Snorkel Guidelines – information for participants

EMR Snorkel information

The Experiencing Marine Reserves (EMR) programme is exactly what the name implies. It is about experiencing, first hand, the difference between local beaches and fully protected marine reserve areas. Snorkelling enables an insight into the marine world. Even standing in waist deep water looking about with a mask on is an experience!

EMR Snorkelling Objectives:

- Experience marine life first hand
- Build water safety & confidence in the real environment
- Encourage snorkelling as a recreational and fun activity
- Instil caring attitudes and passion for the conservation of the ocean
- Encourage emotional connection to marine environment

Outline

The first part of the EMR programme is learning about the marine environment in the classroom (dependant on extent of EMR programme participation). If possible, it is encouraged to practice snorkelling in the school pool with an EMR snorkel leader/coordinator, confident teacher or New Zealand Underwater Minidippers trainer.

The third stage is an introductory snorkel in shallow water at the local beach (dependant on extent of EMR programme participation). Your EMR coordinator will have already snorkelled at your local beach (or have previous experiences or confidence in the area) and will have identified any hazards or risks.

After your local investigation or snorkel, you will then experience a marine reserve (dependant on extent of EMR programme participation).

The EMR Team

EMR is delivered by a team of passionate coordinators nationwide. EMR coordinators/snorkel leaders offer guidance, direction and coordination of classroom exercises and field trips to the ocean. We also provide snorkel equipment, instruction, resources and snorkel risk management.

To find out more about our team of regional coordinators visit our website http://www.emr.org.nz

Health and Safety

Experiencing Marine Reserves (EMR) is a programme of the Mountains to Sea Conservation Trust. We are a registered adventure activity. Regulation 6(1) of the Health and Safety at Work Act (Adventure Activities) Regulations 2016 (the Regulations). For confirmation of our registration go to www.worksafe.govt.nz

TRAINING THE SNORKS

Some background information for snorkellers

Equipment

Wetsuits are essential for your safety and warmth. Please take care when fitting wetsuits, and ease the suit on – do not pull. Your mask should feel comfortable and water-tight. A good test is to place the mask on your face (without straps) and inhale gently through your nose. If the mask fits well it will cling to your face.

Your snorkel allows you to breathe while you are swimming on top of the water. A mask places a layer of air between your eyes and the water and allows you to see clearly. When using a mask objects appear to be larger and closer.

Snorkels have a soft mouthpiece with tags called spigots for you to grip with your teeth while breathing. The fins help us to propel ourselves through the water. Never walk with your fins on land, as this is a recipe for disaster. Remember to use de-fog rather than spit (unless it is your own mask) to stop your mask fogging up before entering the water.

Toothpaste should be used to clean off chemical residue on new masks before use. Your own gear should be maintained by rinsing in freshwater after use. For EMR gear refer to the EMR gear care and sanitisation policy on our website http://www.emr.org.nz

Body boards are used by EMR as buoyancy aids and for additional visibility. There should be 1 body board per buddy group. Staff running any activity have the authority to cease an activity for any safety reason.

Sound

Sound travels much faster underwater than on land (4 times faster), and this increased speed makes the direction of the sound difficult to determine. This means that the snorkeler must be very aware of boats. Use of a dive flag helps your buddy group to be visible to boats.

Movement

The best way to move through the water while snorkelling is to float face-down while breathing through your snorkel. Fin kicks should be slow, steady and even. Try not to thrash around, as you may scare the fish! Your hands are best by your side to conserve energy.

Temperature

An hour in the water is like a day in air of the same temperature! As we lose heat much faster in the water, it is very important to get out of the water if you begin to shiver.

Communication – hand signals!

OK on Surface or from distance

OK (checking your buddy)

Distress Signal

Going Down

Going Up

Buoyancy

When objects are placed in the water, they will usually sink or float. When a snorkeler is placed in water, the snorkeler will displace a volume of water equal to the volume of the person immersed. The upthrust is the force pushing us up. When the upthrust is greater than the mass of the object it will float and be positively buoyant (e.g., a wetsuit makes more volume and displaces more water).

When equal to the mass of the object, it will just float on the surface and will have neutral buoyancy (e.g., when a snorkel diver has no wetsuit). When less than the weight of the object, the snorkeler is said to have negative buoyancy and sinks (e.g. a snorkeler with no wetsuit and a weight belt).

When we wear a wetsuit, it makes us positively buoyant. Weight belts can be used to counter this effect (e.g., you put on a wetsuit in air on the surface and weigh 61 kg and when immersed in water you displace 64 litres of water, the volume and the mass of water displaced (upthrust) would be 64kg, so the snorkeler would float.

To counter this we add 3 kg of weight to make up the difference in air (61kg) and water (64kg), this would theoretically make the snorkeler neutrally buoyant. By using a wetsuit with a weight belt snorkelers are able to stay warm whilst enabling diving underwater to look around.

Wetsuits also protect us from abrasions and the sun. We aim to have neutral or slightly positive buoyancy so we can stay on the surface with minimal energy while also allowing you to snorkel dive easily. When buoyancy is neutral, the diver should float on the surface when the lungs are full of air, then slowly sink as they exhale. We must always check ourselves for neutral buoyancy upon entering the water and adjust our weight belt accordingly.

