SECTION 2

MEDICAL AND PHYSIOLOGY TABLES

SAFE PRACTICES AND PROCEDURES

DRUGS

A list of the drugs you might come across and their uses:

ENTENOX	- *Pain killing gas held in ambulance NOT to be given to bend cases.*
LIDOCAINE	- *Local anaesthetic*
MEDROL	- *Anti inflammatory*
VALIUM	- *Muscle and nerve relaxant, anti inflammatory, helps prevent oxy stimulating effect.*
PIFRACEL PIFREX 100	- *reinforces arteries and veins*
DEXTROSE	- *Intravenous (usually) nutrient replacer*
PHENOBARBITAL	- *Sedation, Hypnotic*
CORTICOSTEROID	- *For thinning blood, anti inflammatory*
PERVINCAMINE	- *Increases receptivity to oxy*
ASPEGIC	- *Soluble aspirin*
SOLUDECADRON)	- *Corticoid suppressing cerebral and*
DECADRON)	*spinal oedema abnormal fluid*
SYNACTHEN)	*accumulation*
DEXAMETHASONE	- *Anti inflammatory with little salt retaining action*
ASPIRIN	- *Pain and anti coagulant.*
RHEOMACRODEX	- *Plasma with anti sludge agent*
BUFFERIN	- *Soluble aspirin*
CARISOM CO.	- *Muscle relaxant*
VALIOD	- *Sea sickness*
DRAMAMINE	- *Sea sickness*
AMOBARDITAC SODIUM	- *Hypnotic sodium compound*
PIRITON	- *Allergy, rashes and bites*
NITRAZEPAM	- *Sleeping tablets*
MIS-KAOLINMORPH	- *Diarrhoea*
MERBBENTYL and SPASMONCARBINE	- *Abdominal pains*
CHLOROMYCETIN	- *Eye drops*
EPHEDRINE	- *Minor ear drops*
SOFRATULLE	- *Extensive burns*
GRAMICIDEN	- *PYO, ear drops*
RINGERS SOLUTION	- *Injectable sodium chloride - salt*
PEPTO BISMOL	- *Upset stomach*
MITICAL OINTMENT	- *Itching, ringworm, scabies*
VEGANIN TABLETS	- *Headache*
ORNEX	- *Colds, flu, headache*

POLOYENE COMPOUND	- *Rheumatism pain - very strong*
ERYTHROCIN	- *Antibiotic*
BRUFIN TABLETS	- *Rheumatism pain*
ROBAXIN	- *Muscle relaxant*
SOFRAMYCIN	- *Eye ointment*
TERRA COTRIL	- *Eye and ear infection*
TINIDERM	- *Anti fungal*
BENADRYL	- *Anti histamine*
XYLOCAINE OINTMENT	- *Anaesthetic*
SELSUN BLUE	- *Dandruff - white spots on skin*
CELESTONE STEROID	- *Anti allergy*
STEMETIL TABLETS	- *Anti vomitting*
ACTIFED	- *Colds - sinus*
PARACETAMOL (PANADOL)	- *Pain killer*
FONZYLANE	- *Dilates blood vessels*
TORENTAL	- *Helps blood circulation*
HAEMACCEL INFUSION	- *Plasma*
AMETHOLANINE	- *Local anaesthetic*
POLYVALENT ANTI-SERUM *containing* KRAIT (ELEPIDAE)	- *Anti venom - sea snake, etc. stone fish*
NIVAQUINE	- ***Anti malaria***
FLAVOQUINE	- ***Anti malaria***
FANSIDAR	- ***Anti malaria***
ISOPRENALINE	- *Bronchial asthma*
ALEUDRIN	
FONZYLANE	- *Facilitates blood circulation, dilates*
TORENTAL	*blood vessels*
DEXTRAN 70	- *Increases circulation, anti-sludge effect, displaces extra cellular fluid. boosts microcirculation.*
HEPARIN	- *Stops red cell stickiness*
DIURETICS	- *Causes excretion of fluid as urine*
OPILON	- *Vaso-active, improves inner ear circulation*
ALUMINUM ACETATE	- *Prevention ear drops*
POLYMIXIN GENTIMICIN	- *Treatment ear drops*
OTIC DOMEBORO	- *Prevention ear drops*

DIVING AND MEDICAL TERMINOLOGY

ALVEOLI - *thin walled sacs in the lung where exchange breathing gas and gas dissolved in blood occurs.*

CEREBRAL EMBOLISM - *bubble of gas in the blood stream reaching the brain and interfering with the central nervous system.*

CYANOSIS - *blue colour of the skin resulting from lack of oxy*

HEMIPLEGIA - *paralysis of one side of the body.*

PARAPLEGIA - *paralysis of usually the lower half of the body.*

QUADRAPLEGIA - *paralysis of all four limbs*

NEUROLOGICAL - *to do with the nervous system*

PLEURAL CAVITIES - *spaces within each side of the chest totally occupied by each lung.*

HYPERCAPNIA - *CO^2 poisoning*

PLATELETS - *particles in the blood much smaller than corpuscles which clump together and stick to site of injury, also caused to clump by bubbles of gas.*

HYPERCOAGULABILITY - *lipid, platelet envelope around gas bubbles.*

HAEMOCONCENTRATION - *loss of fluid from circuitry into tissue.*

MEDIASTINUM EMPHYSEMA - *gas escaping from lung to thorax.*

HYPERBARIC ATHRALGIA - *diver feels his joints are dry and hears them cracking.*

H.P.N.S. HIGH PRESSURE NERVOUS SYNDROME - *convulsions and general nervous disorder caused by rapid compression.*

EAR & SINUS BARATRAUMA - *a squeeze of over pressure of the inner ear and sinuses.*

NITROGEN NARCOSIS - *toxic effect of nitrogen*

HYPOTHERMIA - *excessive cold*

HYPERTHERMIA - *excessive heat*

ANOXIA - *lake of oxy*

HYPOXIA - *no oxygen*

HYPEROXIA - *Oxygen poisoning*

PULMONARY BARATRAUMA - *damage to the lung*

EMBOLISM - *over pressurization of the lung*

PNEUMOTHORAX - *lung collapse. A tearing of the lung membrances*

DYSPNEA - *a feeling of breathlessness.*

BASIC PRINCIPLES OF FIRST AID

Safely recover diver
Clear airways
Restore breathing
Stop massive bleeding
Assure heart functions.

