Basic Life Support: CPR, AED, FBAO

Scene Safety Assessment

S	Stop
A	Assess the scene
F	Find oxygen unit, first aid kit and AED, and take to injured person
E	Exposure protection

Initial Assessment (adults and children)

- Assess responsiveness and normal breathing
  - Tap the person's collar bone or shoulder and loudly ask "Are you OK?"
  - State your name and your desire to help
- If the person responds, have them remain in the position found or position of comfort
- If unresponsive but breathing normally, place in recovery position
- If not breathing normally, begin CPR
  - Shout for help or send a specific person to activate EMS

CPR – Adult (one rescuer) Do not delay CPR to wait on an AED or other equipment.

- Use nipple line to find landmark at center of chest for compressions
- Deliver 30 compressions (at least 100-120 per minute)
- Deliver 2 normal breaths, about 1 second each, using barrier device
- Continue CPR cycles of 30:2

Two Rescuers

- One rescuer does chest compressions.
  - Pause compressions for ventilations then immediately resume compressions
- Second rescuer provides rescue breaths
- Switch roles every 2 minutes or after 5 cycles of 30:2

CPR for Children (one rescuer) Do not delay CPR to wait on an AED or other equipment.

- Begin chest compressions using heel of one hand to about 1/3 chest depth
- After 2 minutes of CPR, call EMS if someone has not already done so
- If available, use AED as with an adult; use pediatric pads if available

Two Rescuers

- One rescuer performs compressions, second rescuer performs rescue breaths
- Use same technique as describe above
- Compression to ventilation ratio changes to 15:2
- Pause compressions for ventilations

CPR for Infants (one rescuer)

- Assess responsiveness: Tap bottom of foot and loudly ask "Are you OK?"
- Check for presence of normal breathing and a definite pulse (inside upper arm)
- If unresponsive and not breathing normally, begin CPR
  – Place two or three fingers in the center of the chest between the nipples
- Compress about 1/3 the diameter of the chest; Compression to ventilation ratio of 30:2
- After 2 minutes of CPR, take the infant with you to call EMS if not already done
- If available, use AED placing pads in center of both chest and back (use pediatric pads if appropriate and available)

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Basic Life Support: CPR, AED, FBAO

CPR for Infants (two rescuers)

- One rescuer performs compressions, second rescuer performs ventilations
- Compression to ventilation ratio changes to 15:2
  - Rescuer performing compressions can switch to hands circling the chest and two thumbs for compressions
- Pause compressions for ventilations

Person	One Rescuer	Two Rescuers	How to Compress	Depth
Adult	30:2 ratio	30:2 ratio	Two hands stacked	5-6 cm (2-2 1/2 inches)
Child	30:2 ratio	15:2 ratio	Heel of one hand or two hands stacked	5 cm (2 inches) or 1/3 chest depth)
Infant	30:2 ratio	15:2 ratio	Two or three fingers (1 rescuer); two thumbs (2 rescuers)	3.5 cm (1 1/2 inches) or 1/3 chest depth)

Using an AED

- Continue chest compressions while AED is being set up
- Expose and dry the person's chest
  - Shave off chest hair if necessary
- Turn on the unit, and follow prompts provided by the unit
- Allow AED to analyze heart rhythm
- If the AED indicates "shock advised,"
  - Clear the scene both verbally and visually
  - State: **"I'm clear, you're clear, all clear"**;
- Deliver shock when indicated
- Immediately following the shock, resume chest compressions
- Follow prompts of the AED unit

Foreign Body Airway Obstruction (adults and children)

Abdominal Thrusts

- Locate navel and place balled fist, thumb in, against stomach above navel
- Place other hand over fist
- Pull sharply inward and upward until obstruction is released
- If person becomes unconscious, begin CPR starting with compressions

Chest Thrusts

- Stand behind the person, encircling their chest, placing your arms directly under their armpits
- Form a fist and place the thumb side of your fist on the middle of breastbone (avoid the xiphoid process and the margins of the rib cage)
- Place other hand over fist and deliver 5 quick forceful thrusts until obstruction is released
- If the person becomes unconscious, begin CPR, starting with compressions

Back Blows

- Stand to the side and slightly behind the victim
- Support the chest with one hand and lean the victim forward
- Give up to five sharp blows between the shoulder blades with the heel of your hand
- Check to see if each back blow has relieved the airway obstruction
- If the person becomes unconscious, begin CPR, starting with compressions

A combination of techniques maybe needed to remove the obstruction.

