NAC & GLUTATHIONE

YOUR MASTER ANTIOXIDANT SYSTEM

How they work, who benefits, and which forms to choose

The master antioxidant system: Glutathione is the most powerful antioxidant your body produces, present in virtually every cell. NAC (N-acetyl cysteine) is its direct precursor: your body uses NAC to make glutathione. Together, they form one of the most important detoxification and cellular protection systems in the body.

HOW THEY WORK TOGETHER

1. NAC supplies the building block

NAC delivers cysteine, the scarce ("rate-limiting") amino acid your body needs to make glutathione.

2. Your cells build glutathione

Inside the cell, cysteine joins glycine and glutamate to form glutathione (GSH).

3. Glutathione protects & detoxes

It neutralizes free radicals, recycles vitamins C and E, and binds toxins and heavy metals for removal.

Why take both? Glutathione is poorly absorbed when swallowed as a standard capsule; digestion breaks most of it down before it reaches your cells. NAC gets around this by helping your cells make their own glutathione. **Liposomal and IV glutathione are the exceptions**, because these forms deliver it intact.

NAC: THE PRECURSOR & PROTECTOR

What NAC Is & How It Works

NAC is a modified form of the amino acid cysteine. It also acts as an antioxidant and mucus-thinning (mucolytic) agent in its own right.

Primary mechanisms

- Replenishes cysteine to drive glutathione production
- Scavenges free radicals on its own
- Breaks the bonds that make mucus thick and sticky
- Supports Phase II liver detox pathways
- Helps regulate glutamate signaling in the brain
- Supports mitochondrial function and energy production

Lungs & Breathing

- Thins and loosens mucus in the airways; long used in lung care
- Reduces oxidative stress and inflammation in the airways
- Supports recovery from respiratory infections
- May improve symptoms in chronic bronchitis and COPD

Liver & Detoxification

- The standard hospital treatment for acetaminophen (Tylenol®) overdose
- Protects liver cells from oxidative and toxic damage
- Supports Phase II liver detox (sulfation, conjugation)
- Essential support during chelation and heavy metal detox
- May reduce liver inflammation and fibrosis markers

Brain, Mood & Nervous System

- Reduces neuroinflammation and oxidative stress in the brain
- Helps balance glutamate, the brain's main "excitatory" messenger
- Studied for OCD, addiction, compulsive behaviors, and PTSD
- May ease anxiety and depressive symptoms
- May help protect against cognitive decline
- Supports healthy dopamine function

Immune & Cardiovascular

- Supports immune cells, especially T-cells and NK cells
- May lower inflammatory markers (CRP, IL-6)
- Supports healthy blood vessel function
- May improve insulin sensitivity and blood sugar
- Helps protect LDL cholesterol from oxidative damage

GLUTATHIONE: THE MASTER ANTIOXIDANT

What Glutathione Is & How It Works

Glutathione (GSH) is a small peptide made from three amino acids: cysteine, glycine, and glutamate. It is the body's primary antioxidant, detoxifier, and immune regulator inside the cell.

Primary mechanisms

- Neutralizes free radicals directly
- Regenerates vitamins C and E
- Binds heavy metals and toxins for removal
- Drives Phase II liver detoxification
- Regulates immune activity and inflammation
- Protects mitochondria from oxidative damage
- Recycles itself between its active (GSH) and used (GSSG) forms

Detox & Liver

- Main carrier for flushing heavy metals and toxins out through bile
- Binds toxins in Phase II detox, including mercury, lead, and arsenic
- Protects liver cells from alcohol, medication, and chemical damage
- Reduces liver inflammation; supports regeneration
- Critical support for any chelation or detox protocol

Brain & Nervous System

- The brain uses a lot of oxygen and is especially vulnerable to oxidative stress, so it depends heavily on glutathione
- Protects neurons from oxidative damage and neuroinflammation
- Found to be low in Parkinson's, Alzheimer's, and ALS; IV glutathione has been studied for Parkinson's, with mixed results
- Supports blood-brain barrier integrity and mitochondrial health in neurons
- Many patients report clearer thinking and less brain fog