EMERGENCY CHARTS

HANDLING AN UNCONSCIOUS DIVER AT SURFACE

Recover diver
Remove helmet and clear airway
Organize transport
|
Transport to DDC
|
During transport if necessary apply C.P.R.
Transport & ventilate - 15 sec
Cardiac massage - 10 sec
|
Place in DDC with diver/medic treat as a blow up

ASSISTANCE TO DIVER IN WATER

Upon reaching an unconscious diver underwater -

Open Free Flow
|
Is gas flowing out of mask?
|
No ——— Yes
| |
Close free flow — Crack a small flow
| |
Open bailout |
| |
Bring back safely
|
Surface ——— Bell
| |
Direct the surface assisted ascend — Secure diver in bell, do not blow out bellwater
| |
Ensure diver is not holding his breath. Squeeze lungs. — Apply CPR if necessary
| |
Follow handling an unconscious diver on surface. — Liase with supervisor

NOTE:

With an unconscious diver in a bell, you must leave water in bell, as this supports his lower blood circulation, allowing maximum blood flow to the brain.

CPR must be performed like this - you must know how to do this. Only when diver is breathing, in a semi stupor, awake, or dead do you blow water out of bell. If you wish to feel the effect, when doing a recovery exercise, whilst hanging have bellman blow out water.

BELLMANS RESPONSIBILITIES AND DUTIES

It is the Bellmans duty to be prepared, therefore, before the diver puts on the hat and exits the bell, the Bellman will:

A) Make sure his umbilical comes off the storage hooks
B) Make sure pulley rope is correct length 1 metre below trunking coil it up ready to drop it out
C) Wear his weightbelt
D) Check his fins
E) Open gas to his hat, and hat is arranged to be donned quickly

If during the dive the diver becomes unconscious, the Bellman will:

A) Switch diver and himself onto onboard gas
B) Try to pull the diver back
C) If he cannot pull him back, drop out the hook
D) Open the bottom flood valve
E) Pull necessary bellman umbilical off storage hooks and place in bell
F) Done mask and fins
G) Exit bell, pull necessary umbilical out, and make his way to the diver along the divers umbilical.
H) Check if the diver has gas: Yes, make sure bailout off, put on slight free flow
No, open bailout and allow gas to hat through reg, <u>DO NOT FREEFLOW</u>

If the diver has lost his hat or mask .....
KMB band mask, put on and secure check he has gas, squeeze lungs a few times and carry on with recovery.

KIRBY 17 SUPERLITE, if cannot immediately get hat on then recover immediately.

J) Pull yourself back along the divers umbilical, and connect him onto snap hook (massdam puller). (<u>Diver must</u> be wearing a harness which supports him around his thighs.)
K) Enter the bell do not remove your mask yet
L) Guide diver into trunking pull, steer. Get back into water yourself if necessary (that is why you keep your mask on) take up the slack on the massdam pulley.

M) Winch him so his head is clear of the water, leave the water level high this will prevent his blood pooling to the legs.
N) Remove his and your hat mask, carry out (ABC) Airway, Breathing, Cardiac.
O) When he has recovered, get him seated and secure him, place ridged collar if not already done so and monitor continuously.
P) Blow out water get a seal after recovering equipment.

SHOCK

Symptoms

Dull eyes, pupils dilated
Could be Cyanosed
Pale and sweating
Rapid weak pulse
Nausea, vomitting, thirst
|
Ensure adequate breathing
|
Control bleeding
|
Lay patient down, raise legs
Keep warm
|
Give oxy
|
If necessary, give intravenous drip.

BLOOD PRESSURE READINGS

Use a Sphygmomanometre kit. Normal blood pressure is 120/80.

Systolic (High) $\frac{100}{}$ + $\frac{AGE}{15}$ = MAX.
Diastolic (Low) $\frac{75}{}$ +

Pump armband. Listen with Stethoscope. The sound of heart starts on the high end Systolic, and stops on the low end Diastolic.

GIVING INTRAMUSCULLAR INJECTIONS

Intramuscular

Buttocks - upper outside quarter
Thigh - upper outside
Arm - upper shoulder muscle

1) Make sure all air is out of syringe and needle.
2) Inject into muscle.
3) Put needle in at 90°
4) Have needle hole uppermost
5) Pull back syringe and make sure you have not hit a vein.

BELL MEDICAL KIT

Torniquet and Pressure Bandages
Mouth Opener - Wooden Screw
Shortened Guedel Airway
Ridgid Collar
Blunt End Scissors
Jack Knife

DDC KIT

As above for Bell kit plus:
Bottle Betadine
Adhesive Bandages
Suture Kit
Gauze Bandages
Sterile Compresses
Sterile Gloves
Cotton Wool
Role Sticking Plaster
Guedel Tube Full One

AND HELD OUTSIDE

Besides a general First Aid Kit.
Suction Pump
Suction Pump Catheters
DDC O^2 Resuscitator
Sphygmomanometre
Stethoscope
Tuning Fork 440 Hz
Reflex Hammer
Thermometer & tongue Depressors
Disposable Cones and a Pencil Torch/Batteries.

