

## CARBON DIOXIDE EXPOSURE EFFECTS – FACT SHEET

Studies by NIOSH in 1976 dispelled the myth that carbon dioxide is an asphyxiant gas and only causes adverse health effects when it displaces oxygen.

Symptoms of overexposure by inhalation include dizziness, headache, nausea, rapid breathing, shortness of breath, deeper breathing, increased heart rate (tachycardia), eye and extremity twitching, cardiac arrhythmia, memory disturbances, lack of concentration, visual and hearing disturbances (including photophobia, blurred vision, transient blindness, hearing loss and ringing in the ears), sweating, restlessness, vomiting, shaking, confusion, flushed skin, panic, parathesis (a sensation of numbness in the extremities), disorientation, convulsions, unconsciousness, coma, and death.

CO <sub>2</sub> Concentration	Duration	Physiological Impact/Health Effect
1,000 ppm	Less than 2½ hrs.	Impairs judgment, decision-making ability, and thinking skills on a short-term basis, even for healthy individuals.
2,500 ppm	Less than 2½ hrs.	Many individuals are rendered cognitively marginal or dysfunctional.
5,000 ppm with 20.9% Oxygen		Headache, lethargy, mental slowness, emotional irritation, and sleep disruption.
6%	1-2 mins.	Hearing and visual disturbances
7% (70,000 ppm) with 20.9% Oxygen	5 mins.	death
10% to 15%		Dizziness, drowsiness, severe muscle twitching, unconsciousness and death within a few minutes.
17% to 30%	Within 1 min.	Loss of controlled and purposeful activity, unconsciousness, coma, convulsions, and death
30% carbon dioxide, with 70% oxygen	30 secs.	Unconsciousness, with some subjects having seizures that were characterized as decerebrate (no cerebral functioning).

*Even though oxygen is necessary to carry out cell functions, **it is not the lack of oxygen that stimulates breathing. Breathing is stimulated by an excess of CO<sub>2</sub>.*** If an individual breathes too slowly (bradypnea), does not breathe deeply enough, (dyspnea), or is exposed to excessive CO<sub>2</sub> levels, too much CO<sub>2</sub> can build up. This causes increased breathing and the other physiological responses discussed above.

Concentrated CO<sub>2</sub> conditions impact most living organisms. Plant roots can actually be suffocated, which stops the uptake of nutrients and kills the plants.