

*Emergency Procedures*

*Sailing Yacht*

*Helena*

AMSTERDAM  
THE NETHERLANDS

**DON'T PANIC!**



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Dive Quick Accident Response Guide

# First Aid Basics

In an emergency remember to:

1. Stop
2. Breathe
3. Think
4. Act

## Circle of Care

1. Arousal
2. Establish an Airway
3. Check for Breathing
4. Check for Pulse
5. Check for Bleeding
6. Shock Management

## Arousal

Tap on the shoulder and shout, "Are you okay?" This step is to help determine the conscious level and responsiveness of the patient.

## Establish an Airway

If there is no response to the tap and shout, establish an open airway using either the jaw-thrust or the head-tilt/chin-lift.

## Check for Breathing

Look, listen, and feel for breathing. If not breathing, initiate mouth-to-mouth respiration.

## Check for Circulation (Pulse)

Check the carotid pulse to determine if the patient has a heartbeat. If there is no pulse, a combination of artificial circulation and mouth-to-mouth respiration must be performed. Full CPR should be continued as long as necessary giving victim two full breaths every 15 chest compressions.

## Check for Bleeding

Once the heart is pumping blood, either naturally or artificially, the victim must be checked for serious bleeding. Both visually scan and feel the body for indications of heavy blood. Any serious bleeding must be controlled or the victim will bleed to death.

## Shock Management

Signs and symptoms of shock may include:

- Shallow breathing, labored gasping, noisy inhalation exhalation.
- Pale tissue color.
- Moist, clammy skin.
- Rapid, weak pulse.
- Restlessness and anxiety.
- Nausea, vomiting and thirst.
- Mental confusion.

## Shock Treatment:

- Maintain body temperature, but do not overheat.
- Keep patient lying down.
- Elevate legs unless other conditions indicate otherwise.
- Give nothing by mouth
- Seek professional medical help by activating an Emergency Medical Service.

Compiled by Pedro Paixão (safediving@yahoo.com) mainly from Dive Medicine Online (<http://www.gulftel.com/~scubadoc/>)

# Used Icons



Transfer to Recompression Chamber



Transfer to the Hospital



No Need to Transfer Give First Aid

## Local Emergency Phones

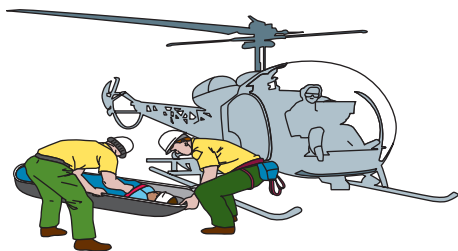
Name	Phone

## Diving Emergency Phones

Name	Phone
DAN America	1-919-684-8111
DAN America-Mexico	52-5-6299800 code 33937 or 4258
DAN Europe	41-1-383-1111
DAN Japan	81-3-3812-4999
DAN Southern Africa (Outside South Africa)	27-11-242-0112
DAN Inside South Africa (Toll Free)	0800-020111
S.E. Asia-Pacific Region	
DES Australia	
Within Australia	1-800-088-200
From Overseas	61-8-8373-5312
DES New Zealand	64-9-4458454
Singapore Naval Medicine & Hyperbaric Center	65-750-5546
DAN S.E.A.P. -Philippines	63-2-815-9911

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# Air Embolism



## WARNING

Transport to nearest emergency facility closely associated with a recompression chamber. Do not waste time evaluating and stabilizing at a facility unaccustomed to diving emergencies. **This is possibly the most important thing you can do!**

Call DAN or your own preferred emergency number!

Air evacuation should be at sea level pressure or as low as possible in unpressurized aircraft

Contact hyperbaric chamber, send diver's profile with the diver, and send all diving equipment for examination or have it examined locally.