Foreign Body Airway Obstruction (infants)

- Place the infant face down on your forearm, cupping their head with your hand
- Deliver five back blows between the shoulder blades
- Place other forearm over infant, creating a sandwich, and turn infant over, face up
- Deliver five chest thrusts as with CPR
- Alternate infant's position (face-down back blows/face-up chest thrusts) until object is released

Basic Life Support: First Aid Skills

Scene Safety Assessment

S	Stop
A	Assess the scene
F	Find oxygen unit, first aid kit and AED, and take to injured person
E	Exposure protection

Initial Assessment

- Assess responsiveness and normal breathing
  - Tap the person's collar bone or shoulder and loudly ask "Are you OK?"
  - State your name and your desire to help
- If the person responds, have them remain in the position found
- If unresponsive but breathing normally, place in recovery position
- If not breathing normally, begin CPR
  - Shout for help or send a specific person to call EMS

Secondary Assessment

- Use eyes and hands to check for abnormalities, bleeding or other body fluids
- Inspect person from head to foot palpating gently and visually checking:
  1. Scalp, face, nose and ears
  2. Neck and collarbones
  3. Ribs and abdomen
  4. Hips and legs
  5. Arms and grip strength
  6. Ability to wiggle fingers and toes
- Stop if any life-threatening injuries are found and intervene as necessary
- Note any abnormal findings

Bleeding

Direct Pressure

- Apply direct pressure to the wound until the bleeding is controlled
  - Apply dressing; use additional absorbent material if needed
- Bandage the dressing in place, wrapping toward the heart
  - Check for CMS (circulation, movement, sensation); adjust dressing and bandage if necessary
- Do not remove impaled objects; secure them in place to avoid further injury

Applying a tourniquet

- Apply 2.5-5 cm (1-2 inches) above the wound or high on the limb
- Place windlass over bleeding artery
- Turn windlass until bleeding stops, and secure
- Note "T" or "TK" and time of application on injured person's forehead
- Continue to monitor and provide verbal support

Wound Packing

- Pack dressing material to the depth of the wound
- Apply lateral pressure to the wound walls, holding gauze in place on one side while additional gauze is packed on the opposite side
- Maintain lateral pressure on wound walls during the packing process.
- Hemostatic impregnated gauze, if available, is a good choice for this type of wound
  - If it is used, advise EMS personnel. It will require modification in their care

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Basic Life Support: First Aid Skills

Splinting

- Apply splint to injured limb (splint in the position found)
- Immobilize joints above and below the injury
- Pad injured area to support and protect
- Use sling with arm splints
- Check for CMS (circulation, movement, sensation); adjust splint or sling if necessary

Shock

- Maintain normal body temperature (provide warmth/cooling as needed)
- Elevate the feet 15-30 cm (6-12 inches) if there is not a neck, spine, or pelvis injury
- Do not provide food or drink

Suctioning

For adults and children

- Place in recovery position if not already
- Use size-appropriate suction catheter
- Measure suction device
- Use scissor technique to open mouth
- Suction for no more than 15 seconds for adults and 10 seconds for children
- Monitor injured / ill person; repeat suction as necessary

For infants

- Depress suction bulb before suctioning
- Remove the suction bulb from mouth or nose, and depress it away from the infant to clear it
  - Suction the mouth and then the nose
  - Limit suctioning to no more than 5 seconds

Recovery Position

- Kneel beside the person, and make sure their legs are straight
- Place arm nearest you at a right angle to their body
- Bring far arm across their chest placing their hand against their cheek
- Hold their hand in place
- With your other hand, pull the far knee up by placing your hand under the leg just above the knee or grab that pant leg; keep the foot on the ground
- Pull the elevated knee toward you with one hand while supporting their hand that is against their cheek with your other hand; rolling them onto their side
- Adjust the top leg so 90° angles are formed at the hip and knee
- Adjust the head and hand if necessary to keep airway open
- Monitor the person for any changes

Medical Emergencies

The following are MEDICAL EMERGENCIES. Alert local emergency medical services immediately!

