SAMPLE TREATMENT PROFILES

(Assembled by: Rasa Silenas, MD)

EMERGENT INDICATIONS

I. Air/Gas Embolism

A. What theory suggests

1. Therapeutic goals

a) Bubble compression

b) Reduce edema

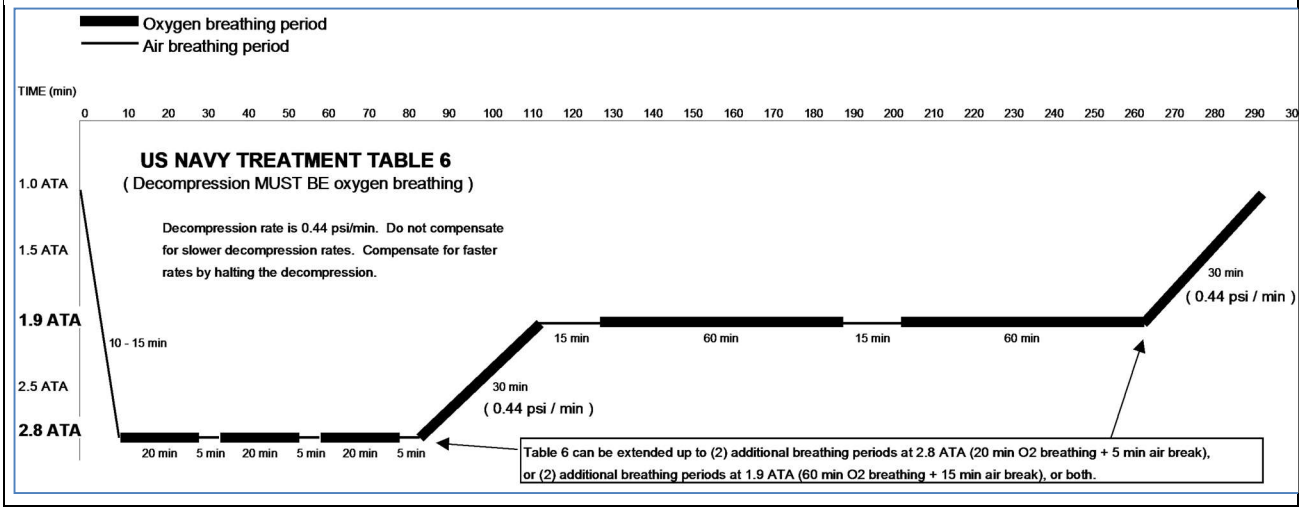
c) Normalize cytokines

2. How we would do that

a) Treat fast, long, often and deep

AIR/GAS EMBOLISM

ATA	URGENCY	TREATMENT LENGTH	AIR BREAKS	TREATMENT FREQUENCY	# OF TREATMENTS	COMMENT
2.8 USN Table 6	Emergent	5 hr	Yes	Up to 3 in 1st 24 hr, then daily	Up to 14 days	Monoplace operators—read up!



Notes

II. CO & CN Poisoning

A. What theory suggests

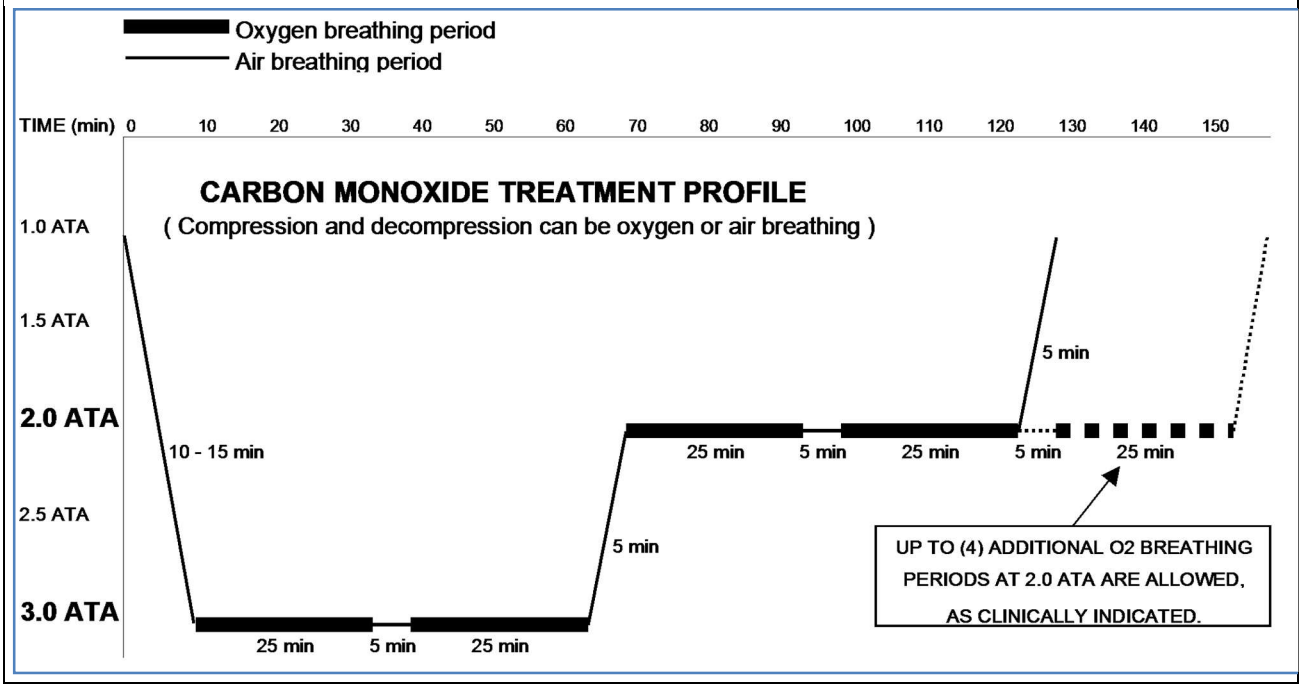
1. Outcompete CO-Hgb or CN/cytochrome oxidase bonds
2. Deliver O2 to tissues via plasma

B. How we would do that

1. Treat fast and deep

CO & CN Poisoning

ATA	URGENCY	TREATMENT LENGTH	AIR BREAKS	TREATMENT FREQUENCY	# OF TREATMENTS	COMMENT
2.5-3.0 USN Table 5, 9	Emergent	2.5 hr	Yes	2-3 1st 24 hr	To resolution of symptoms, usually 1-2	Treat symptoms, not blood level



