

Avascular Necrosis of the Femoral Head

ELECTIVE — but staged by collapse, not by time from onset

An adjunct in early, pre-collapse femoral-head osteonecrosis, aiming to preserve the joint and delay or avoid arthroplasty.

TREATMENT PROTOCOL	
Pressure	2.0–2.5 ATA (2.5 ATA in the anchor trial)
Duration	60–70 min at pressure; up to 90 min in some series, with an optional 10-min air break
Frequency	Once daily
Sessions	Ficat I: 30–40, then MRI and orthopaedic review at 1 month. Ficat II: 30–40, a pause of 20–30 days, then a further 20. Ficat IIIA and beyond: repeatable once or twice at 4–6 months
Review	After 40 treatments, with a new MRI at least a month later

PATIENT SELECTION	
Who to treat	Early-stage aseptic osteonecrosis, most evidence in the femoral head, at Ficat I–II or Steinberg I–II — that is, pre-collapse. Earlier stages respond best.
Who not to treat, or when to stop	Limited value after subchondral collapse (Ficat III and beyond) — benefit is stage-dependent and falls away once the joint surface has collapsed; the manual says definitive surgery for collapsing cortical bone should not be postponed.
Mechanism	Raises oxygen tension in the ischaemic femoral head; reduces marrow oedema and intraosseous pressure, interrupting the compartment-like ischaemia-oedema cycle; supports angiogenesis and osteogenesis.
Outcome measure	Pain and range of motion; arthroplasty rate; radiographic healing and MRI normalisation; Harris Hip Score.

WHAT THE NUMBERS SHOW	
- Camporesi 2010 RCT (n=20, double-blind, hyperbaric-air control, Ficat II): significant pain and range-of-motion improvement at 6 weeks; at 7 years (uncontrolled after crossover) all substantially pain-free, no arthroplasty, radiographic healing in 7 of 9 hips. - Paderno 2021 (10 studies, 721 patients): clinical benefit OR 3.84 (95% CI 2.10–7.02, P<0.00001). - Niu 2026 network meta-analysis (29 studies, 2,177 hips): HBO regimens ranked first for pain, but no intervention reduced conversion to hip replacement; every outcome low or very low certainty. - Cao 2025 (10 studies, 568 patients): improved events RR 1.83 (95% CI 0.37–9.09, P=0.46) — no significant difference against control. - Reis 2003 (16 hips, Steinberg I): MRI normalisation 81% treated against 17% in another centre's published untreated patients.	

EVIDENCE BASE		
Shape and certainty	Anchored by one small double-blind randomised trial (n=20, single centre). Multiple meta-analyses exist, but the positive ones are heterogeneous, predominantly Asian, and one (Paderno) shares authorship with the anchor trial; the meta-analysis isolating the controlled comparison is null, and a 2026 network meta-analysis found no intervention reduced hip replacement. UHMS accepts this at grade 2B; ECHM at Type 2 / Level B. The wiki holds the page as guarded.	
Study	Design	Result and risk of bias
Camporesi 2010, J Arthroplasty — PMID 20637561	Double-blind RCT, n=20	Positive in Ficat II; RoB 2 some concerns
Paderno 2021 — PMID 33808951	Meta-analysis, 10 studies	Positive, OR 3.84
Niu 2026, Front Cell Dev Biol — PMID 42529114	Network meta-analysis, 29 studies	Mixed — pain favours HBO; no effect on hip replacement
Cao 2025, EFORT Open Rev — PMID 40591670	Meta-analysis, 10 studies	Null against control, RR 1.83 (0.37–9.09)
Reis 2003, JBJS Br — PMID 12729112	Historical-control cohort, 16 hips	Positive; ROBINS-I critical

WHAT THE EVIDENCE DOES NOT SUPPORT	
Cautions	No benefit after subchondral collapse. The meta-analysis isolating the controlled comparison found no significant difference against control despite real before-and-after gains — patients improve, but not measurably more than those who were not treated. The UHMS chapter and the positive trials share authorship, which the wiki flags as an independence caveat. A combination trial adding shockwave and alendronate showed no arthroplasty advantage and cannot isolate a hyperbaric effect.

STATUS IN SOUTH AFRICA	
Status	Not a PMB condition — M87.05 is not on the CMS coded list. Relies on the clinical and SAUHMA argument plus NRPL recognition, supported by UHMS 2B and ECHM Type 2 / Level B.

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 03 October 2026. Not a SAUHMA publication and carries no society endorsement.