Anaphylatic Shock: Signs/Symptoms (swelling, itching, airway narrowing, respiratory distress)

- Assist with any prescribed allergy medications

Cardiogenic Shock: Signs/Symptoms (pale, clammy skin; severe shortness of breath; weak pulse)

- Have person lay on their back or in a position of comfort; monitor responsiveness

Hypovolemic Shock: Signs/Symptoms (pale, clammy skin; confusion; weakness; rapid breathing)

- Control any bleeding; lay person on back or in position of comfort; monitor responsiveness

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First Aid for Hazardous Marine Life Injuries (HMLI)

Scene Safety Assessment

S	Stop
A	Assess the scene
F	Find oxygen unit, first aid kit and AED, and take to injured person
E	Exposure protection

Initial Assessment

- Assess responsiveness and normal breathing
  - Tap the person's collar bone and loudly ask, **"Are you OK?"**
  - State your name and your desire to help
- If the individual responds, have him remain in the position found
- If the person is unresponsive but breathing normally and you do not suspect back or neck injury, place them in the recovery position
- If the person is not breathing normally, begin CPR
  - Shout for help, or send someone to call EMS

CPR (Do not delay CPR to wait on an AED or other equipment.)

- Deliver 30 compressions followed by two ventilations
- Continue CPR cycles of 30:2
- Deploy AED if available

Shock Management

- Place person on their back or in position of comfort
- Consider elevating legs 15-30 cm (6-12 inches) if no neck, spine, or pelvis injuries
- Maintain normal body temperature
- Monitor responsiveness continuously
- Do not give fluids

Stings (jellyfish, fire coral, anemones, hydroids)

Signs and Symptoms (Symptoms may progress rapidly.)

- Pain (can be extreme)
- Muscle cramps (may be severe)
- Welts
- Burning and itching
- Localized redness and swelling
- Blisters (formation may be delayed)
- Nausea, fatigue, general malaise
- Shock (rare)

First Aid (Call emergency medical services immediately if symptoms progress.)

1. Inactivate: Irrigate with generous amounts of white household vinegar
2. Wear gloves. Remove tentacles with tweezers
3. Wash/irrigate with seawater or sterile saline, avoid rubbing, and do not use fresh water
4. Treat the symptoms: Manage pain using hot or cold packs, pain medication, topical anesthetic agents and topical anti-inflammatory agents
5. Monitor for allergic reaction and/or infection
6. Treat for allergic reaction if necessary

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Product Code: 351-3480-1 v3 8-23

Emergency Oxygen for Scuba Diving Injuries (EO_2)

Scene Safety Assessment

S	Stop
A	Assess the scene
F	Find oxygen unit, first aid kit and AED, and take to injured person
E	Exposure protection

Initial Assessment

- Assess responsiveness and normal breathing
  - Tap the person's collar bone and loudly ask "Are you OK?"
  - State your name and desire to help.
- If the person responds, have them remain in the position found or position of comfort
- If unresponsive but breathing normally, place in recovery position
- If not breathing normally, begin CPR.
  - Shout for help or send a specific person to activate EMS

Steps to Initiate Oxygen Delivery

- Turn on the unit with one full turn
- Check the pressure gauge on the tank to ensure cylinder is full or has adequate gas supply
- Ask the injured diver for permission to assist:
  - "This is oxygen. It might help you feel better. May I help you?"
  - If the diver is unresponsive, consent is implied

Breathing Diver – Demand Valve

- Constant flow setting should be in the OFF position
- Place an oronasal mask on the demand valve
- Take a breath from the oronasal mask and exhale away from the mask
- Place the mask over the injured diver's mouth and nose
- Adjust the elastic strap if present to ensure a snug fit
  - Check for leaks
  - Instruct the injured diver to hold the mask
- Instruct the injured diver to breathe normally from the mask

Breathing Diver – Nonrebreather Mask

- Stretch oxygen tubing to remove kinks
- Attach tubing to constant flow outlet
- Set constant flow control at 10-15 lpm
- Prime mask reservoir bag
- Place mask over injured diver's mouth and nose
- Adjust nose clip and elastic strap to ensure a (snug) seal
- Adjust flow up or down to meet the needs of the injured diver
  - Adjust the flow up or down to maintain a reservoir volume of at least 1/3 full during inhalation
  - If flow has been increased to maximum lpm and bag still fully deflates, switch to demand valve

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Emergency Oxygen for **Scuba Diving Injuries** (EO_2)

Non-Breathing Diver – Bag Valve Mask (BVM)

First rescuer begins CPR.
Second rescuer prepares oxygen equipment, maintains airway and seal then monitors oxygen supply.

