

Carbon Monoxide Poisoning

START AS SOON AS POSSIBLE — treated within 6 h in the best cohort data

Hyperbaric oxygen is given to reduce delayed neurocognitive sequelae, not merely to clear carboxyhaemoglobin faster.

TREATMENT PROTOCOL

Pressure	3.0 ATA for the first session, then 2.0 ATA. Sessions two and three at 2.0 ATA
Duration	60 min at 3.0 ATA with two 5-min air breaks, then 60 min at 2.0 ATA with one air break. The manual states 60, 90 and 140 min in three different places
Frequency	First session as soon as possible, then at 6–12 h intervals
Sessions	3 within 24 h was the trial dose. Most units give a single session
Review	No treatment-count trigger; the manual's review section recommends 2.5–3 ATA

PATIENT SELECTION

Who to treat	Transient or prolonged unconsciousness, neurological signs, cardiovascular dysfunction or severe acidosis, regardless of the carboxyhaemoglobin level. COHb of 25% or more is a reasonable referral threshold. Pregnancy lowers the threshold.
Who not to treat, or when to stop	No disease-specific contraindication — this is an emergency. Stabilise airway and cardiac status first but do not delay treatment. Raphael 1989 found no benefit in patients who never lost consciousness. In ventilated patients, exclude pneumothorax before compression and manage the ventilator through decompression: a fatal pulmonary barotrauma with arterial gas embolism has been reported on leaving the chamber (Liu 2026, JACEP Open 7:100529; DOI 10.1016/j.acepjo.2026.100529).
Mechanism	Halves the carboxyhaemoglobin half-life (26.3 vs 71.3 min, volunteers at 1.58 ATA); improves mitochondrial function; inhibits lipid peroxidation; reduces leucocyte adhesion to injured microvasculature; reduces brain inflammation from myelin-basic-protein adduct formation.
Outcome measure	Cognitive sequelae at 6 weeks and 12 months; incidence of delayed neurological sequelae; neuropsychological scores.

WHAT THE NUMBERS SHOW

- Weaver 2002 NEJM (n=152, double-blind, sham-controlled): cognitive sequelae at 6 weeks 25.0% vs 46.1%, P=0.007 (adjusted OR 0.45, 95% CI 0.22–0.92); benefit sustained at 12 months.
- Thom 1995 (n=60): delayed neurological sequelae 0/30 vs 7/30 (23%), P<0.05 in mild to moderate poisoning.
- Lee 2021 (propensity-matched, n=706): treatment within 6 h gave significantly better 6-month neurocognitive outcomes than 6–24 h, with a dose-response by delay.
- Raphael 1989 (n=629): recovery 68% with HBO vs 66% without in patients who never lost consciousness — no benefit.
- Buckley 2011 Cochrane: pooled OR 0.78 (95% CI 0.54–1.12) — not significant.

EVIDENCE BASE

Shape and certainty	Multiple randomised trials exist and they disagree. Positive: Weaver 2002, Thom 1995, Ducasse 1995. Negative: Raphael 1989, Scheinkestel 1999, Annane 2011. The meta-analyses lean predominantly null.	
Study	Design	Result and risk of bias
Weaver 2002, NEJM — PMID 12362006	Double-blind sham-controlled RCT, n=152	Positive — the pivotal trial
Thom 1995, Ann Emerg Med — PMID 7710151	Assessor-blinded RCT, n=60	Positive
Raphael 1989, Lancet — PMID 2569600	RCT, n=629	Negative
Buckley 2011, Cochrane — PMID 21491385	Meta-analysis	Not significant
Fujita 2026, Acute Med Surg — PMID 41624627	SR / meta of 6 RCTs	No significant benefit; GRADE low to very low

WHAT THE EVIDENCE DOES NOT SUPPORT

Cautions	The meta-analytic picture is predominantly null, including at 2.5 ATA and above. Raphael 1989 found no benefit without loss of consciousness (Thom 1995, n=60, disagrees). Two sessions did worse than one in coma in Annane 2011; Wang 2019 and Ho 2022 re-pool those trials, whose two-session arms were sicker. Weaver's own 2023 trial found three sessions no better than one. Direct evidence in isolated cyanide poisoning is anecdotal.
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STATUS AND SOCIETY POSITIONS

Status	Accepted indication in South Africa (SAUHMA Level A, citing methodological differences between the trials). PMB pathway via the toxic-effect-of-gases diagnosis-treatment pair, which maps directly.
ICD-10 (SA)	T58, G93.4
ECHM 2017 (Type, Level)	1B, whatever the COHb, with neurological, cardiac, respiratory or psychological signs

Compiled from the UHMS Hyperbaric Oxygen Therapy Indications Manual, 15th edition (2023) and the appraised trial evidence held in an HBOT evidence library. All treatments are 100% oxygen. US Navy Treatment Table profiles are named, not reproduced — the US Navy Diving Manual is the operative document at the chamber. Session counts are largely guideline convention rather than dose-finding evidence. This card summarises published parameters and does not replace those source documents or clinical judgement for the individual patient. Generated 28 October 2026. Not a SAUHMA publication and carries no society endorsement.