
N-ACETYLCYSTEINE (NAC) Fact Sheet [G]

Bottom Line:

NAC is a glutamate modulator and is derived from the amino acid cysteine. It has been tested for many psychiatric conditions, but is most likely effective as an add-on treatment to SSRIs in OCD, trichotillomania, nail biting, and skin picking.

FDA Indications:

None.

Off-Label Uses:

OCD; trichotillomania; nail biting; skin picking.

Dosage Forms:

Capsules: 500 mg, 600 mg, 750 mg, 1000 mg.

Dosage Guidance:

NAC doses studied have ranged from 600 mg to 6000 mg/day, with the majority of the studies using 1200–2400 mg/day. Divide dose BID to minimize GI side effects.

Monitoring: No routine monitoring recommended unless clinical picture warrants.

Cost: \$

Side Effects:

- Most common: Usually well tolerated with nausea/vomiting, diarrhea, cramping, flatulence being most common.
- Serious but rare: May exacerbate asthma.
- Pregnancy/breastfeeding: Considered relatively safe.

Mechanism, Pharmacokinetics, and Drug Interactions:

- NAC is derived from the amino acid cysteine, a precursor of a key brain antioxidant, glutathione. It works as a glutamate modulator, which may have effects on oxidative stress, mitochondrial dysfunction, inflammatory mediators, neurotransmission, and neural plasticity.
- Metabolized extensively by liver with minimal CYP450 involvement; $t_{1/2}$: 6 hours.
- No known drug interactions; not likely an issue for the majority of patients.

Clinical Pearls:

- Amino acid derivative with antioxidant properties.
- NAC is most recognized for its use as a treatment for acetaminophen overdose.
- Although NAC has been studied in autism, Alzheimer's, cocaine and cannabis addiction, bipolar disorder, depression, trichotillomania, nail biting, skin picking, OCD, and schizophrenia, the results are generally mixed. Best data are in patients with OCD, trichotillomania, nail biting, and skin picking (including Prader-Willi syndrome).
- Most patients develop tolerance to GI symptoms, and they go away after a few weeks.
- No long-term data; most studies were eight weeks long, and a few followed patients for three to six months.

Fun Fact:

Many of the published studies have come from an individual Australian researcher who holds a patent on a particular formulation of NAC, raising the issue of bias or a potential conflict of interest.