- Stretch tubing to remove kinks
- Connect tubing to constant flow outlet
- Set constant flow to 15 lpm; allow reservoir bag to fill
- Position mask over injured diver's mouth and nose
- Open airway using head tilt / chin lift, lifting jaw into mask and creating seal
- **First rescuer** ventilates injured diver by gently and slowly squeezing the bag about one-third of volume causing chest to rise
  – Deliver two ventilations for 1 second each
  – Watch for chest to rise and then fall between ventilations
- Continue CPR cycles of 30:2

If oxygen supply runs out, continue to ventilate using ambient air.

Non-Breathing Diver – Manually Triggered Ventilator (MTV)

First rescuer begins CPR.
Second rescuer prepares oxygen equipment, maintains airway and seal, then monitors oxygen supply.

- Check MTV safety valve to ensure proper function
  – Take a breath from the oronasal mask and exhale away from the mask
  – Press resuscitation button, block outlet – flow should stop and you should hear a click.
  – Do not use if it does not function properly
- Connect oronasal resuscitation mask to MTV
- Position mask over injured diver's mouth and nose, adjust elastic strap to ensure snug fit
- Open airway using head tilt / chin lift, lifting jaw into mask and creating seal
- **First rescuer** ventilates injured diver by pressing resuscitation button.
  – Deliver two ventilations for 1 second each
  – Watch for chest to rise and then fall between ventilations
- Continue CPR cycles of 30:2

If oxygen supply runs out, switch to another ventilation method.

General Guidelines

- Activate emergency assistance plan if not already initiated
- Monitor oxygen supply
- Monitor injured diver for changes in level of consciousness and signs of circulation
- Never leave injured diver alone

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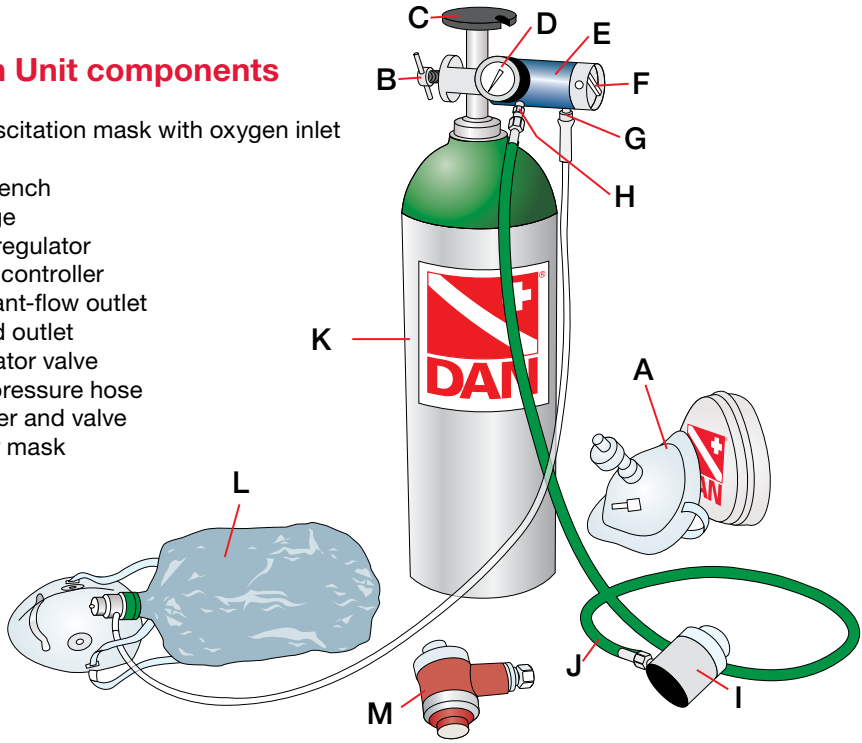
Oxygen Components

Delivery Device	Flow Rate	Inspired Fraction+
Oronasal mask (pocket mask)	10 lpm	≤ 0.5–0.6 (50%–60%)*
Nonrebreather mask	10-15 lpm	≤ 0.8 (80%)**
Bag valve mask	15 lpm	≤ 0.9–0.95 (90%–95%)
Demand valve / MTV	N/A	≤ 0.9–0.95 (90%–95%)

* May vary with respiratory rate
** Less variation with changes in respiratory rate
NOTE: Delivery fractions vary with the equipment and techniques used. This table summarizes various oxygen-delivery systems and potential values of inspired oxygen with their use.