Notes

III. Clostridial Myonecrosis

A. What theory suggests

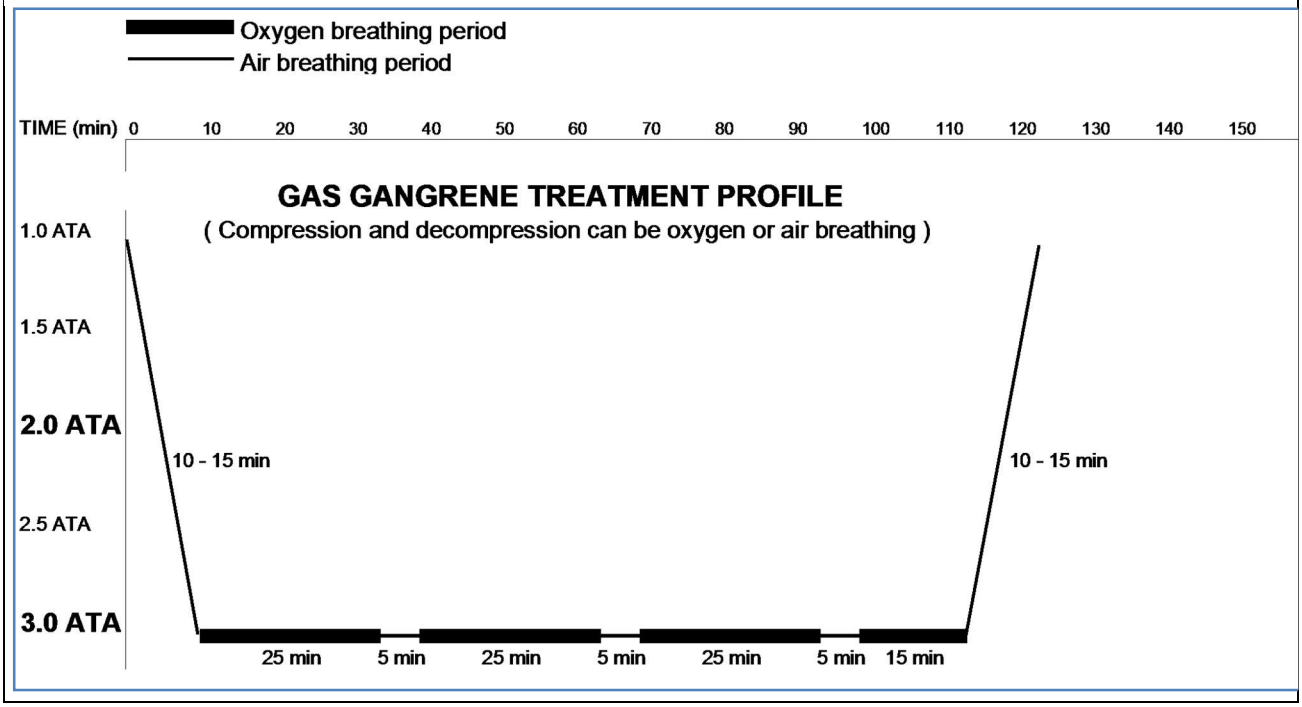
1. High O2 dose to stop toxin production (TCPO2 > 250mmHg)
2. Potentiate antibiotics
3. Enhance leukocyte function
4. Reduce edema

B. How we would do that

1. Treat fast, often and deep
2. Consider in-chamber TCPO2 to verify >250mmHg

CLOSTRIDIAL MYONECROSIS

ATA	URGENCY	TREATMENT LENGTH	AIR BREAKS	TREATMENT FREQUENCY	# OF TREATMENTS	COMMENT
3.0 USN Table 5	Emergent	2 hr	Yes	2-3 per 24 hr	Minimum 3-5, till clearly stopped	HBO used with surgery and antibiotics.



Notes

IV. Acute Traumatic Ischemia, Crush Injury & Reperfusion Syndrome

A. What theory suggests

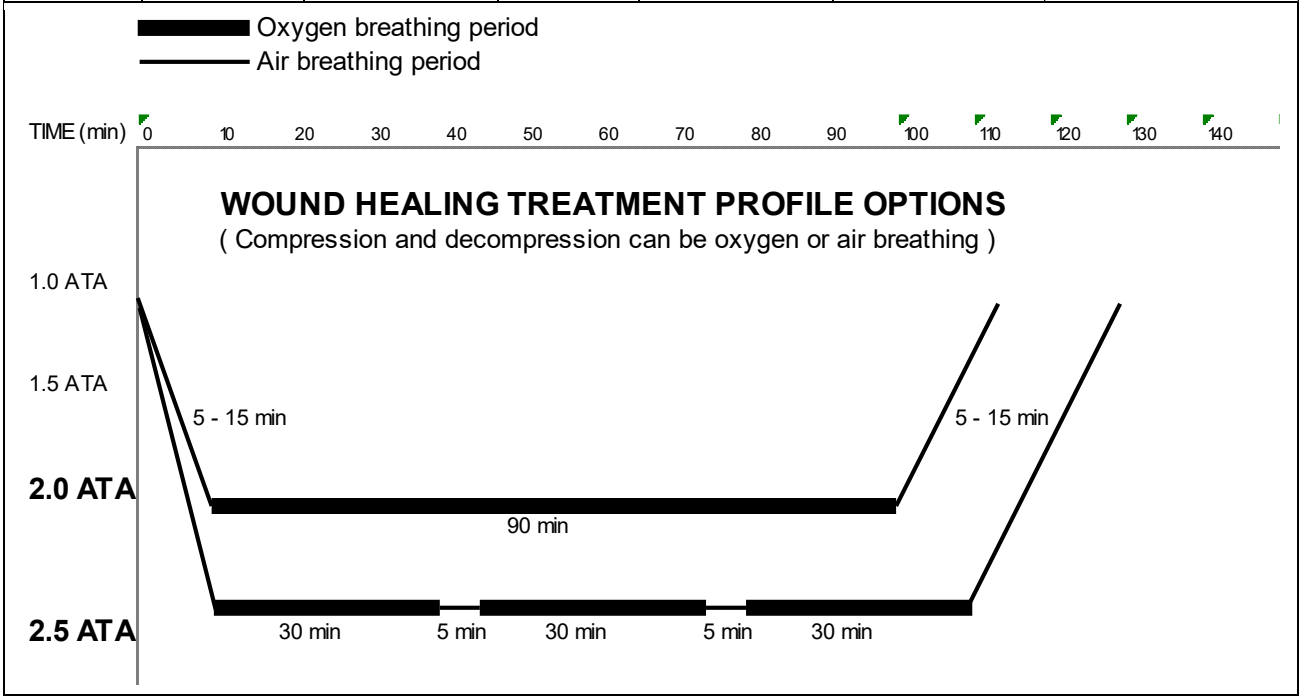
1. Correct hypoxia
2. Reduce edema
3. Normalize cytokines
4. Normalize leukocyte function
5. Make scavengers of reactive oxygen species