There should also be available either in the ship or barge hospital or held by divers the following:

Aluminum Blanket	1
Rubber Torniquet	1
Disposable Syringes 10 ml	2
Disposable Syringes 5 ml	5
Disposable Syringes 2 ml	2
Disposable Needles IV	10
Disposable Needles IM	10
Disposable Needles Trocard	10
IV Catheters	3
Betadine Skin Cleanser	1
Sterile Dressings	40
Adhesive Tape	1

Air Inlet Tubes	1
Gauze Bandage	1
Foley Balloon Catheter No. 18	1
IV Sets	3
Rheomacrodex 500 ml	2 bags
Ringer Lactage Solution 500 ml	2 bags
Thamacetat 250 ml	1 bot.
Soludecradon Injection 4 mg	6 ampoules
Terental Injection 5 ml	8 ampoules
Fonzylane Injection	2 ampoules
Synacthene Immediate	2 ampoules
Tronothane Gel (30 g)	1 tube
Pervincimine Injection	4 ampoules
Valium Inj. 10 mg	2 ampoules
Pleurocentesis Needle	1 ampoule

BENDS

(B) BENDS
MILD BENDS USUALLY PAINS IN JOINTS, AND SURFACE SKIN BENDS.

(V) VESTIBULAR - STAGGERS
BEND IN INNER EAR, STAGGERING GATE, DIZZINESS, CONFUSION, VOMITING, COLLAPSE, DEATH.

(N) NEUROGOLOGICAL (NERVE)

CEREBRAL (HEAD)	HEADACHE, CONFUSION CONVULSIONS, VOMITING, LOSS OF VISION, ANXIETY, COLLAPSE DEATH
SPINAL (SPINE)	GIRDLE PAINS, PINS & NEEDLES, NUMBNESS, PARALYSIS OF ARMS, LEGS, HALF OF THE BODY, ONE SIDE OF THE BODY. CONVULSIONS, VOMITING. DIFFICULTY URINATING,ANXIETY, COLLAPSE DEATH.

(P) PULMONARY (CHOKES)

EMBOLISM	BLOODY FROTH FROM MOUTH, CYANOSIS, DIFFICULT TO BREATH,. PAINS IN CHEST, CHOKING, COLLAPSE UNCONSCIOUSNESS, DEATH.
PHEUMOTHORAX	LUMP IN NECK, CRACKLING SKIN, DIFFICULT TO BREATH, CYANOSIS (GOING BULE) CHOKING, EXTREME PAINS IN CHEST. COLLAPSE UNCONSCIOUSNESS DEATH

D.C.I. CONTINUED.

BUBBLES CAUSE

1 COMPRESSION OF ARTERIES, NERVES, VEINS, SENSORY NERVES, LYMPHS, AND PAIN IN NON COMPLIANT TISSUES - BONE.
2. FOREIGN BODY RESPONSE - INFLAMMATION, LYMPH FEVER, COAGULATION, HAEMOGONIC CONCENTRATION.
3. SENSORY PERCEPTION FROM THE SPINAL CORD. - IE. PAIN IN ELBOW - PROBLEM IS ACTUALLY IN THE SPINAL CORD.

BUBBLES WILL

1. DAMAGE VEINS
2. CAUSE CLOTTING - PLATELETS WILL COMBINE - WHITE BLOOD CELLS WILL ACCUMULATE SO WILL TOXINS AND FAT.
3. CAUSE CHOKES - SOB.
4. PULMONARY ARTERY AND CENTRAL NERVOUS SYSTEM AND VENOUS PRESS. WILL GO UP.
5. ARTERIAL GAS EMBOLISM - EMBOLISM MEANS (FOREIGN BODY IN BLOODSTREAM. THIS WILL CAUSE LUNG RUPTURE / HOLE IN HEART / ARTERIAL GAS EMBOLISM / BRAIN EMBOLISM - SIGNIFIED BY LOSS OF CONSCIOUSNESS, LOSS OF FUNCTIONS WEAKNESS, CONFUSION, AND FITS.

TREATMENT IS I.V. DRIP, RECOMPRESSION, HIGH PPO2.

BECAUSE OF THE ABOVE, THE DIAGNOSIS AND THE TERMINOLOGY OF DESCRIBING A BEND HAS HAD TO CHANGE.

NEW DIVING TERMINOLOGY REGARDING BENDS - D.C.I.

EVOLUTION	ORGAN SYSTEM
PROGRESSIVE	NEUROLOGICAL
STATIC	CUTANEOUS (SKIN)
SPONTANEOUSLY RESOLVING	MUSCULO - SKELETAL
RELAPSING	PULMONARY (LUNG)

EACH OF THE ABOVE EVOLUTIONS AND ORGAN SYMPTOMS CAN BE CROSS REFERRED TO THE OTHER SIDE. NOTHING IS FIXED.

D.C.I. ILLNESSES - CAUSED BY

1. GASSES OUT OF SOLUTION
2. GAS EMBOLISM
3. DYSBARIC OSTEONECROSIS
4. REVERSE SQUEEZE PHENOMENA

COMMONEST PRESENTING SYMPTOMS

1. PAIN / PINS AND NEEDLES, REFERRED PAIN, 50 - 33%
2. HEADACHE / DIZZINESS 20 - 15%
3. LETHARGY 12%
4. NAUSEA / MUSCLE WEAKNESS / VISUAL DISTURBANCES SKIN RASH.

D.C.I. AND TREATMENT.

ABC OF FIRST AID.
RECOGNIZE AND MONITOR
OXY AND I.V. FLUIDS
COMPRESSION
MONITOR
(ABOVE IS THE RESPONSE IN SEQUENCE TO ALL D.C.I. ILLNESSES)

FITS AND TREATMENT

IF A DIVER FITS ON THE SURFACE ABC. THEN GIVE OXY. REMEMBER THAT EVEN IF FIT WAS A HYPEROXIC ACCIDENT AFTER THE FIT, THE DIVER WILL BE HYPOXIC. SO OXY HAS TO BE RE - ADMINISTERED. ALWAYS GIVE I.V. FLUIDS. AND TAKE BLOOD PRESS. WHEN DIVER IS QUIET. ALWAYS LAY DOWN FLAT.