## SYMPTOMS APPEAR DURING OR IMMEDIATELY AFTER SURFACING

### Symptoms

- Disorientation
- Chest pain
- Paralysis or weakness
- Dizziness
- Blurred vision
- Personality change
- Voice change in tonal quality (mediastinal air)

### Signs

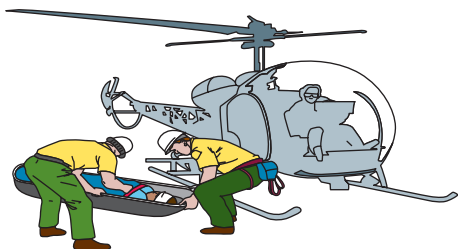
- Bloody froth from nose or mouth
- Paralysis or weakness
- Unconsciousness
- Convulsions
- Stopped breathing
- Apparent Death

### Early Management

- CPR, if required
- Open airway, prevent aspiration, intubate if trained person available
- Give O<sub>2</sub>, remove only to open airway or if convulsions ensue. Mask, if available
- If conscious, give nonalcoholic liquids
- Place in horizontal, neutral position
- Restrain convulsing person loosely and resume O<sub>2</sub> as soon as airway is open
- Protect from excessive cold, heat, water or fumes

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# Decompression Sickness



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Transport to nearest emergency facility closely associated with a recompression chamber. Do not waste time evaluating and stabilizing at a facility unaccustomed to diving emergencies. **This is possibly the most important thing you can do!**

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Air evacuation should be at sea level pressure or as low as possible in unpressurized aircraft

Contact hyperbaric chamber, send diver's profile with the diver, and send all diving equipment for examination or have it examined locally.

## SYMPTOMS APPEAR 15 MINUTES TO 12 HOURS AFTER SURFACING

### Symptoms

- Tired feeling
- Itching
- Pain, arms, legs or trunk
- Dizziness
- Numbness, tingling or paralysis
- Chest compression or shortness of breath
- Anything unusual after the dive

### Signs

- Blotchy rash
- Paralysis or weakness anywhere in the body
- Coughing spasms
- Staggering or instability
- Unconsciousness
- Personality change

### Early Management

- Stabilize patient the same way as for Air Embolism
- Urgent recompression after stabilization in trauma facility closely associated with a recompression chamber
- Immediate oxygen breathing, continue even if person improves markedly. Use a mask, if available.
- Always take to recompression treatment for all forms of decompression sickness

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# Lung Over-Expansion



## Pneumothorax

## Mediastinal Emphysema

Symptoms	Signs
<ul style="list-style-type: none"><li>Disorientation</li><li>Chest pain</li><li>Paralysis or weakness</li><li>Dizziness</li><li>Blurred vision</li><li>Personality change</li><li>Voice change in tonal quality (mediastinal)</li></ul>	<ul style="list-style-type: none"><li>Bloody froth from nose or mouth</li><li>Paralysis or weakness</li><li>Unconsciousness</li><li>Convulsions</li><li>Stopped breathing</li><li>Apparent Death</li></ul>
Early Management	
<ul style="list-style-type: none"><li>CPR, if required</li><li>Open airway, prevent aspiration, intubate if trained person available</li><li>Give O2, remove only to open airway or if convulsions ensue. Mask, if available</li><li>If conscious, give nonalcoholic liquids</li></ul>	

ALWAYS ASSOCIATED WITH PNEUMOTHORAX	
Symptoms	Signs
<ul style="list-style-type: none"><li>Disorientation</li><li>Chest pain</li><li>Paralysis or weakness</li><li>Dizziness</li><li>Blurred vision</li><li>Personality change</li><li>Voice change in tonal</li></ul>	<ul style="list-style-type: none"><li>Bloody froth from nose or mouth</li><li>Paralysis or weakness</li><li>Unconsciousness</li><li>Convulsions</li><li>Stopped breathing</li><li>Apparent Death</li></ul>
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# Allergies and Poisoning



## Mollusks (Cone shells, Blue-ringed Octopus)

- Immobilize
- Pressure dressing
- Cleanse puncture site
- Tetanus
- Analgesics
- Topical antibiotics
- CPR, if necessary, to treat possible respiratory distress or paralysis
- To a facility as soon as possible

## Sea Snakes

- Recognize that there are few symptoms early on
- Immobilize site
- Hospitalize immediately because of possible need for respiratory support
- Give sea snake antivenin
- Polyvalent land snake antivenin can be used
- Hemodialysis useful if no antivenin available
- CPR, if needed

## Stinging Fishes (Stingrays, Scorpionfish)

- Immobilize
- Remove spine and debride (scrub) the wound
- Irrigate wound
- Soak in hot water (thermolabile toxin) 50 degree C. for 30 to 90 minutes
- Tetanus treatment
- Treat for shock, hydrate
- Topical antibiotics
- Local injection Emetine 50 mg if available
- Stonefish antivenin (Australia Commonwealth Serum Lab.)
- Heat for pain

