

Compromised Grafts and Flaps

START AS SOON AS COMPROMISE IS SUSPECTED — salvage falls away by 24 h

A salvage adjunct for compromised but not yet necrotic grafts and flaps, raising oxygen tension in the marginally perfused bed.

TREATMENT PROTOCOL	
Pressure	2.0–2.5 ATA
Duration	90–120 min, depending on facility and patient
Frequency	Twice daily on initiation, stepping down to once daily once the area proves viable and stable
Sessions	No fixed count — driven by tissue response; TcPO2 below 40 mmHg warrants continued therapy (Francis 2017)
Review	After 20 treatments, at two separate points: preparing the recipient site, and again after the graft or flap is placed
PATIENT SELECTION	

Who to treat	Grafts and flaps that are compromised but not yet necrotic — failing perfusion, venous congestion, arterial insufficiency, reperfusion injury, or an irradiated or hypoxic bed at high risk of failure.
Who not to treat, or when to stop	Not for healthy, well-perfused grafts and flaps. Not indicated in any routine skin grafting (Francis 2017). A 10-patient randomised study of routine use in uncomplicated free-flap transfer found no difference, but analysed only 8. Surgically correctable causes — venous congestion, anastomotic compromise — must be fixed first or alongside.
Mechanism	Raises oxygen tension in the marginally perfused bed; enhances fibroblast function and collagen synthesis; stimulates angiogenesis; mitigates reperfusion injury through nitric-oxide and VEGF-mediated suppression of neutrophil adhesion.
Outcome measure	Complete graft take and graft-area survival; flap necrosis; healing time. Transcutaneous oximetry predicts failure below about 50 mmHg at pressure.

WHAT THE NUMBERS SHOW	
<ul style="list-style-type: none">Perrins 1967 RCT (n=48, <i>unselected</i> split-skin grafts, not threatened tissue): complete take 64% vs 17%, NNT about 2; mean graft-area survival by intention to treat 84.2% vs 62.7%, difference 21.5% (t=2.92, P<0.01). <i>The widely quoted 29% figure is per-protocol, not the intention-to-treat result.</i>Waterhouse 1993 (free flaps): 89% salvage when started within 24 h; total loss when started after 3 days.Bowersox 1986 (n=105): failure was tied to delay beyond two weeks — 19.8 against 4.6 days post-operatively.Roje 2008 (n=388, war injuries): skin-graft lysis 23% vs 52%; flap necrosis 15% vs 51%, both P<0.001.Uniyal 2025 RCT (n=64): graft uptake at day 7 91.7% vs 83.1%, P=0.026.	

EVIDENCE BASE	
Shape and certainty	About 24 records. UHMS grades this class IB — one randomised trial plus non-randomised studies. An independent GRADE review rates graft-take evidence low to moderate. Cochrane 2013 found four trials too heterogeneous to pool — a lack of high-quality evidence, Perrins included.

Study	Design	Result and risk of bias
Perrins 1967, Lancet — PMID 4164367	RCT, n=48	Positive ; RoB 2 high
Uniyal 2025 — PMID 40215364	RCT, n=64	Positive
Vishwanath 2011, MJAFI — PMID 27365816	RCT, n=10, routine use	Null ; 8 analysed, underpowered
Carter 2026 — PMID 42199243	SR / meta, 24 studies, 2,246 patients	Positive; UHMS-linked authorship declared
Eskes 2013, Cochrane — PMID 24343585	SR, 4 trials	Lack of high-quality evidence

WHAT THE EVIDENCE DOES NOT SUPPORT	
Cautions	Routine or prophylactic use on uncomplicated flaps is not supported. A case-control study of perioperative treatment for breast reconstruction after radiotherapy (15 per arm) found no difference in complications; the treated group started with worse baseline radiation damage (3.55 vs 2.89, P=0.001) — confounding, not harm. A 2026 flap-survival odds ratio of 8.57 is directional only, resting predominantly on Chinese-database trials. A 2026 plastic-surgery meta-analysis (18 studies) pooled complications at OR 0.48 (95% CI 0.09–2.66, P=0.40) — null , although its abstract calls it a 52% reduction.

STATUS AND SOCIETY POSITIONS	
Status	Accepted indication in South Africa (NRPL-recognised); no dedicated SAUHMA protocol. No direct PMB code — argued via the underlying condition requiring the graft or flap.
ICD-10 (SA)	T86.8, T87.0, T87.1
SAUHMA 2023	No protocol (NRPL-recognised; UHMS parameters used)
ECHM 2017 (Type, Level)	2C; 1B as soon as compromise is diagnosed

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.