DAN Oxygen Unit components

A. oronasal resuscitation mask with oxygen inlet
B. T-handle
C. handwheel wrench
D. pressure gauge
E. multifunction regulator
F. constant-flow controller
G. barbed constant-flow outlet
H. DISS threaded outlet
I. demand inhalator valve
J. intermediate pressure hose
K. oxygen cylinder and valve
L. nonrebreather mask
M. MTV



WARNING

Diving First Aid Equipment For Emergency Use By Properly Trained Persons Only
Misuse of this equipment may result in serious injury or death.
Contact DAN for information about oxygen training.

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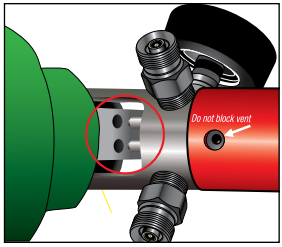
Oxygen Kit Assembly

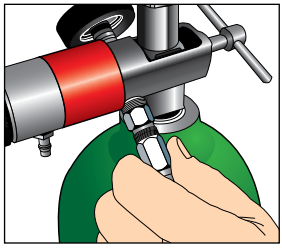
Oxygen Regulator

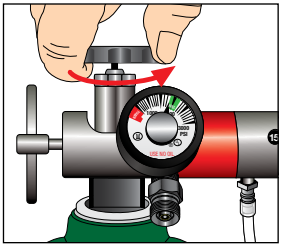
1. Place cylinder in upright position
2. Check for O_2 washer placement on regulator
3. Slide regulator down from the top of the valve and align the two pins to match holes on valve
4. Gently tighten T-handle until regulator is snug on valve



Demand Valve (DV), Manually Triggered Ventilator (MTV)

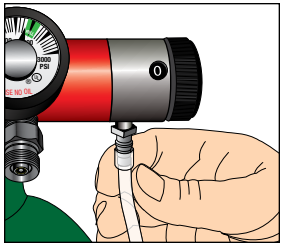
1. Attach hose to one of the DISS threaded outlets on the regulator finger tight
2. Attach demand or MTV valve to other end of hose also finger tight
3. Attach pocket mask to demand or MTV valve
4. Attach handwheel wrench to top of valve
5. Slowly open valve of O_2 cylinder and listen for gas leaks
   - If a gas leak is detected, turn off valve and check constant flow controller, hoses and O_2 washer
6. Slowly open valve one full turn
7. Test demand valve or MTV function by inhaling from mask and exhaling away from mask and over-pressure shut off on MTV – Ask injured person for consent
8. Place mask on injured diver's face and secure with elastic straps to maintain proper seal

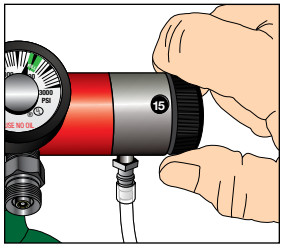




Bag Valve Mask (BVM), Nonrebreather Mask

1. Remove nonrebreather mask from packaging
2. Stretch out clear tubing
3. Attach end of oxygen tubing to barbed constant-flow outlet
4. Attach handwheel wrench to top of valve
5. Slowly open valve of oxygen cylinder and listen for gas leaks
   - If gas leaks are detected, turn off valve and check hoses and O_2 washer
6. Slowly open valve one full turn
7. Activate O_2 flow by turning the constant flow controller until it reads 10-15 lpm
8. Prime the reservoir bag by blocking the one-way valve until it is full – Ask injured person for consent
9. Place mask on the injured diver's face, secure with elastic straps and adjust nose clip to maintain proper seal
10. Adjust the flow up or down to maintain a reservoir volume of at least 1/3 full during inhalation





Note: All hose connections are hand-tightened; don't use a wrench.

