

## DISCLOSURE AND DISCLAIMER

- 1) The information that follows from Donnay Detoxicology LLC contains links to collections of peer-reviewed articles about carbon monoxide that open webpages of the US National Library of Medicine at [www.pubmed.ncbi.nlm.nih.gov](http://www.pubmed.ncbi.nlm.nih.gov). From the PubMed site--over which Donnay Detoxicology LLC has no control--you can save or export the articles in the collections.
- 2) The articles in each collection were selected by Albert Donnay, a consulting toxicologist who has specialized in CO poisoning since 1999. He selected the articles for their relevance to the topics and not for their accuracy, integrity, clinical utility, or any other reason.
- 3) The collections are not regularly updated and so only should be considered illustrative, not exhaustive. To find more recent articles on any topic "X", you can search at [www.pubmed.gov](http://www.pubmed.gov) for ("carbon monoxide" and "X")
- 4) *By clicking on the links provided below to any of Donnay's collections, you acknowledge this disclosure and agree not to hold Albert Donnay or Donnay Detoxicology LLC responsible for any false, misleading, or outdated information that the selected articles may contain.*

For more information on Donnay Detoxicology's library of over 1,500 PubMed collections on CO-related topics, see [www.tinyurl.com/COpapers](http://www.tinyurl.com/COpapers)

# Donnay Detoxology LLC

[www.DonnayDetox.com](http://www.DonnayDetox.com)

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## **CARBON MONOXIDE CONDITIONS: CHRONIC FATIGUE SYNDROME**

Chronic Fatigue Syndrome, also known as ME, SEID and originally neurasthenia, may be caused or worsened by exposure to either inhaled and/or internal carbon monoxide. The fatigue is caused by cytochromes in mitochondria binding with CO in place of oxygen so they can no longer produce energy.

[Note most internal CO is produced endogenously 24/7 from the normal breakdown of heme proteins by heme oxygenase-1 and -2. When combined with 3 oxygen molecules and catalyzed by an enzyme called NADPH, HO-1 and -2 convert heme into equal parts of CO, bilirubin, and ferritin, along with hydrogen from the NADPH. If the heme protein is bound to CO when it is broken down, that CO also is released, which doubles the total. While acute exposure to high levels of CO causes symptoms of CO toxicity, and chronic exposure to low levels causes symptoms of CO deficiency, there is a range of CO exposure in between that endogenous CO research shows is more beneficial than harmful.]

For a collection of peer-reviewed articles on PubMed curated by Albert Donnay about the impact on CFS of

**INTERNAL (ENDOGENOUS) CO**, see

<https://www.ncbi.nlm.nih.gov/sites/myncbi/donnaydetoxologyllc/collections/60483699/public/>

**INHALED (EXOGENOUS) CO**, see

<https://www.ncbi.nlm.nih.gov/sites/myncbi/donnaydetoxologyllc/collections/60483662/public/>