B. How we would do that

1. Treat immediately after surgical reestablishment of perfusion and fasciotomy
2. Experience suggests 2.0 ATA usually sufficient

ACUTE TRAUMATIC ISCHEMIA, CRUSH INJURY & REPERFUSION SYNDROME

ATA	URGENCY	TREATMENT LENGTH	AIR BREAKS	TREATMENT FREQUENCY	# OF TREATMENTS	COMMENT
2.0-2.5 USN Table 9	Emergent	90-120 min	No	T.i.d. to start, taper by response	To resolution or no further improvement	After surgical reperfusion and fasciotomy



Notes

V. Decompression Syndrome

A. What theory suggests

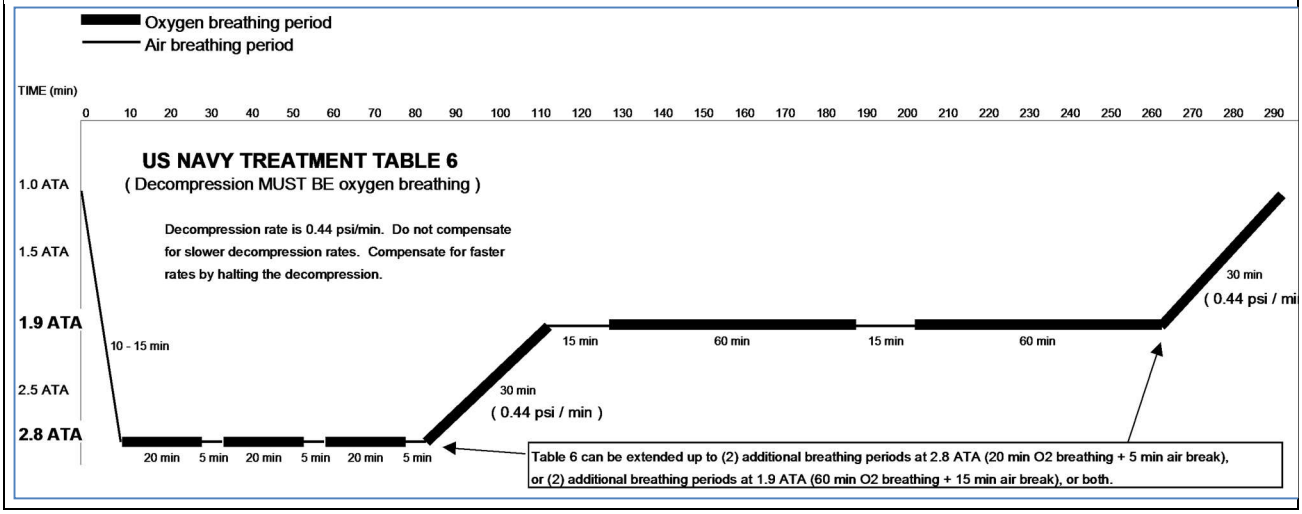
1. Compress bubbles
2. Wash out N2
3. Normalize endothelium, cytokines and coagulation pathways
4. Extensive systemic gas may be present with minor symptoms

B. How we would do that

1. Treat early (but delayed treatments can still be beneficial)
2. Treat as deep and long as possible

DECOMPRESSION SICKNESS

ATA	URGENCY	TREATMENT LENGTH	AIR BREAKS	TREATMENT FREQUENCY	# OF TREATMENTS	COMMENT
2.8 USN Table 5, 6	Emergent	5-8 hrs	Yes	As indicated by symptoms	To resolution of symptoms, usually 1-2	Longer or deeper tx for severe symptoms



Notes

VI. Central Retinal Artery Occlusion

A. What theory suggests

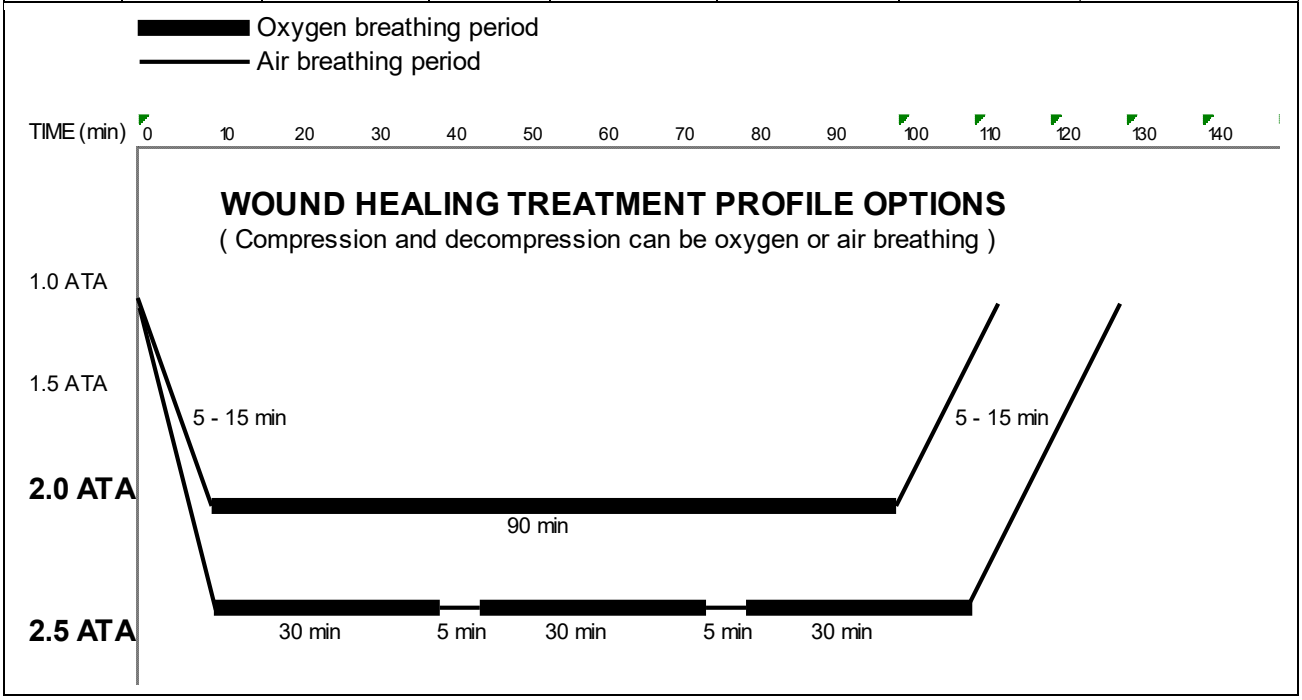
1. Edema reduction
2. Normalization of cytokines