Neurological Assessment (Neuro)

History

Date _____ Time _____

Injured Person's Name _____

Conduct F-A-S-T (check areas of abnormal findings)

❑ Facial Symmetry ❑ Arms ❑ Speech/Sudden Headache ❑ Time _____

(call EMS if any abnormal findings are present)

Complete S-A-M-P-L-E (note responses in spaces provided)

Signs and **S**ymptoms _____

Allergies _____

Medications _____

Pre-existing conditions _____

Last oral intake (what and time) _____

Events leading up to incident _____

For Divers:

Dives during previous 24 hours:

Last dive: Depth _____ Bottom Time _____ Breathing Gas _____

Surface interval _____

Previous dive: Depth _____ Bottom Time _____ Breathing Gas _____

Surface interval _____

Previous dive: Depth _____ Bottom Time _____ Breathing Gas _____

Surface interval _____

Previous dive: Depth _____ Bottom Time _____ Breathing Gas _____

Surface interval _____

Previous dive: Depth _____ Bottom Time _____ Breathing Gas _____

Unusual features of any dive _____

Diver used: ❑ Computer ❑ Dive Tables ❑ Other

Location of any pain _____

Does movement change level of pain? (check one) ❑ Yes ❑ No

Locate dive buddy (check one) ❑ Yes ❑ No

Notes: (attach dive buddy and/or witness comments) _____

Neurological Assessment (Neuro)

Vital Signs

Time _____ Pulse ____ Resp. _____ 2nd Time _____ Pulse ____ Resp. ____

Mental Function

Orientation (check erroneous answers):

❑ What is your name?

❑ Where are you?

❑ What is the day and time?

❑ Why are you here?

Ability to follow commands: ❑ Yes ❑ No
"Stick out your tongue and close your eyes."

Ability to repeat a simple phrase: ❑ Yes ❑ No
Ex.: "no ifs, ands, or buts"

Name three objects (able to complete): ❑ Yes ❑ No

Abstract reasoning (able to explain relationship): ❑ Yes ❑ No
Ex.: Student/Teacher Pencil/Paper

Calculations: count backward from 100 by 7s (circle misses):
93 86 79 72 65 58 51 44 37 30 23 16 9 2

Memory (able to recall the three items identified earlier): ❑ Yes ❑ No

Cranial Nerves

Eyes (circle any direction unable to look): Left Right Up Down

Facial Symmetry "Close your eyes and smile": ❑ Yes ❑ No

Hearing Symmetrical from about 30 cm (1 foot): ❑ Yes ❑ No

Motor Function

Scale (note in blank next to area): Normal (N) Weak (W) Paralyzed (P)

Upper Body	Shoulders	L ___	R ___	**Lower Body**	Hip Flexors	L ___	R ___
	Biceps	L ___	R ___		Quadriceps	L ___	R ___
	Triceps	L ___	R ___		Hamstrings	L ___	R ___
	Finger spread	L ___	R ___		Foot – up	L ___	R ___
	Grip Strength	L ___	R ___		Foot – down	L ___	R ___

Coordination and Balance

Able to complete:

Finger – Nose – Finger: Eyes open: ❑ Yes ❑ No Eyes closed: ❑ Yes ❑ No

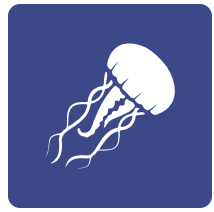
Walk: ❑ Normal ❑ Wobbly ❑ Unable Romberg: ❑ Yes ❑ No

Exam Repeated

Time _____ Comments _____

Time _____ Comments _____

First Aid for Hazardous Marine Life Injuries (HMLI)



Spiny Envenomations

(lionfish, stonefish, stingrays, seastars/urchins, crown-of-thorns)

Signs and Symptoms

- Puncture or laceration
- Pain (intense, sharp, stinging)
- Protruding spines and/or tissue damage
- Local swelling
- Blisters
- Purple or black skin discoloration (possibly)
- Nausea and vomiting
- Shock (rare)
- Respiratory arrest (rare)
- Cardiac arrest (rare)

First Aid

1. Thoroughly wash area
2. Remove foreign material with tweezers. (Leave stingray spines in place for removal at medical facility)
3. Control any bleeding
4. Manage pain by immersing in hot (nonscalding) fresh water (45˚C / 112˚F maximum) for 30-90 minutes (Cold packs may also be used)
5. Leave blisters intact
6. Apply topical antibiotic ointment
7. Monitor responsiveness
8. Seek medical evaluation
9. Use antivenin for stonefish, if indicated
10. Monitor for allergic reaction and/or infection

