject

- Stretch the skin taut, hold the syringe like a dart at a 90° angle, and insert the needle quickly and smoothly. Slowly push the plunger down to inject.

3 Remove the Needle & Dispose

- Pull the needle straight out, apply light pressure with gauze (don't rub), and dispose of the syringe in a sharps container.

4 Monitor for Reactions

- Mild soreness or redness is normal. Seek medical help if you experience severe pain, swelling, or an allergic reaction.

Glutathione/Magnesium Sulfate Mechanism of Action

Glutathione:

- Master Antioxidant and Cellular Defense:
  - Glutathione (GSH) is a tripeptide composed of cysteine, glycine, and glutamate that serves as the body's primary intracellular antioxidant. It directly neutralizes reactive oxygen species (ROS) and reactive nitrogen species, protecting cells from oxidative damage and maintaining redox balance.

- Detoxification and Liver Support:
  - Within the liver, glutathione plays a critical role in phase II detoxification, conjugating toxins and facilitating their elimination through bile and urine. It supports hepatic resilience against oxidative injury, environmental toxins, and drug metabolism stress.

- Mitochondrial Protection and Energy Support:
  - Glutathione preserves mitochondrial membrane integrity and prevents oxidative damage to mitochondrial DNA and proteins. By sustaining ATP production and reducing oxidative load, it maintains efficient cellular energy metabolism.

- Immune and Inflammatory Modulation:
  - Through redox-sensitive signaling, glutathione regulates immune cell activation, cytokine balance, and inflammatory responses. Optimal glutathione levels enhance immune function and protect against chronic inflammation-related tissue damage.

- Regeneration and Antioxidant Recycling:
  - Glutathione regenerates oxidized forms of other antioxidants, such as vitamins C and E, maintaining a robust antioxidant network. This continuous redox cycling supports systemic cellular protection and longevity.

Glutathione/Magnesium Sulfate Mechanism of Action

Magnesium:

- Cofactor in Energy Production:
  - Magnesium is an essential mineral required for more than 300 enzymatic reactions, including those involved in ATP synthesis. It forms magnesium-ATP (Mg-ATP), the active energy complex used in virtually all cellular processes, ensuring metabolic stability and optimal mitochondrial output.

- Glutathione Biosynthesis Support:
  - As a key enzymatic cofactor, magnesium is required for glutathione synthesis, supporting the formation of γ-glutamylcysteine synthetase and glutathione synthetase. Adequate magnesium levels are essential for maintaining intracellular antioxidant capacity.

- Neuromuscular and Cellular Stability:
  - Magnesium regulates calcium and potassium ion transport, stabilizing excitable cell membranes in the nervous and muscular systems. This action reduces neuromuscular excitability, supports relaxation, and prevents oxidative stress-induced cellular injury.

- Detoxification and Metabolic Function:
  - Magnesium supports liver enzyme function, bile secretion, and metabolic detoxification pathways. It also contributes to glucose regulation, lipid metabolism, and protein synthesis, enhancing systemic metabolic efficiency.

- Anti-Inflammatory and Cytoprotective Effects:
  - By suppressing NF-κB signaling and reducing pro-inflammatory cytokines, magnesium helps modulate inflammation and oxidative stress. It protects against cellular injury, vascular dysfunction, and metabolic imbalance, contributing to overall tissue resilience and longevity.