B. How we would do that

1. Treat early and frequently
2. Depth ?? Usually use wound healing profile

CENTRAL RETINAL ARTERY OCCLUSION

ATA	URGENCY	TREATMENT LENGTH	AIR BREAKS	TREATMENT FREQUENCY	RATIONAL	# OF TREATMENTS	COMMENT
2.0-2.8	Emergent	90-120 min	No	2-3/d to start, then daily	To resolution or no further improvement	Bubble compression Reduce edema Normalize cytokines	May help up to a week after onset



Notes

VII. Severe Anemia

A. What theory suggests

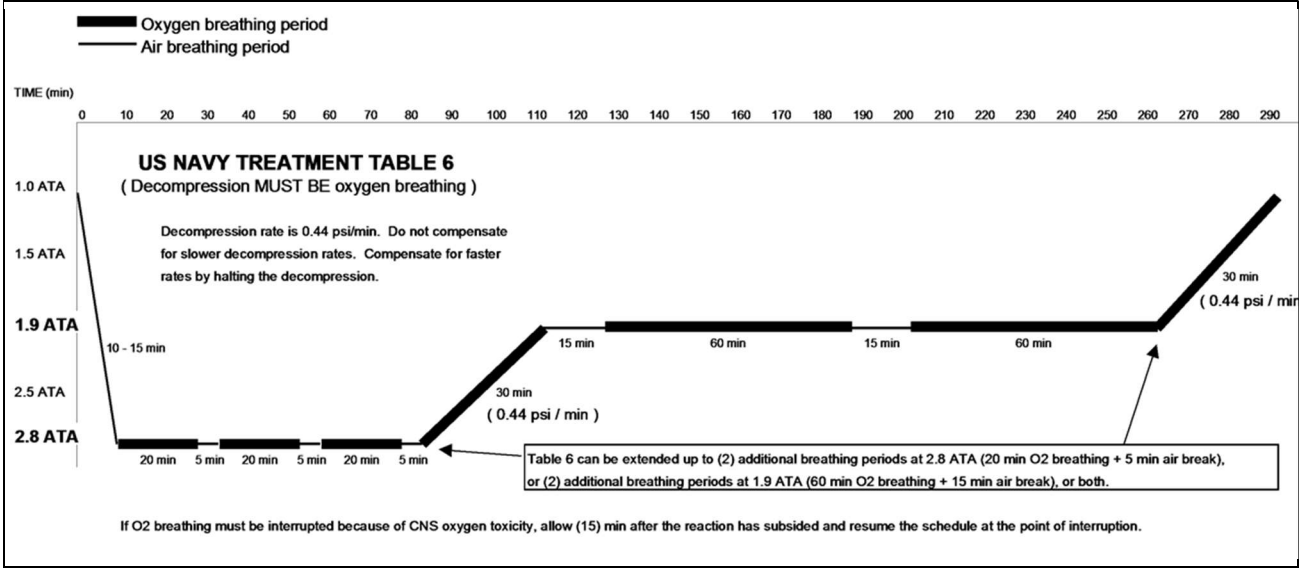
1. Delivery of dissolved O2 to supplement inadequate hemoglobin level

B. How we would do that

1. Treat fast, deep and long
2. Repeat according to symptoms, vital signs and EKG changes

SEVERE ANEMIA

ATA	URGENCY	TREATMENT LENGTH	AIR BREAKS	TREATMENT FREQUENCY	# OF TREATMENTS	COMMENT
Begin at 3.0	Emergent	2 hr	Yes	Begin t.i.d. Surface intervals as tolerated	Till stabilized or corrected	Replace blood or give IV iron and erythropoietin Monitor TCPO2, SvO2 and TCPO2 Consider hypothermia Evidence level IIb (acceptable and useful)



Notes

URGENT INDICATIONS

VIII. Intracranial Abscess

A. What theory suggests

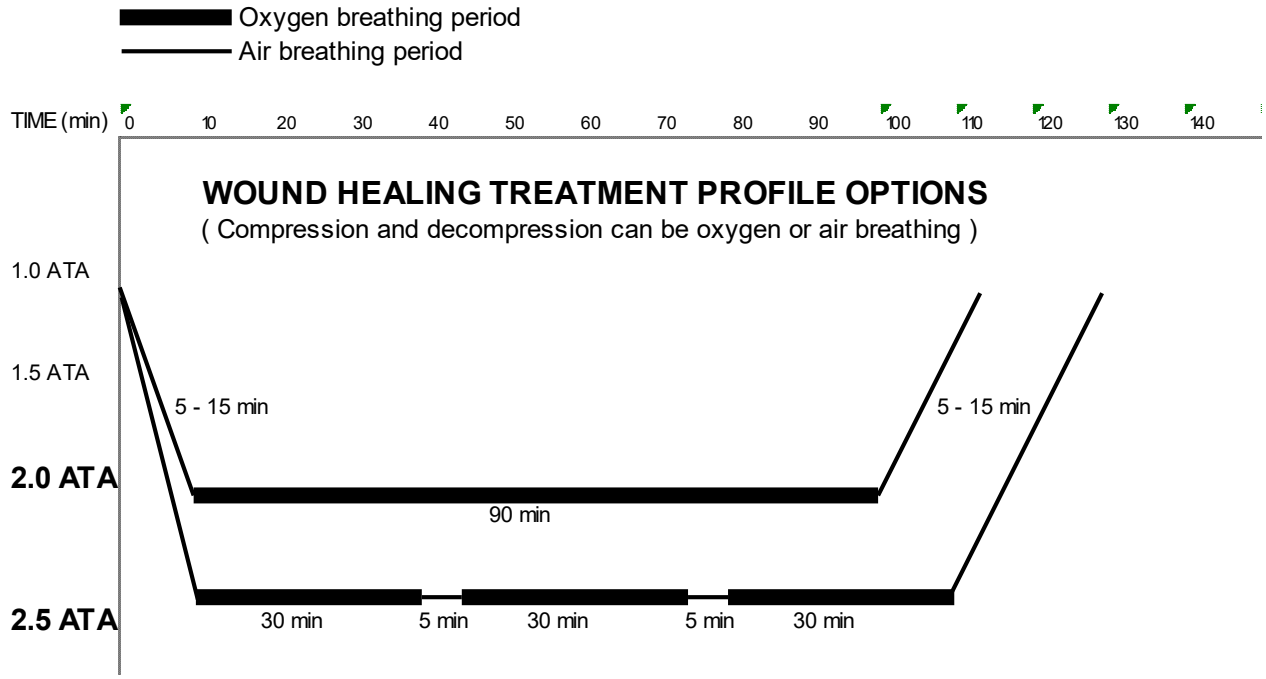
1. Inhibits anaerobes
2. Reduces edema
3. Enhances host defenses
4. Treats skull osteomyelitis