Contact Injuries

(sponges, corals, bristle worms)

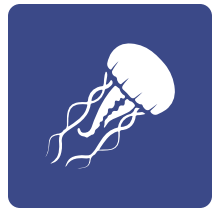
Signs and Symptoms

- Sharp, stinging pain
- Localized redness
- Mild to severe itching
- Swelling
- Burning sensation, numbness
- Blisters
- Bleeding associated with cuts/scrapes

First Aid

1. Wash with soap and water
2. Remove foreign material
   a. Cellophane tape may help with bristle removal
   b. Irrigate to dislodge debris
3. Control any bleeding
4. Leave blisters intact
5. Eye contact: Flush with fresh water and seek medical attention
6. Monitor for infection

First Aid for Hazardous Marine Life Injuries (HMLI)



Pressure Immobilization Technique
(sea snake and blue-ringed octopus bites, cone shell envenomations)

Signs and Symptoms
Symptoms may progress rapidly and vary with type of injury.

- Immediate pain
- Mild swelling and / or redness
- Numbness / changes in sensation
- Confusion
- Progressive weakness
- Bleeding associated with cuts / scrapes

First Aid
1. Keep injured person still
2. Wash with soap and water
3. Remove foreign material if present
4. Apply dressing over bite
5. Apply elastic bandage snugly but not excessively tight over the site
   - Wrap at least 15 cm (6 inches) on either side of the wound if possible
6. Check for adequate circulation/pulse at fingers/toes (capillary refill)
7. Splint affected extremity
8. Use a sling when the wound is on the hand or arm
9. Do not remove until at a medical facility
10. Call EMS or transport immediately

(use of a cold pack may slow localized blood flow and spread of venom)

Traumatic Injuries
(control of external bleeding)

Signs and Symptoms
- Bites (teeth in wound)
- Severe scrapes

First Aid
1. Wash with soap and water
2. Control bleeding with direct pressure
3. Apply dressing and bandage
4. Seek medical evaluation
5. Monitor for signs of infection

Applying a Tourniquet
(if bleeding is profuse and uncontrolled by direct pressure)

1. Apply 2.5-5 cm (1-2 inches) above the wound
   - Or high and tight on the affected limb
2. Place windlass over the path of the artery
3. Turn windlass until bleeding stops, and secure in place
4. Note “T” or “TK” on injured person’s forehead
5. Continue to monitor and provide verbal support

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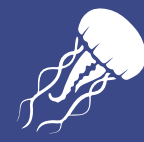
First Aid for Hazardous Marine Life Injuries (HMLI)



Life-Threatening Complications

Shock

The following are MEDICAL EMERGENCIES. Call local emergency medical services immediately!

Anaphylatic Shock: Signs/Symptoms (swelling, itching, airway narrowing, respiratory distress)

- Assist with any prescribed allergy medications.

Cardiogenic Shock: Signs/Symptoms (pale, clammy skin; severe shortness of breath; weak pulse)

- Have person lay on their back or in a position of comfort; monitor responsiveness

Hypovolemic Shock: Signs/Symptoms (pale, clammy skin; confusion; weakness; rapid breathing)

- Control any bleeding; lay person on back or in position of comfort; monitor responsiveness.

Seafood Poisoning

Symptoms may progress rapidly with tetrodotoxin (TTX) poisoning.

Call emergency medical services immediately if neurological symptoms appear.

Signs and Symptoms

- Abdominal pain, gastroenteritis
- Nausea, vomiting
- Diarrhea
- Numbness, tingling
- Itching
- Lack of muscle coordination
- Paralysis
- Reversal of hot and cold perception

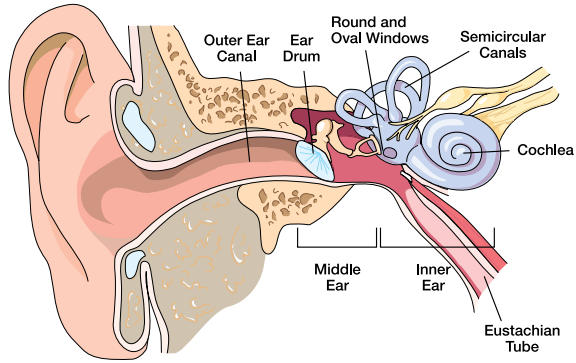
First Aid

1. Monitor responsiveness.
2. Treat for anaphylatic shock if necessary.
3. Contact the local poison control center. Save fish or vomitus for analysis if available.
4. Seek evaluation from a medical professional when seafood poisoning is suspected.

