Arterial and Cerebral Gas Embolism

START IMMEDIATELY — every hour of delay costs outcome

Emergency recompression is the established standard of care for symptomatic arterial or venous gas embolism, whether from diving or an iatrogenic procedure.

TREATMENT PROTOCOL

Pressure	**2.82 ATA** (60 fsw / 18 msw) on 100% oxygen — USN Treatment Table 6. Initial compression to 6 ATA was formerly advised and is no longer recommended; deeper recompression remains an expert-unit option if the response is poor
Duration	Per the Table 6 profile
Frequency	Repeat until there is no further stepwise improvement
Sessions	**1–2 typically**; occasionally 5–10
Review	After 10 treatments

PATIENT SELECTION

Who to treat	Sudden focal neurological deficit, seizure, loss of consciousness or cardiovascular collapse within minutes of a gas-introducing procedure or a diving ascent. **The diagnosis is clinical — imaging is never required before treatment.**
Who not to treat, or when to stop	Treat an untreated tension pneumothorax first. Standard hyperbaric contraindications apply. **No futility criterion — do not abort a late referral on time grounds**, benefit is documented well beyond 6 h and up to days.
Mechanism	Boyle's law compresses the bubble to about 36% of its volume at 2.8 ATA and 17% at 6.0 ATA. The oxygen window (pO2 above 1,500 mmHg) speeds inert-gas washout. Dissolved oxygen sustains ischaemic tissue downstream until the bubble clears.
Outcome measure	Neurological recovery, Glasgow Outcome Scale, mortality, quality of life.

WHAT THE NUMBERS SHOW

- **Fakkert 2023 IPD meta-analysis** (n=263, 126 individual patients from 8 studies): time to HBOT predicted a favourable outcome, **p=0.013** (p=0.041 adjusted). Good-outcome probability fell from **about 65% treated immediately to about 30% at 15 h**.
- **Beevor 2016** (n=45): time to HBOT was the **only independent predictor** of good outcome, **OR 0.94 per hour**; mortality 8.9%.
- **Blanc 2002** (n=86, all treated): HBO within 6 h gave better outcomes in venous cases (74% vs 44%) but not in arterial ones (p=0.7).
- **Fakkert 2025** (n=22, prospective): 23% mortality, about one third reaching GOS-5 at 6 months, quality-of-life decline in 53% of survivors.

EVIDENCE BASE

Shape and certainty	No randomised trial exists and none is ethically possible. The best design available is an individual-patient-data meta-analysis of observational studies, supported by cohorts and one 264-case systematic review.

Study	Design	Result and risk of bias
Fakkert 2023, Crit Care — PMID 37434172	SR + IPD meta-analysis, n=263	Positive on timing; observational, low certainty
Beevor 2016, Diving Hyperb Med — PMID 27044457	Retrospective cohort, n=45 (9 untreated)	**Null** vs untreated, OR 0.47 (0.08–2.71); timing predicts
Blanc 2002, Intensive Care Med — PMID 12029402	Retrospective cohort, n=86	Positive; no comparator
Bennett 2012, Cochrane — PMID 22592704	Systematic review	Standard of care; no RCT of recompression exists

WHAT THE EVIDENCE DOES NOT SUPPORT

Cautions	No randomised trial proves efficacy against no treatment. Hatling 2019 is observational only, with publication bias toward centres that report hyperbaric treatment — it establishes a practice pattern, not an effect. Fakkert 2025 has no comparator arm.

STATUS AND SOCIETY POSITIONS

Status	Accepted indication in South Africa (SAUHMA Level C). PMB pathway via the life-threatening shock or hypotension diagnosis-treatment pair.
ICD-10 (SA)	T79.0, T80.0, T81.7, T88.9, O88.0
ECHM 2017 (Type, Level)	1C; 1B with neurological or cardiac 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.