B. How we would do that

1. High tissue O2 levels over long time

INTRACRANIAL ABSCESS

ATA	URGENCY	TREATMENT LENGTH	AIR BREAKS	TREATMENT FREQUENCY	# OF TREATMENTS	COMMENT
2.0-2.5 USN Table 9	Urgent	60-90 min	No	2-3 per day	Titrate to response, avg 13 tx reported	Used with surgery and antibiotics



Notes

IX. Necrotizing Soft Tissue Infections

A. What theory suggests

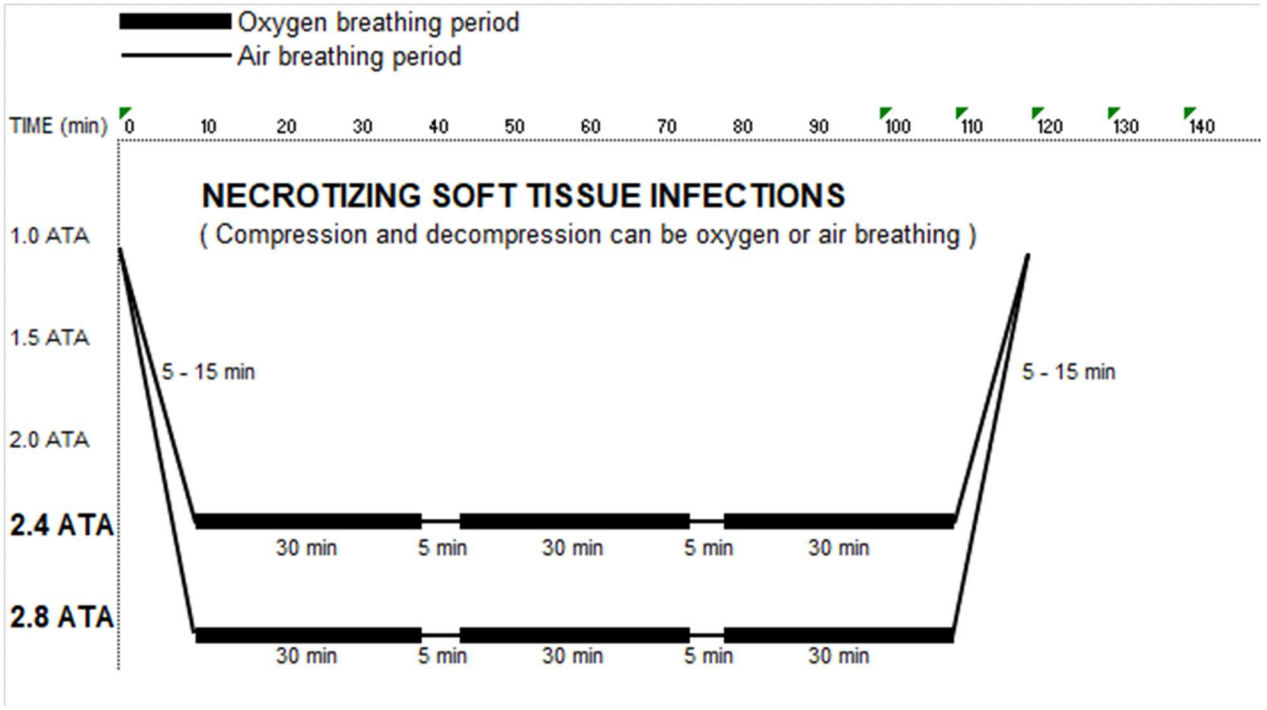
1. Suppress flora
2. Enhance antibiotic penetration
3. Reduce edema
4. Enhance leukocyte function

B. How we would do that

1. Probably by high O2 tension rather than gas physics
2. Wound healing protocol, consider in-chamber TCPO2

NECROTIZING SOFT TISSUE INFECTIONS

ATA	URGENCY	TREATMENT LENGTH	AIR BREAKS	TREATMENT FREQUENCY	# OF TREATMENTS	COMMENT
2.4-2.8 USN Table 9	Urgent	90 min	+/-	3 per 1st 24 hr, 2 per day till stabilized	Titrate to response	Used with surgery and antibiotics



Notes

X. Compromised Flaps & Grafts

A. What theory suggests

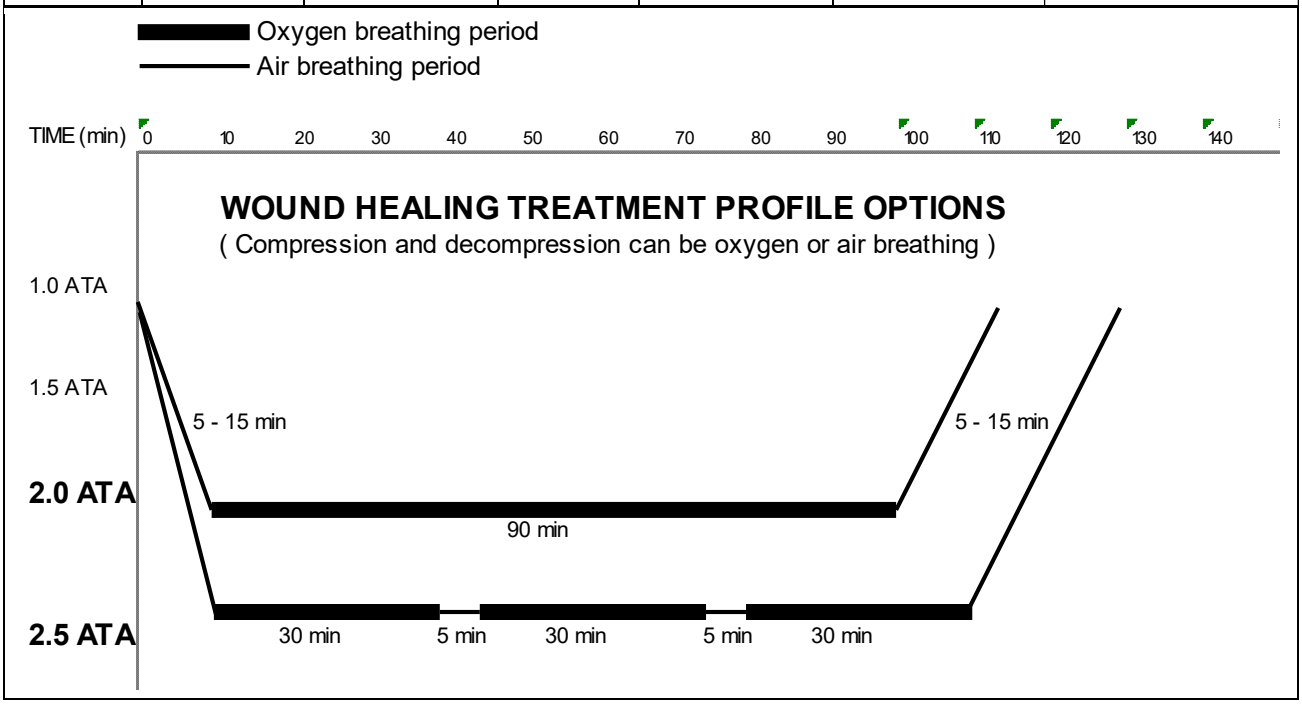
1. Delivery of dissolved O2
2. Reduced edema
3. Normalization of cytokines
4. Enhanced angiogenesis