USUAL CAUSES

HYPEROXIA
HYPOXIA
HYPERGLYCEMIC
HYPOGLYCEMIC

THE TEN COMMANDMENTS OF HE02 EMERGENCY PROCEDURES		
OVER 50	LOST GAS	USE THE EMERGENCY AIR TABLE ALL THE WAY TO THE SURFACE NO SUR "D".
50	LOST GAS	SHIFT TO EMERGENCY HE02 OR AIR CAN SUR "D" AFTER COMPLETION OF 30 STOP.
50	02 SYMPTOM	BRING DIVER UP 10, SHIFT TO EMERGENCY HE02 OR AIR. CAN SUR "D" AFTER COMPLETION OF 30 STOP.
40	LOST GAS	IF NOT WITHIN SUR "D" LIMITS SHIFT STRAIGHT ACROSS TO EMERGENCY HE02 OR AIR. CAN SUR "D" AFTER COMPLETION OF 30 STOP.
40	02 SYMPTOM	IF NOT WITHIN SUR "D" LIMITS BRING DIVER UP 10 SHIFT TO EMERGENCY HE02 OR AIR. CAN SUR "D" AFTER COMPLETION OF 30 STOP.
40	LOST GAS	WITHIN EMERGENCY SUR "D" LIMITS SUR "D" AND DOUBLE THE MISSED TIME AND ADD TO THE CHAMBER STOP.
40	02 SYMPTOM	WITHIN EMERGENCY SUR "D" LIMITS SUR "D" AND DOUBLE THE MISSED TIME AND ADD TO THE CHAMBER STOP.
40	LOST GAS	WITHIN NORMAL SUR "D" LIMITS, SUR "D"
40	02 SYMPTOM	WITHIN NORMAL SUR "D: LIMITS, SUR "D"
SUR "D" CHAMBER	LOST GAS	REMOVE MASK, FOLLOW EMERGENCY AIR TABLE OF THAT DIVE.
	02 SYMPTOM	REMOVE MASK ALLOW 15 MINUTES AFTER REACTION HAS SUBSIDED AND RESUME TREATMENT AT POINT OF INTERRUPTION.

OXYGEN (0^2) POISONING

PRIMARY SYMPTOMS = VENTID

V - VISION - ANY ABNORMALITY, TUNNEL VISION LIKE LOOKING THROUGHT A PIPE

E - EARS - ABNORMALITY IN HEARING

N - NAUSEA - VOMITING

T - TWITCHING - USUALLY APPREARS FIRST IN LIPS, CAN PROGRESS TO ARMS & LEGS, CULMINATING IN CONVULSIONS.

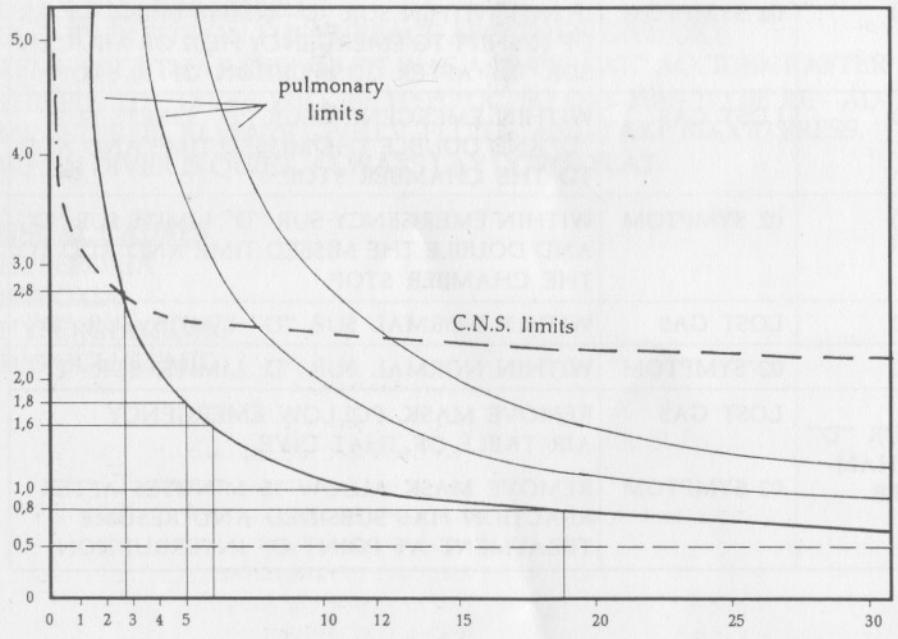
I - IRRITABILITY - ABJECT CHANGE IN BEHAVIOUR PATTERN ANXIETY, CONFUSION / FATIGUE

D - DIZZINESS

CURE - CUT OFF 0^2 FROM SURFACE IMMEDIATELY. ADDITIONAL SYMPTOMS MAY INCLUDE DIFFICULTY IN TAKING A BREATH, CLUMSINESS, OR INCOORDINATION.

PULMONARY OXYGEN TOLERANCE CURVES IN NORMAL MEN

(BASED ON VITAL CAPACITY CHANGES IN 50% OF THE SUBJECTS)



Pulmonary and neurological oxygen tolerance curves for continuous exposures of normal men. The pulmonary limited represent vital capacity charges in 50% of the exposed subjects. The curve defining C.N.S. limits represents a 10% incidence of neurological symptoms.

(From Lambersen -- 1968)

DIAGNOSIS OF DECOMPRESSION SICKNESS AND GAS EMBOLISM

SIGNS & SYMPTOMS	DECOMPRESSION SICKNESS: Skin	DECOMPRESSION SICKNESS: Pain Only	DECOMPRESSION SICKNESS: SERIOUS: CNS	DECOMPRESSION SICKNESS: SERIOUS: Chokes	GAS EMBOLISM: CNS SYMPTOMS: Brain Damage	GAS EMBOLISM: CNS SYMPTOMS: Spinal Cord Damage	GAS EMBOLISM: Pneumo-Thorax	GAS EMBOLISM: Mediastinal Emphysema
Pain-Head			□		■			
Pain-Back								■
Pain-Neck			□	■		□	■	□
Pain-Chest			■			□		
Pain-Stomach		■				□		
Pain-Arms/Legs		■				□		
Pain-Shoulders		■				□		
Pain-Hips			■	□	■	□	□	
Unconsciousness			□	□	■	□	□	
Shock			■					
Vertigo			■		■			
Visual Difficulty			■		■			
Nausea/Vomiting			■		■			
Hearing Difficulty			■		■			
Speech Difficulty			■		■			
Balance Lack			■		■	□		□
Numbness	□		■		■	□		
Weakness		□	■		■	□		
Strange Sensations	□		■					■
Swollen Neck			□	□	□	□	□	□
Short of Breath				□	□	□	□	□
Cyanosis								
Skin Changes	■							