## Severe Allergic Reaction

- Remove any remnant of allergen (i.e., jellyfish tentacles, foreign material)
- Epinephrine injection, if available
- Decadron injection or tablets
- Antihistamine, if available
- Wash out wounds or injury with alcohol, vinegar or sea water
- Call for help and immediate transport
- Treat for shock
- CPR if no pulse or respirations
- Keep warm
- Oxygen
- Pain relief, if available

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# Near Drowning



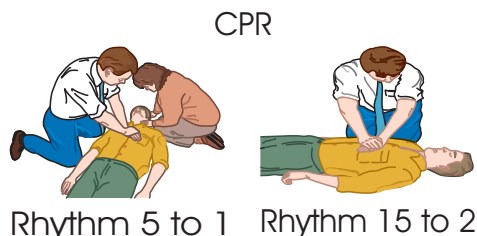
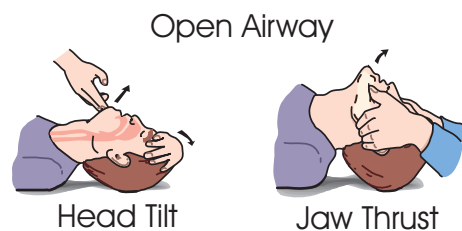
## Recognition

- Unconsciousness
- Lack of respirations
- Cyanosis (bluish pallor, face lips, nail beds)

Try to identify the time the victim was last seen breathing
Free entanglements if present
Maintain control of victim
Positive buoyancy of the victim, drop victim weight belt, inflate victim BC
Rescuer maintains dive status
Controlled ascent
On surface - open airway
Rescue breathing if necessary
Signal for help
Start CPR, removal of gear and in water transport to the boat or shore
In dive boat, horizontal position
Immediate call for help and transport to a facility
Assess ABC's-airway, breathing and circulation
Clear airway
Chest compression if no carotid pulse felt
Continue rescue breathing begun in the water
Oxygen
Consider the possibility of concurrent hypothermia (low body core temperature)
Do not use Entonox (Nitrous oxide/oxygen)
Do not use PASG (MAST) trousers

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**WARNING: DON'T DO CPR IF YOU FEEL THE VICTM'S PULSE**



# Other Accidents



## Oxygen Toxicity (with convulsions)

**SYMPTOMS ARE USUALLY TOO LATE TO BE HELPFUL**

Symptoms	Signs
<ul style="list-style-type: none"> <li>• Nausea</li> <li>• Dizziness</li> <li>• Ringing in the ears</li> <li>• Abnormal vision</li> <li>• Confusion</li> </ul>	Decreased or loss of consciousness followed by Convulsions
Treatment=Prevention	
<ul style="list-style-type: none"> <li>• Avoidance of gases with high O2 concentrations (as in Nitrox at inappropriate depth)</li> <li>• Avoid CO2 retention which can precipitate O2 convulsions at any depth</li> <li>• If convulsions occur at depth, be prepared to treat near drowning and /or air embolism</li> </ul>	

## Suspected Heart Attack, Stroke

- Call for help and immediate transport
- Treat for shock
- CPR if no pulse or respirations
- Keep warm
- Oxygen
- Pain relief, if available
- Aspirin

## Severe Trauma or Large Predator Injury

(head injury, limb injury due to falls, equipment crush, prop injuries)

- Call for help and immediate transport
- Open airway
- Treat for shock on site and stabilize before evacuation
- Face up neutral position
- Direct pressure over bleeding wounds
- CPR if no pulse or respirations
- Keep warm
- Be aware of the possibility of neck injury
- O2 if any question of hypoxemia (Low oxygen in the blood)
- Splint limb injuries

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# Poisoning



## Paralytic shellfish, Elasmobranch, Tetrodotoxin and Clupeotoxin Poisoning

- Notify all who may have eaten the same food
- Induce vomiting, if they haven't already done so
- Respiratory paralysis can be fatal
- O2 if short of breath
- Life support and CPR
- Hospitalize immediately