B. How we would do that

1. Treat early and often
2. 2.0-2.5 ATA typical

COMPROMIZED FLAPS AND GRAFTS

ATA	URGENCY	TREATMENT LENGTH	AIR BREAKS	TREATMENT FREQUENCY	# OF TREATMENTS	COMMENT
2.0-2.5 USN Table 9	Urgent	90-120 min	No	2-3 1st 24 hr then daily or more	Till resolved or no more improvement	Correct blood flow issues first



Notes

XI. Acute Thermal Burns

A. What theory suggests

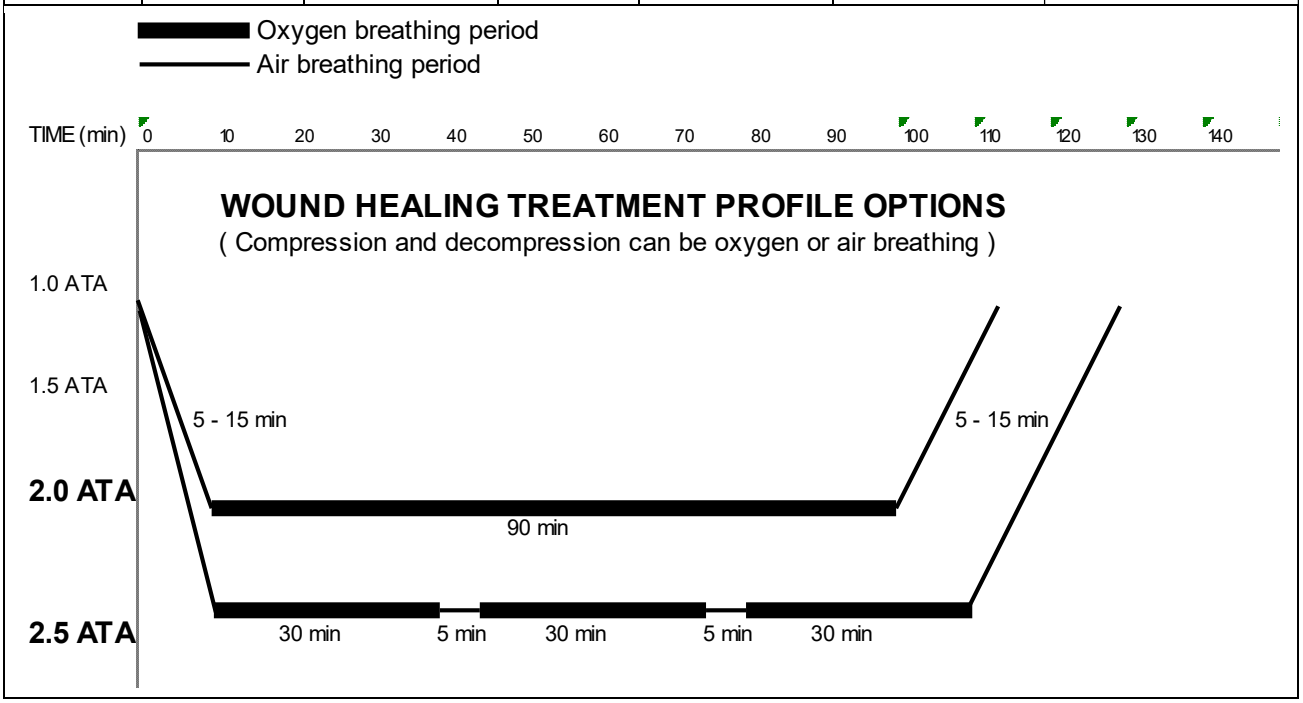
1. Treat CO intoxication
2. Treat inhalation injuries
3. Reduce edema
4. Normalize cytokines and coagulation factors
5. Enhance wbc function

B. How we would do that

1. CO protocol if indicated
2. Otherwise wound healing protocol

ACUTE THERMAL BURNS

ATA	URGENCY	TREATMENT LENGTH	AIR BREAKS	TREATMENT FREQUENCY	# OF TREATMENTS	COMMENT
2.0-2.5 USN Table 9	Urgent	90 min	+/-	T.i.d.-B.i.d.	Till stabilized or no more improvement	Critical care necessary Hi risk ear barotrauma May benefit indeterminate-thickness burns of hands and face Insufficient evidence to support CMS reimbursement