■ Probable
□ Possible Cause

CONFIRMING INFORMATION

Diving History

	Yes	No
Decompression Obligation?	□	□
Decompression Adequate?	□	□
Blow-up?	□	□
Breath-hold?	□	□
Non-pressure Cause?	□	□
Previous Exposure?	□	□

Patient Examination	Yes	No
Does diver feel well?	□	□
Does diver look and act normal?	□	□
Does diver have normal strength?	□	□
Are diver's sensations normal?	□	□
Are diver's eyes normal?	□	□
Are diver's reflexes normal?	□	□
Is diver's pulse rate normal?	□	□
Is diver's gait normal?	□	□
Is diver's hearing normal?	□	□
Is diver's coordination normal?	□	□
Is diver's balance normal?	□	□
Does the diver feel nauseated?	□	□

PRINCIPLES OF DECOMPRESSION SICKNESS

All Companies have laid down tables and treatment tables which must be adhered to. However, in general treatment is based on four factors:

1) Recompression
2) Raised P.P. of oxy
3) Use of Heliox mix (eventually)
4) Adjunctive Drug Therapy.

The use of heliox mix as a therapeutic mix has increased over the years. In general it has been found that air divers can be treated by recompression breathing Heliox. But Heliox divers must never be recompressed for treatment using air or Nitrox as a breathing mix.

SAT TABLES

.6 PPO^2 600 MBS max oxy 24%

HELIOX	DEPTH	MIN PER FT	FT PER HR
IMPERIAL	400' - 200'	10	6
	200' - 100'	12	5
	100' - 50'	15	4
	50' - 0	20	3
ON CLOCK	2400 - 0600	STOP	
	0600 - 1400	DECOMP.	
	1400 - 1600	STOP	
	1600 - 2400	DECOMP.	

HELIOX .6 PP max 24% oxy.

METRIC	200 M - 15 M	40 MIN/MET.
	15 M - 0	60 MIN/MET.

AIR SAT

METRIC .66PP		
	30 M - 15M	120 MIN/MET.
	15 M - 0M	180 MIN/MET.

EMERGENCY SATURATION DECOMPRESSION

Only to be used in the direst circumstances, when to leave people in Sat would endanger their lives. Thought must be given to Hyperbaric Rescue Chamber as an alternative.

U.S.N. (UNITED STATES NAVY)

EMERGENCY SATURATION DECOMPRESSION TABLE

50-FOOT DIVE

50/120		50/240		50/360	
DEPTH	RATE	DEPTH	RATE	DEPTH	RATE
50-8	10 ft/min	50-10	10 ft/min	50-15	10 ft/min
8-3	2 min/ft	10-9	6 min/ft	15-12	2 min/ft
3-0	4 min/ft	9-5	4 min/ft	12-4	7 min/ft
		5-0	7 min/ft	4-0	9 min/ft

100-FOOT DIVE

100/120		100/240		100/360	
DEPTH	RATE	DEPTH	RATE	DEPTH	RATE
100-48	10 ft/min	100-52	10 ft/min	100-54	10 ft/min
48-35	1.5min/ft	52-48	1 min/ft		3 min/ft
35-22	4 min/ft	48-39	4 min/ft	54-47	10 min/ft
22-12	6 min/ft	39-26	6 min/ft	47-25	20 min/ft
12-0	9 min/ft	10-0	20 min/ft	25-0	*

150-FOOT DIVE

150/120		150/240		150/360	
DEPTH	RATE	DEPTH	RATE	DEPTH	RATE
150-90	10 ft/min	150-95	10 ft/min	150-95	10 ft/min
90-74	1 min/ft	95-90	1 min/ft	95-90	3 min/ft
74-53	3 min/ft	90-74	3 min/ft	90-60	10 min/ft
53-49	5 min/ft	74-44	10 min/ft	60-0	*
49-25	10 min/ft	44-0	20 min/ft		
25-0	20 min/ft				

200-FOOT DIVE

200/120	
DEPTH	RATE
200-130	10ft/min
130-100	1 min/ft
100-90	3 min/ft
90-56	10 min/ft
56-0	*

200/240	
DEPTH	RATE
200-135	10ft/min
135-115	1 min/ft
115-80	3 min/ft
80-0	10 min/ft

200/360	
DEPTH	RATE
200-136	10 ft/min
136-134	8 min/ft
134-98	10 min/ft
98-0	*

250-FOOT DIVE

250/120	
DEPTH	RATE
250-170	10 ft/min
170-155	1 min/ft
155-135	2 min/ft
135-130	3 min/ft
130-90	10 min/ft
90-0	*

250/240	
DEPTH	RATE
250-175	10 ft/min
175-170	1 min/ft
170-160	2 min/ft
160-120	10 min/ft
120-0	*

250/360	
DEPTH	RATE
250-182	10 ft/min
182-140	10 min/ft
140-0	*

300-FOOT DIVE

300/120	
DEPTH	RATE
300-210	10 ft/min
210-190	1 min/ft
190-170	2 min/ft
170-130	10 min/ft
130-0	*