Immune, Skin & Longevity

- Regulates T-cell and natural killer (NK) cell activity
- Helps calm chronic inflammatory signaling
- Has shown antiviral activity in lab studies
- Brightens skin by reducing melanin production and oxidative skin damage
- Supports collagen and wound healing

Metabolic & Cardiovascular

- Low glutathione is linked to insulin resistance and type 2 diabetes risk
- Protects blood vessels and heart tissue from oxidative damage
- Supports mitochondrial energy production
- May slow atherosclerosis (plaque) progression
- Supports healthy red blood cells
- Helps lower systemic inflammation

SIGNS YOUR LEVELS MAY BE LOW

Common signs

- Persistent fatigue and low energy
- Frequent illness or slow recovery
- Chemical sensitivities or reactions to medications
- Brain fog and poor concentration
- Chronic muscle aches and inflammation
- Skin concerns: premature aging, slow healing
- Trouble processing alcohol or medications
- Dark circles, pallor, early signs of aging

Conditions linked to low glutathione

- Chronic fatigue syndrome / fibromyalgia
- Autoimmune conditions
- Heavy metal or chemical toxicity
- Mold illness (CIRS)
- Neurodegenerative disease
- Chronic infections
- Type 2 diabetes and metabolic syndrome
- Liver disease (NAFLD, cirrhosis)

These signs are common and have many possible causes, so we look at the whole picture with you rather than assuming one cause.

WHO BENEFITS MOST

NAC is especially valuable for:

- Anyone undergoing chelation or heavy metal detox
- Respiratory conditions: bronchitis, COPD, post-infection recovery
- Liver support with high medication or alcohol use
- Mood and mental health: OCD, anxiety, addiction patterns
- Neurological support and brain fog
- High oxidative stress or inflammation
- Low cysteine intake from diet

Glutathione is especially valuable for:

- Detox and chelation protocols: essential for metal excretion
- Mold illness / CIRS (mycotoxins deplete glutathione)
- Neurological conditions and brain protection
- Immune dysfunction or chronic infections
- Autoimmune conditions
- High toxic burden: chemical, environmental, medication
- Fatigue that hasn't responded to other treatments
- Skin health and healthy aging

FORMS & DOSING

NAC oral capsules

Typical dose: 600 mg, 1–2× daily

- Take away from heavy meals for best absorption
- Time it with chelation and detox protocols
- Your provider may adjust the dose for you

Glutathione delivery matters

How you take glutathione makes a big difference in how much reaches your cells. Take it **away from food** for best absorption.

Using **NAC and glutathione together** works better than either alone.

Glutathione Forms Compared

Form	How it works	Absorption
Standard oral capsule	Largely broken down in the gut before it can be absorbed	**Poor**
Liposomal (e.g., Readisorb®, Quicksilver Scientific®)	Wrapped in a protective fat layer so it arrives intact. **Our preferred oral form.**	**Good**
Sublingual	Dissolves under the tongue, bypassing digestion	**Good**
IV push (in office)	Delivered straight into the bloodstream. Used for detox and acute protocols.	**Highest**

Ask us about: adding a glutathione IV push to your chelation or IV therapy sessions, available weekly, for enhanced detox and antioxidant support.

SAFETY NOTES

NAC and glutathione are generally well tolerated. Mild stomach upset is the most common side effect of NAC. **Please tell us before starting if you:**

- Have asthma, as NAC and glutathione can occasionally trigger airway tightening in sensitive people (mainly when inhaled)
- Take nitroglycerin or other nitrates, or blood thinners
- Are pregnant or breastfeeding
- Have a sulfur or sulfite sensitivity
- Are scheduled for surgery

NAC builds it. Glutathione uses it. *Together they form one of the most important antioxidant and detoxification systems in the body: protecting your cells, helping clear toxins, and keeping your immune system sharp.*

This handout is for educational purposes and is not a substitute for individualized medical advice. Talk with your provider about which forms and doses are right for you.

Tecaya Health | Larrea Naturopathic Medicine · 1601 N. Tucson Blvd., Suite 8, Tucson, AZ 85716 · 520-222-6208