## Scombroid

- (Similar to paralytic shellfish poisoning except due to severe allergic reaction.)
- Ventilation and CPR
- Hospitalize

## Ciguatera

- Treat as paralytic shellfish poisoning
- Oral fluids
- Diphenhydramine, if itching
- R/O diving illness
- Transport to a medical facility

# Thermal Problems

## Hypothermia

- Keep core temperature above 95 degrees F.
- Keep airway open
- Immobilize
- Wrap in blankets, preferably next to another person
- Basic life support, CPR, if needed
- Warm liquids, if alert, unless very cold then avoid due to possibility of ventricular tachycardia (rapid, useless fluttering of the heart)
- Avoid O2 due to the cooling effect, unless the O2 is humidified and warm. (Nemiroff coffee jug technique)

## Hyperthermia

- Heat Exhaustion (due to excessive fluid loss)
- Remove from source of heat
- Lower temperature
- Keep calm
- Keep airway open
- Give salt (1 tsp/8 ounces water)

## Heat Stroke

- Remove all clothing
- Cover with cool wet sheet
- Place in air-conditioned area
- O2 Cold packs to neck, scalp, groin and armpits
- Treat convulsions if they occur

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# Hazardous Marine Life Injuries



## Coral and Barnacle Cuts

- Stop bleeding
- Clean well with a brush, soap and water
- Alcohol or vinegar flush
- Scrub and debride foreign particles
- Bed rest, elevation, antibiotics for severe cuts
- Be aware of danger of anaerobic infection and clostridial infection
- Topical antibiotics

## Coelenterate Injury

(fire coral, hydroids, Jellyfish, sea wasps, sea anemones)

- Injury all caused by nematocysts
- Flush with alcohol or vinegar or dilute household ammonia (1:3 water)
- Flush with saline or sea water, no fresh water
- Meat tenderizer
- Non-steroidal anti-inflammatory cream (where available, Not in USA)
- Pain relief, sedation, diphenhydramine
- Be aware of possible severe systemic reactions
- Shaving cream, shave or flush

## Sea Lice

(Caused by nematocysts in Thimble jellyfish larvae)

- Remove clothing
- They should be flushed off with sea water-not rubbed off
- or washed off with fresh water or they will fire off
- Spraying on shaving cream and washing the cream off along with the nematocysts

## Batfish Punctures

- Remove any residue
- Hot water immersion 30 minutes

## Echinoderms (Sea Urchins)

- The small black dots may not be the tips of the spines but dye and will be eventually absorbed by the body
- Hot water 30 minutes
- Do not beat or pound the part to "crush" the spines
- Surgical removal is indicated only if a granuloma (hard knot) is formed or if it gets infected and needs pus to be drained
- NSAID for anti-inflammatory effect and pain relief
- Topical antibiotics

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- Topical antibiotics

## Sponges

- Deactivate toxins, acetic acid 5%, 10-15 minutes or isopropyl alcohol soaks for 10 minutes
- Sticky side of adhesive tape
- Repeat soaks and tape
- Steroid cream

## Segmented Worms, Bristle Worms

- Acetic acid (Vinegar) to bites of blood worms
- Remove bristles with forceps or adhesive tape
- several times, ammonia 3:1, isopropyl alcohol

## Starfish Injuries

- Hot water immersion 30 minutes
- Debride
- Soap and water scrub and rinse
- Monitor for infection

## Catfish Injuries

- Hot water immersion 30 minutes
- Debride
- Rinse with soap and water

## Stress, Anxiety and Hyperventilation

### Reassure

- Reassure
- Slow down respiratory rate
- O2
- Rebreathe in a paper bag
- Do not encourage further diving

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# Nitrogen & Carbon Dioxide



## Nitrogen Narcosis

Symptoms	Signs
<ul style="list-style-type: none"> <li>• Inflexible mentation (thinking)</li> <li>• Decrease or loss of judgment</li> <li>• False sense of security</li> <li>• Lack of concern for safety</li> <li>• Inability to think through problems</li> <li>• Panic</li> <li>• Near unconsciousness or loss of consciousness at depth</li> </ul>	<ul style="list-style-type: none"> <li>• Inappropriate behavior at depth</li> <li>• Ignoring hand signals and instructions</li> <li>• Stupor or coma</li> </ul>
Treatment=Prevention	
<ul style="list-style-type: none"> <li>• Ascend until free of symptoms</li> <li>• Surface with controlled ascent</li> <li>• Intense counseling session!</li> </ul>	