300/240	
DEPTH	RATE
300-215	10 ft/min
215-200	2 min/ft
200-160	10 min/ft
160-0	*

300/360	
DEPTH	RATE
300-230	10 ft/min
230-185	10 min/ft
185-0	*

** Assume standard saturation dive decompression schedule*

350-FOOT DIVE

350/120	
DEPTH	RATE
350-250	10 ft/min
250-220	1 ft/min
220-170	11 min/ft
170-0	*

350/240	
DEPTH	RATE
350-250	2 ft/min
250-200	12 min/ft
200-0	*

350/360	
DEPTH	RATE
350-270	1 ft/min
270-230	12 min/ft
230-0	*

400-FOOT DIVE

400/120	
DEPTH	RATE
400-280	5 ft/min
280-260	2 min/ft
260-210	12 min/ft
210-0	*

400/240	
DEPTH	RATE
400-300	
300-250	10 ft/min
250-0	12 min/ft
	*

400/360	
DEPTH	RATE
400-330	10 ft/min
330-280	10 min/ft
280-0	*

450-FOOT DIVE

450/120	
DEPTH	RATE
450-310	5 ft/min
310-280	12 min/ft
280-0	*

450/240	
DEPTH	RATE
450-340	1 ft/min
340-300	12 min/ft
300-0	*

450/360	
DEPTH	RATE
450-370	3 ft/min
370-320	12 min/ft
320-0	*

500-FOOT DIVE

500/120	
DEPTH	RATE
500-360	10 ft/min
360-300	12 min/ft
300-0	*

500/240	
DEPTH	RATE
500-390	2 ft/min
390-340	12 min/ft
340-0	*

500/360	
DEPTH	RATE
500-420	30 ft/min
420-370	12 min/ft
370-0	*

** Assume standard saturation dive decompression schedule*

EAR INFECTIONS. SWABS

Since the early 70's when it was first found in divers' ears, P.Y.O (Pseudomanas Aeruginosa) has been one of the main causes of ear infections in Sat.

In areas of regulation Swabs must be taken every other day and samples kept in containers stored at 4^0C or below and sent ashore for analysis. All samples should be marked with worksite, date, divers name, right or left ears.

PYO is a bacteria held in the bowel, hence toilet cleanliness is essential. The two major disinfectants on the market to counter this bacteria are Panacide & Panaclean.

Panacide. The main disinfectant diluted with water 1- 100. Drums held in T.U.P. containing 1 - 500 solution for pouring down toilet after flushing.

Panaclean. Panacide and detergent mix used for the intial scrub of DDC and toilets, etc. Diluted with water 1 - 200 and mixed with equal amount of Panacide at 1 - 1000.

Preventitive Ear drops Aluminium Acetate in 2% alkaline solution or Domeboro.

Treatment Drops. Gramiciden. Usual supply is bottles of Polymixen Gentimycen.

$$\text{eg. 35 litres} = \frac{35000 \text{ mlts}}{1000} = 35 \text{ ml}$$

$$Cm^3 = CC = \text{mlts}$$

Preventitive Ear Drops

Use everyday, label bottles for each ear, place 3 - 4 drops in each ear, leave head on one side for 5 min. Use each morning and evening, and after a bell run or shower. Dry the outside of the ears with a towel. Do not push anything inside it.

Treatment Ear Drops

Use as soon as the diver feels irritation, treat both ears, do not allow treatment dispenser to touch the ear. Treat 4 times per day for one week. Panadol can be given as a pain killer, but beware of hiding pains if decompressing. No divers should share medication.

Panacide and Panaclean must not be used with other detergents or disinfectants eg. Teepol, Dettol, Savlon, Soap, as they counteract its effect. Shower areas, toilets, etc. should be washed or sprayed 3 times daily with Panacide. Diving suits and hoods, etc should be soaked in diluted Panacide outside DDC and dried.

IN CASE OF ALL ACCIDENTS RECORD

1) Time of accident, date, name.
2) Type of decompression accident or injury.
3) Place accident occured - underwater, surface.
4) Decompression Table in use or type of treatment given to injured person.
5) Present status, and depth.
6) Full details of medical gasses or what treatment you have available and at your disposal.
7) Diving report.
8) DDC Monitoring Report.
9) Statements from personnel.
10) Gas samples.
11) Voice recording.
12) Running Log.
13) Medics Report.
14) Sketches or Photos.

EXAMINATION OF A DIVING CASUALTY

Patient _____ Date _____

Life Sustaining Functions

1. Breathing _____ 3. Hemorrhage _____

_____ _____

2. Heart _____ 4. Schock _____

_____ _____

Blood Pressure Temp.

Neurological Examination

MENTAL CONDITION OR STATUS

1.Orientation:-
Who are you? _____

Where are you? _____

What time is it? (day/date/hour)

_____

2.Memory: What did you do on the job? _____

Recent _____

Remote _____

SENSORY NERVES

1. Sharp vs. Dull R ___ L ___

MOTOR NERVES

1. Muscle strength R ___ L ___
2. Range of motion R ___ L ___
3. Muscle tone R ___ L ___

CRANIAL NERVES

1. Sight R ___ L ___
2. Eye movement R ___ L ___
3. Mouth, smile R ___ L ___
4. Tongue R ___ L ___
5. Hearing R ___ L ___
6. Talking R ___ L ___

COORDINATION

1. Rhomberg test
2. Point in space R ___ L ___
3. Finger to nose
4. Gait, walking
   Tandom

Examiner _____ Organization _____

Comments or conclusions _____

_____

_____

_____

TRANSPORTING A BEND CASE

You may be unfortunate enough to have to transport a bend case some distance, possibly hundreds of miles to the nearest compression chamber.

1) Turn relevant side up
2) Give 100% oxy at 20 min 5 min break, 20 min. 5 min break, etc.
3) Administer 10 mg Ringers Solution then 4 mg every 2 hours. Plus 10 mg Decadron Intravenously. This would stop any oedema, or help to control it.

Definitely, wherever possible avoid flying. If this is not possible, instruct Pilot to make efforts to fly as low as possible preferably below 1000 ft.