Notes

XII. Acute Sensorineural Hearing Loss

A. What theory suggests

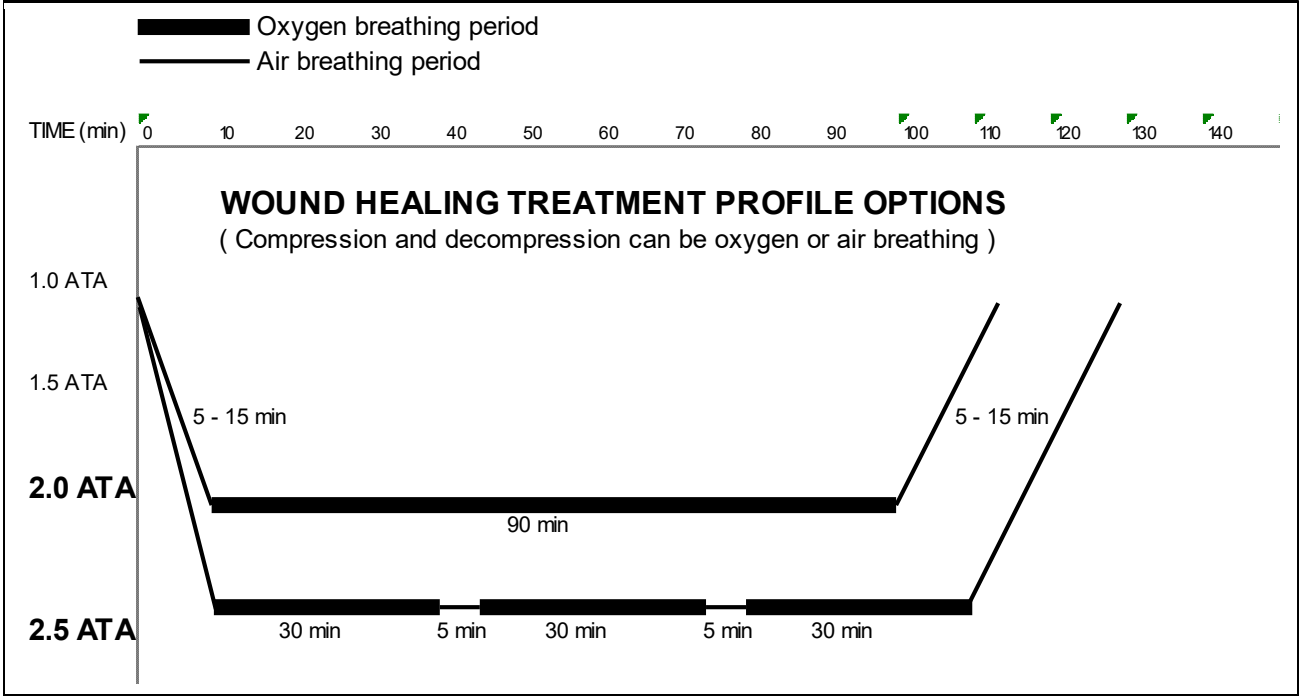
1. Enhanced O2 delivery to hypoxic cochlea

B. How we would do that

1. Probably wound healing protocol

ACUTE SENSORINEURAL HEARING LOSS

ATA	URGENCY	TREATMENT LENGTH	AIR BREAKS	TREATMENT FREQUENCY	# OF TREATMENTS	COMMENT
2.0-2.5 USN Table 9	Urgent	90 min	No	Daily	Titrate to response or no more change, ~10-15 tx	May benefit up to 2 wk after onset



Notes

ELECTIVE INDICATIONS

XIII. Problem Wounds

A. What theory suggests

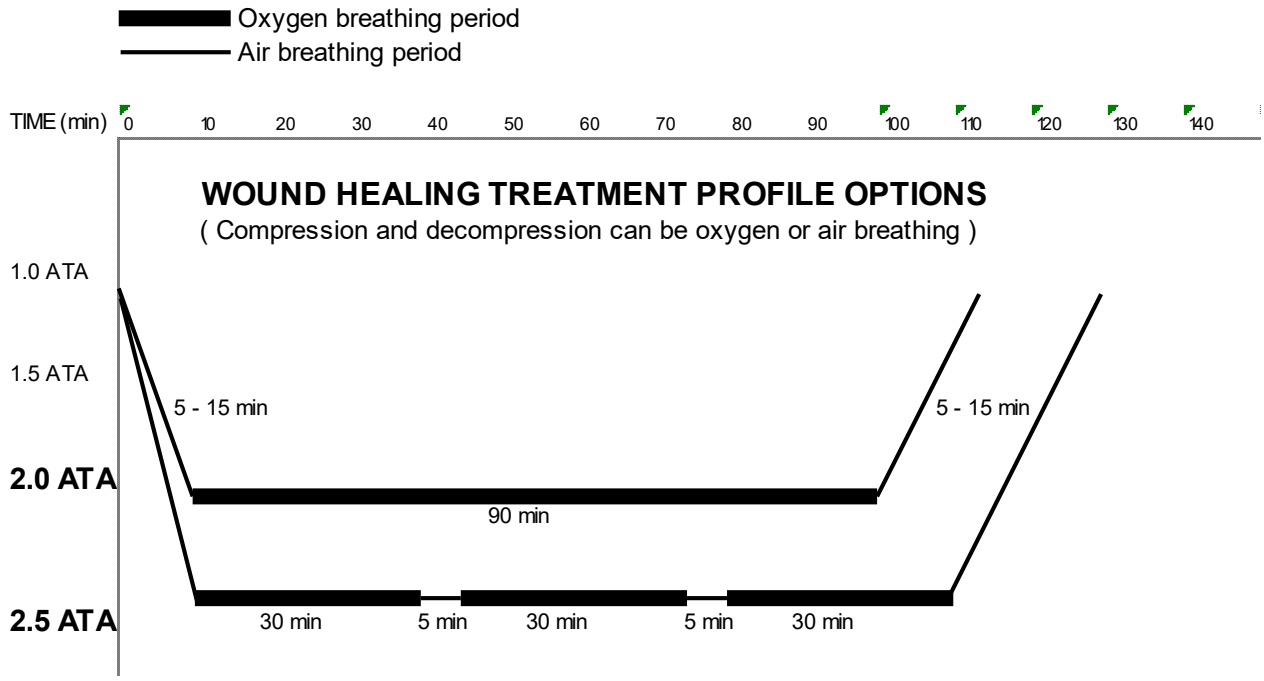
1. Enhance angiogenesis
2. Normalize cytokines
3. Normalize leukocyte function
4. Suppress flora

B. How we would do that

1. Treat to adequate TCPO2
2. Elective schedule
3. Clinical monitoring

PROBLEM WOUNDS

ATA	URGENCY	TREATMENT LENGTH	AIR BREAKS	TREATMENT FREQUENCY	# OF TREATMENTS	COMMENT
2.0-2.5 USN Table 9	Elective	90 min	No	5 days per week	10-12, then reassess	Depth guideline may be replaced by treating to specific TCPO2. Termination guidelines evolving.