## Carbon Dioxide Poisoning

Symptoms	Signs
<ul style="list-style-type: none"> <li>• Rapid breathing</li> <li>• Feeling of suffocation, shortness of breath, impending doom and panic</li> <li>• Headache, nausea, dizziness</li> <li>• Rapid heartbeat</li> <li>• Confusion and unclear thinking</li> </ul>	<ul style="list-style-type: none"> <li>• Slowed responses</li> <li>• Muscle irritability (twitching)</li> <li>• Loss of consciousness</li> </ul>
Treatment=Prevention	
<ul style="list-style-type: none"> <li>• Remove the cause ( skip breathing, over-exertion, equipment failure, rebreathers, etc.)</li> <li>• Stop and rest during early symptoms to avoid loss of consciousness</li> <li>• Surface</li> <li>• Consider O2 toxicity if diving with EAN.</li> </ul>	

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# Ear Problems & Sea Sickness



## Tips for Equalizing

1. Several hours before the dive gently equalize your ears every few minutes
2. Try it again before you go on board the boat
3. Equalize at the surface before you go down
4. Descent feet first
5. Don't descent too fast, try using a descent line
6. Equalize often and before you feel pain
7. If it hurts, stop, ascend a few feet try again
8. You should equalize whenever you need not only during descent
9. Keep mask clear

## WARNING

- Do not dive if you cannot Equalize properly
- Discontinue all diving if you suffer Ear Barotrauma and see an Ear Mouth Throat (ENT) Specialist ASAP

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## Inner Ear Barotrauma

- Recognize round or oval window damage( loss balance, ataxia, tinnitus, deafness)
- Headup and affected ear elevated
- Discourage straining
- ENT evaluation, no more diving until cleared by ENT

## Middle ear barotrauma

- Keep quiet and calm
- Without DCS or rupture of the round or oval windows, give
- Benadryl 25 mg po, Claritin po or Sudafed.
- Antibiotics po if marked fluid accumulation in middle ear.
- Get ENT evaluation
- Discontinue diving until cleared by ENT

## Sea Sickness

- The best medications have been found to be "Meclizine", "Bonine", Dramamine and Trans-derm Scop.
- Keep your eyes on the horizon
- Stay on deck
- Keep yourself well hydrated with non-alcoholic beverages
- Try antacid tablets or lemon drops. If diving, try to be the first diver in from a heaving boat.
- Check our web site at <http://www.gulftel.com/~scubadoc/seask.html>

# First Aid Kit

- Gloves
- Cortisone Cream 1%
- Q-Tips
- Deodorant cleansing soap (antibacterial)
- Lighter or waterproof matches
- Tongue depressors
- Household Vinegar solution (neutralize jellyfish stings)
- Absorbent dressings (control severe bleeding with pressure)
- Disposable cups
- Household ammonia
- Squeeze bottle of water, 6 oz. (irrigating eyes and wounds)
- Razorblades, single edged
- Antibiotic Ointment
- Squeeze bottle of sterile saline
- Shaving cream
- Non-aspirin pain reliever
- Sterile cotton, gauze pads, and adhesive tape
- Tweezers or forceps
- Hot pack
- Backboard, splints and neck brace, if space permits
- Bandage scissors
- Cold packs (pain relief)

- Pocket mask (eliminates direct contact while resuscitating a person)
- Needle nosed pliers with wire cutters (to remove fishhooks)
- Denatured alcohol, 12 oz. bottle (sterilizing instruments)
- Penlight
- Band-Aids and butterfly bandage
- Telfa pads or plastic wrap (cover burns)
- Space blankets
- Seasickness medication

O2 is an absolute necessity on a Dive Boat.

Oxygen is the one first aid treatment that can be used with the full knowledge that it can only help and usually is the one treatment that will turn a serious diving injury around. It is the first thing you should think of in all serious decompression illness and should be used even if you're uncertain of its need.

For purposes of hospital and insurance follow-up and to avoid any legal problems, it would be a good idea to record as many of the events as possible during an episode. A pen and small notebook would be good to have in this respect.