GUIDE TO FLYING AFTER DIVING

	2000 FT 600 M	8000 FT 2400 M
AIR DIVING - NON STOP DIVES Bottom time max. 60 min. in last 24 hrs.	2 hrs	4 hrs
ALL OTHER DIVES max. 4 hrs under press.	12 hrs	12 hrs
AIR OR NITROX SAT More than 4 hrs under press.	24 hrs	48 hrs
MIX GAS DIVING HELIOX No flying at all under Incorporates bounce diving & sat.	12 hrs	
FOLLOWING A BEND		
Successfully Treated	24 hrs	48 hrs
No Successfully Treated	Seek medical advice	

GUIDE TO DIVING AFTER A DECOMPRESSION ACCIDENT

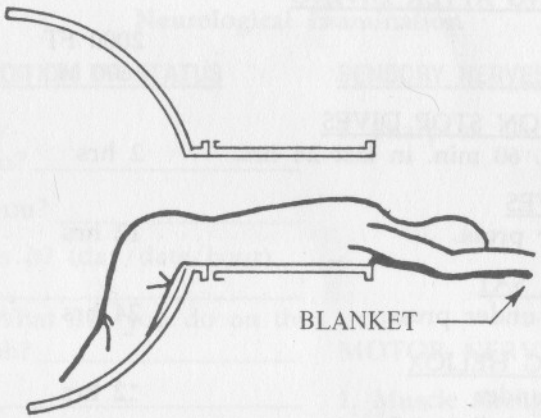
Type 1 'B" Bend full recovery	24 hours
Type 1 "B" Bend re-occurrence during or after	7 days plus exam by doctor
Type 2 CNS Serious symptoms All circumstances	7 days plus exam by doctor
Pulmonary Baratrauma Embolism, Squeeze, Phneumothorax	3 months plus exam by doctor

PROCEDURE FOR TRANSFERRING AN UNCONSCIOUS DIVER THROUGH DDC HUB

1) Place a blanket in the Hub.

2) Lay the diver on the blanket in the Hub and pull him by the blanket until the diver can be grasped properly.

3) Place the diver in such a position as to be able to continue artificial respiration or necessary first aid.



CHAMBER EMERGENCY - PRACTICE AND PROCEDURES

Every diver who enters a D.D.C. has a professional obligation to himself and others to be completely familiar with hyperbaric conditions ie. knowledge of all valve functions, respiration system, transfer systems, hygiene systems, etc.

The following procedures must be thought about and practiced:

- Loss of Pressure
- In case of Fire
- In case of toxic gas production (smoke, CO^2)
- Transferring an unconscious divers between compartments

PROCEDURE IN CASE OF A FIRE

(see Zones of Combustion Chart). There should be two emergency procedures:

1) Within the Zone of Incomplete Combustion

a) Let the surface know.
b) Commence evacuation. The nearest person to the fire starts to fight the fire whilst the rest evacuate. When the last person has evacuated, he leaves the extinguisher behind and he himself evacuates, pulling door behind him. (The heat from the fire will seal the door.) The first diver who evacuated shut regen & equalizing valves.
c) Go onto bibs.

2) Within the Zone of Complete Combustion

a) Evacuate the chamber as quickly as possible.
b) Let surface know
c) The last diver out closes door.
d) Everyone on bibs.

Note:
In the zone of complete combustion you will have to be fast. The fire will flash quickly. It is unlikely you will have time to use the extinguisher. Remember, Think! Flash fires have been started in this zone from things as simple as a diver grinding loose sugar underfoot on the plates.

LOSS OF PRESSURE

There are basically two procedures:

A) Ordinary Leak

Find the leak using cloth (not one's hand). Shut the appropiate valve if this is not possible plug the penetration with a convenient object.

Note: The natural reflex of shutting all valves is to be avoided, especially do not shut off the press.-ups vvs.

B) Big Leak

Impossibility of compensating the loss. (Note: In bells you should consider fabricating a bell port blow-out seal - a plate, handle one side and rubber the other.) You should evacuate the chamber, the first diver out closes equalizing and regen valves. Last diver out closes the door.

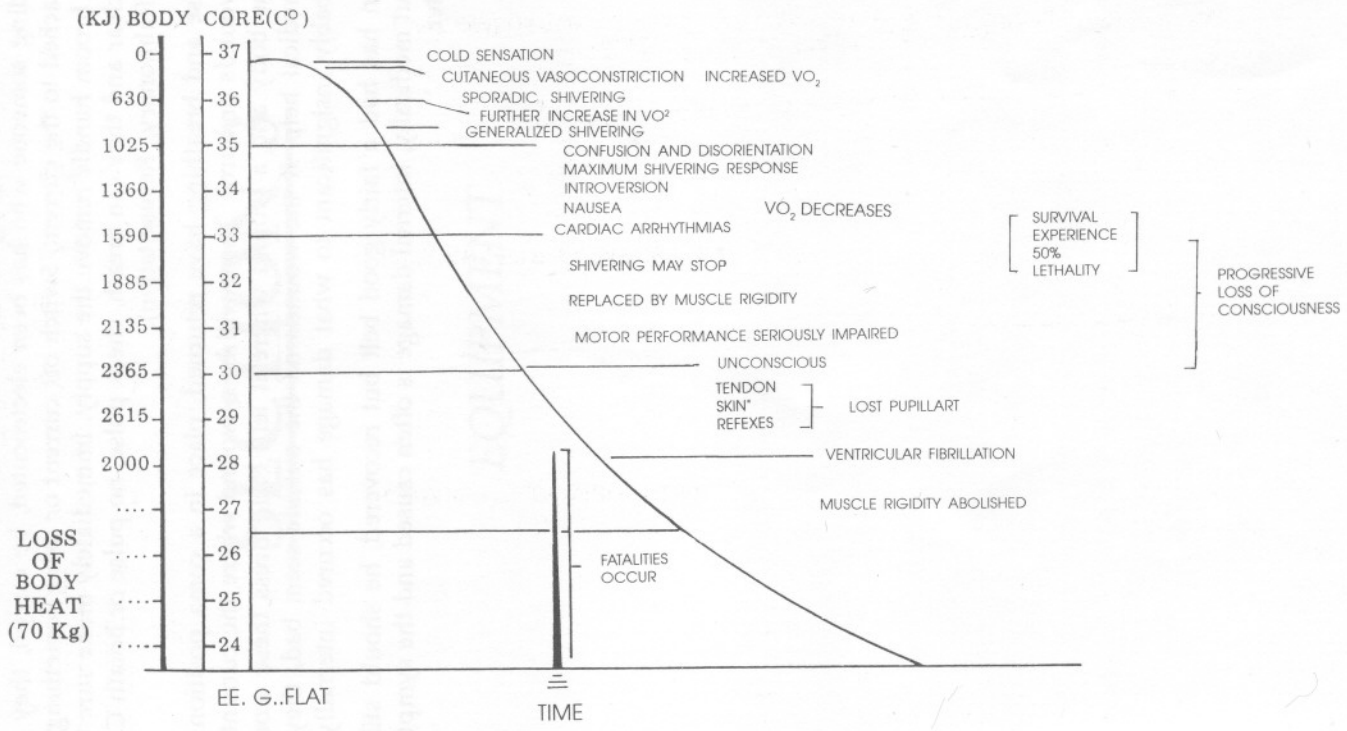
Unable to Evacuate.