Notes: _____

Divers Guide to The Ear and Sinuses

Middle-Ear Barotrauma



- This is the result of impaired or incomplete equalization of the middle ears
- It can occur during descent (“squeeze”) or ascent (“reverse block”)
- It may or may not involve ear-drum perforation
- Contributing factors include a recent cold, allergy symptoms, congestion/ runny nose
- Symptoms include a feeling of ear fullness, sensation of water or fluid in the ear, muffled hearing, ear pain or crackling sounds
- Do not use ear drops (the problem is behind the ear drum)
- Seek medical evaluation to rule out more severe injury and prevent infection

Prevention

- Avoid diving when congested
- During a descent, do not dive past the point of pressure or discomfort—ascend a few feet and try again
- Abort the dive if pressure is not relieved
- Stop ascent if you feel pressure or discomfort to facilitate equalization and avoid holding your breath

Inner-Ear Barotrauma versus Inner-Ear Decompression Sickness

- Inner-ear barotrauma can be the result of impaired or incomplete equalization or a forceful equalization
- Inner-ear DCS is a manifestation of gas bubbles in the inner ear
- Symptoms of both conditions often include vertigo, tinnitus, hearing loss, nausea and vomiting
- Provide oxygen, and transport the patient to the nearest emergency room
- Evaluation by an ENT specialist and/or hyperbaric physician is generally required
- Inner-ear DCS will require prompt hyperbaric chamber treatment. Inner-ear barotrauma is a contraindication for hyperbaric treatment

Three Tips To Protect Your Ears

1. Never dive when congested.
2. Don’t descend unless you have relieved ear discomfort with equalization.
3. If you frequently have difficulty with equalization, visit an ENT specialist.

DAN Video on Ears and Sinuses

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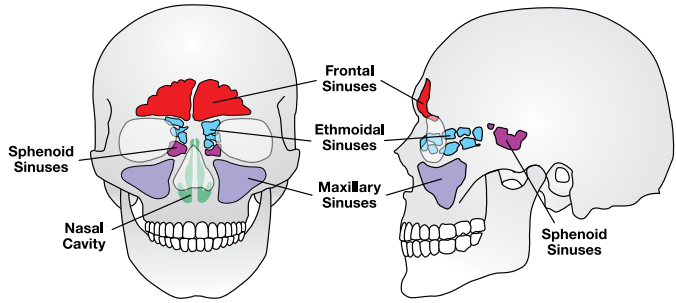
Divers Guide to The Ear and Sinuses

Sinus Barotrauma



- It is the result of impaired or incomplete equalization of the sinuses
- It can occur during descent (“squeeze”) or ascent (“reverse block”)
- Contributing factors include recent cold, allergy symptoms, congestion/ runny nose
- Primary symptoms are facial pain, especially in the forehead, eye, cheek, upper teeth or at the back of the head
- Blood from the nose or mouth is common
- Seek medical evaluation to rule out more severe injury and prevent infection

Prevention

- Avoid diving when congested
- Abort the dive if you develop sinus pain during the descent
- If you develop sinus pain or discomfort during ascent, stop. Remain at a comfortable depth and wait briefly. Do not hold your breath or blow your nose. Allow equalization to occur naturally while you ascend slowly.

Alternobaric Vertigo / Caloric Vertigo

- Alternobaric vertigo results from differential equalization of the two middle-ear spaces
  - Can occur during ascent or descent, and resolves when pressure equalizes
- Caloric vertigo is a result of the eardrums being exposed to unequal water temperatures
  - Typically results when colder water enters one ear canal

Otitis Externa (“Swimmer’s Ear”)

- This is an infection of the ear canal
- Symptoms include pain that may worsen with tugging the outer ear, tenderness and itching
  - Do not use ear drops unless prescribed by a physician
- Seek medical evaluation if symptoms last more than a day
- Otitis externa can often be prevented by rinsing the ears with clean, fresh water and carefully drying them after every dive
  - Use 1 or 2 drops of a 50/50 solution of white vinegar and rubbing alcohol after every dive for prevention or other drops per doctor’s recommendation
  - Refer to an ENT for chronic conditions