Notes

XIV. Chronic Osteomyelitis

A. What theory suggests

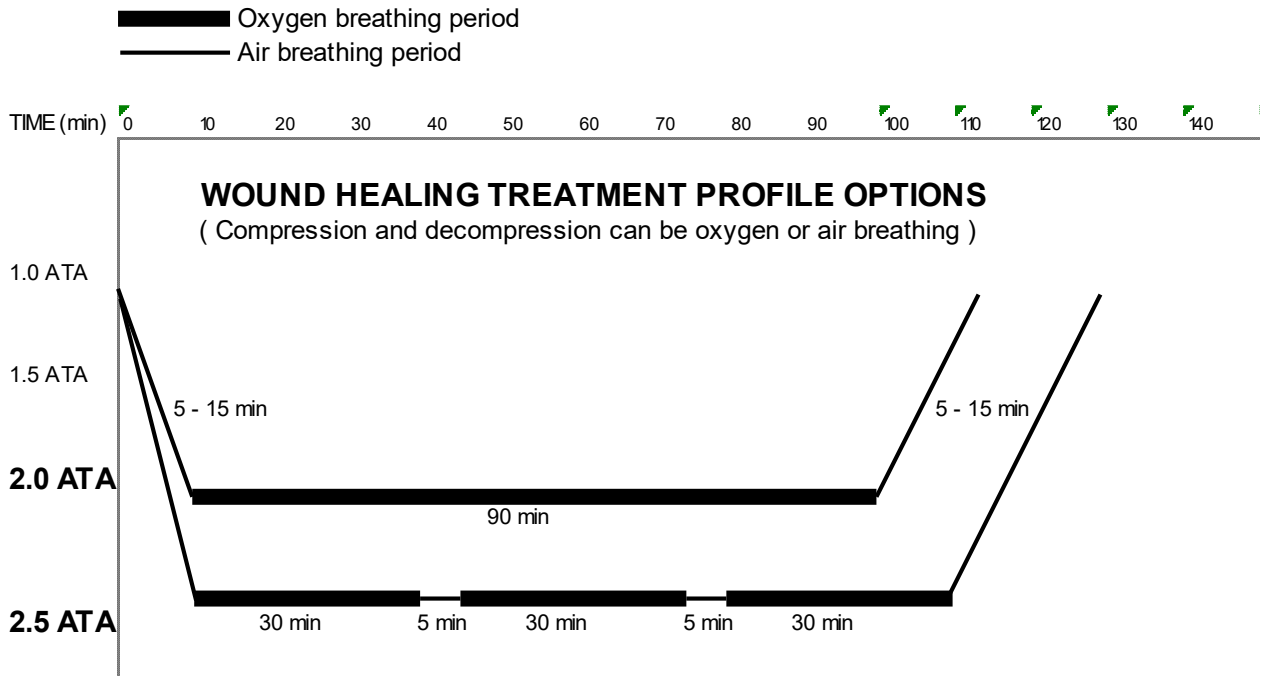
1. Suppress flora
2. Enhance antibiotic penetration
3. Enhance leukocyte function
4. Enhance osteogenesis
5. Enhance angiogenesis

B. How we would do that

1. High O2 levels over time

CHRONIC OSTEOMEYELITIS

ATA	URGENCY	TREATMENT LENGTH	AIR BREAKS	TREATMENT FREQUENCY	# OF TREATMENTS	COMMENT
2.0-2.5 USN Table 9	Elective	90-120 min	No	Daily 5x per week	20-30, peer review after 60	Used with antibiotics and surgical debridement No longer covered for toes



Notes

XV. Radiation Bone or Soft Tissue Injury

A. What theory suggests

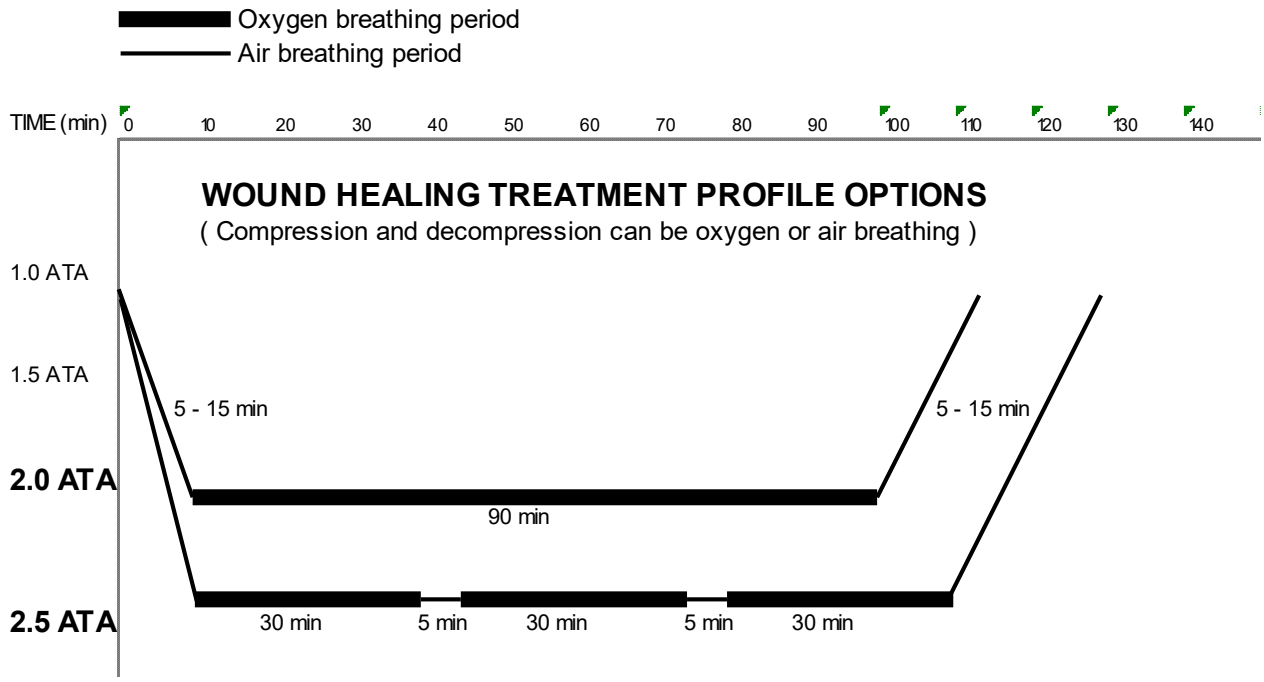
1. Enhance angiogenesis
2. Enhance leukocycte function
3. Reduce fibrosis
4. Mobilize stem cells (maybe)

B. How we would do that

1. High O2 levels over time

RADIATION BONE OR SOFT TISSUE INJURY

ATA	URGENCY	TREATMENT LENGTH	AIR BREAKS	TREATMENT FREQUENCY	RATIONAL	# OF TREATMENTS	COMMENT
2.0-2.5 USN Table 9	Elective	90-120 min	No	20-40 preop + 10 postop	Titrate to response or no more change; may take up to 60	Enhance angiogenesis Enhance leukocycte function Reduce fibrosis Mobilize stem cells (maybe)	May need surgical resection of dead bone or flap wound closure



Notes