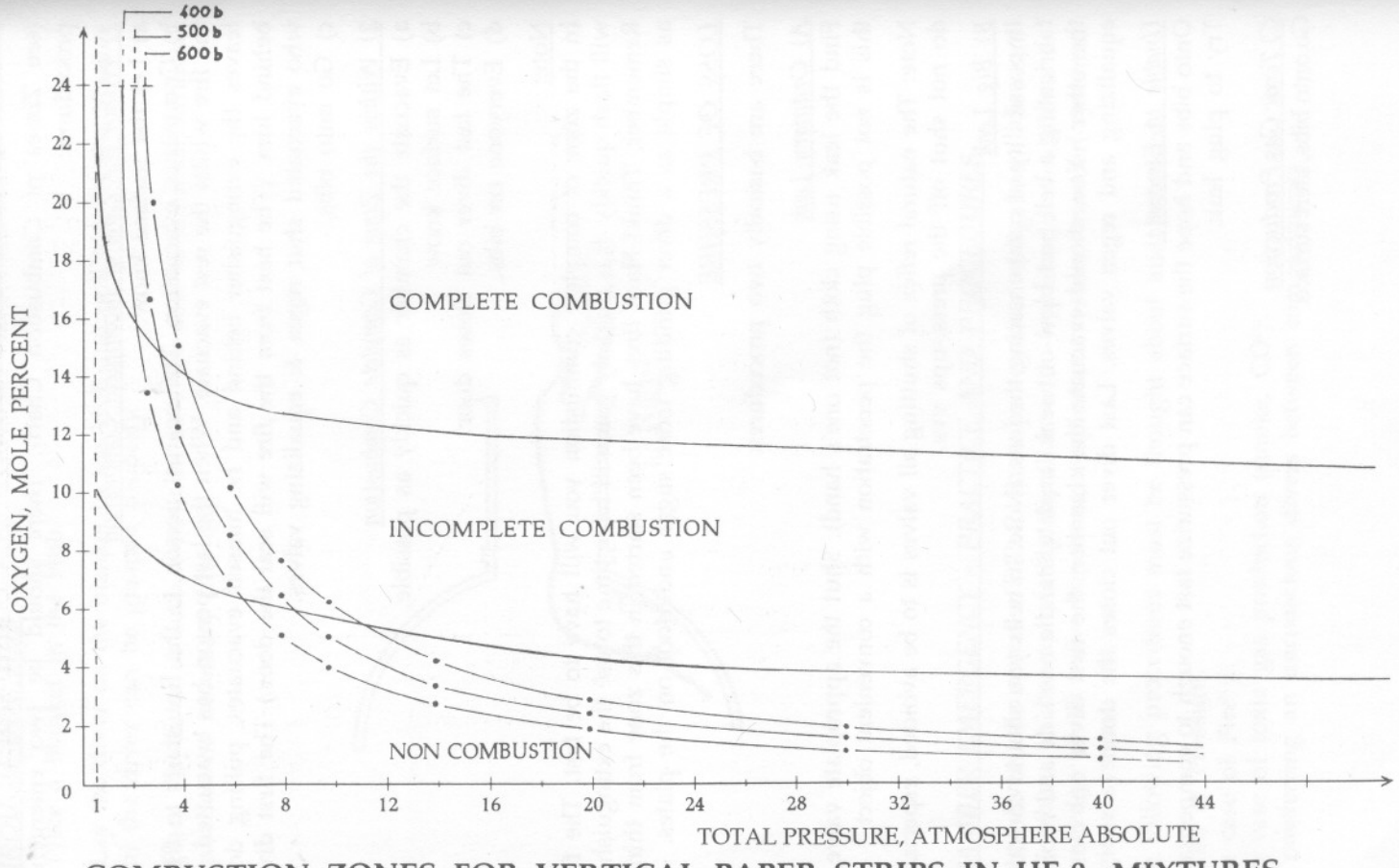
Onto bibs and hope the surface can pressurize fast enough to compensate. Try to plug leak.

C) Toxic Gas Production

Go onto bibs, alert surface.

PHYSIOLOGICAL EFFECTS OF HYPOTHERMIA





COMBUSTION ZONES FOR VERTICAL PAPER STRIPS IN HE-0_2 MIXTURES

ELECTRICAL SHOCK

When finding someone who has been electrocuted, be careful, they may still be attached to the current. Switch off current or using something like a wooden broom handle remove the supply. Immediately make sure their mouth is clear and they can breath, check pulse, no pulse or breath C.P.R. (Cardiac, Pulmonary, Resuscitation).

When pulse and breathing have returned, place in a coma position and look for wounds or burns. There will be a wound where the current has entered the body and a wound where it left. Field dress these wounds and get medical help. If the wounds on the outside seem bad, they are more probably insignificant to what damage has occured internally.

If a person has had a fairly good belt but recovered, he should still be checked out medically, internal damage is often caused and the symptoms surface later.

SECTION 3

EQUIPMENT