If you notice a diver struggling to reach the surface, the first thing to do is remove their weight belt.

When teaching students or novices, we must ensure they are positively buoyant so they will tend to float rather than sink, making them much safer. We do this by getting them to wear a wetsuit but NO weight belt, unless specific training is delivered in the pool prior to open water for year 8's and below or if the weight belt belongs to the student and they are supervised by their parent

Buddy System

When snorkelling, we must always go with a buddy. The EMR programme recommends a ratio of 1:2 (one adult supervisor to two students) for year 8's and below. You must stay one arm's length from your student and adult buddies. In your buddy group, your adult supervisor will have a buoyancy device (body board), this allows you to hang over the front and get used to seeing and breathing through your mask and snorkel. The body board can be used for resting on or holding on to keep your group together. The use of body boards also makes EMR buddy groups identifiable. Refer to EMR SOP for snorkelling

Snorkel Diving

Indicate to your buddy that you are going down using the signals, take a deep breath, duck dive underwater (head first), kick your legs into the air and use your legs and body weight to force you down. Equalise on your way down and point your hand up on return on the way up to avoid collisions.

The best way to clear your snorkel is to use the blast method when you reach the surface. To do this you must hold your tongue over the mouthpiece while duck diving and then take your tongue out of the mouthpiece and blow! Always take a cautious breath after clearing your snorkel, in case you did not clear all the water.

If you have water in your mask this can be cleared without taking it off. By using the top of the mask as a hinge and the bottom as a door, tilt your head back and open the door to let water out while exhaling at the same time.

Buddy Cooperation

When snorkelling with your buddy, it is important for you to watch out for each other. While one duck dives down the other keeps watch from the surface and vice versa. This is called the 'one up one down' rule.

Practise your going down hand signal with each other. Make sure you stay together - within one arm's length. Inform your adult buddy if one of you is getting cold. If one person needs to go back to the beach, then the whole buddy group must go back. Never snorkel alone!

TREATMENT OF INCIDENTS IN RELATION TO SNORKEL DIVING

All EMR coordinators are qualified First Aiders. The most recent information from First Aid trainers should apply to the information below.

Priority action plans include SRABCS – Safety, Response, Airway, Breathing, Circulation, and Severe Bleeding.

Pressure related injuries or Barotraumas

When diving down under the water the pressure increases, which in turn increase pressure on the ear drum. Air in the middle ear is trapped and can expand and contract inside the ear, causing pain in your ear drum. Therefore, we must 'equalise' the pressure. You can equalise by pinching your nose and gently blowing. Pressure can also cause a face mask 'squeeze'. Blowing gently into your mask will also equalise the air space between your eyes and the water. Never snorkel with swim goggles, as these cannot be equalised and can cause serious damage to your eyes.

Equalisation can also be achieved by swallowing or wriggling your jaw or moving your neck. Tilting the head back, yawning and moving the jaw around may also help as it will open the Eustachian tube more making equalizing easier. Chewing menthol gum before a dive can help as it also opens the Eustachian tube.

If pain persists when you dive down, then you should stay on the surface of the water. It is also important not to dive under if you have a cold, as this blocks the ear and makes equalisation difficult. Always equalise on your way down gently – never blow hard and do not equalise on your way back up.
First aid treatment for barotraumas involves keeping passages unblocked. If ear bleeding occurs, lay patient down, cover the ears (but do not plug), help the patient to relax and call for medical assistance.

Allergies

Mild to moderate: Swelling of lips, face, eyes. Hives or welts, tingling mouth abdominal pain or vomiting Last two are signs of anaphylaxis for insect allergy)
Action for mild to moderate allergic reaction: For insect allergy, flick out sting if visible
Stay with person and call for help. Give other medications (if prescribed), Phone family or emergency contact

Anaphylaxis

Watch for any one of the following signs of anaphylaxis (Severe allergic reaction)

- Difficult/noisy breathing
- Swelling of tongue
- Swelling/tightness in throat
- Wheeze or persistent cough
- Difficulty talking and /or in hoarse voice
- Persistent dizziness or collapse
- Pale and floppy (young children)

ACTION FOR ANAPHYLAXIS

1 Lay person flat - do NOT allow them to stand or walk

- If unconscious, place in recovery position
- If breathing is difficult allow them to sit

2 Give adrenaline (epinephrine) autoinjector if available

3 Phone ambulance - 000 (AU) or 111 (NZ)

4 Phone family/emergency contact

5 Transfer person to hospital for at least 4 hours of observation

If in doubt give adrenaline autoinjector

Commence CPR at any time if person is unresponsive and not breathing normally

ALWAYS give adrenaline autoinjector FIRST if available, and then asthma reliever puffer if someone with known asthma and allergy to food, insects or medication has **SUDDEN BREATHING DIFFICULTY** (including wheeze, persistent cough or hoarse voice) even if there are no skin symptoms [1]

Hypothermia

Hypothermia results when the core body temperature drops to a level it cannot recover from (below 35°C). If exposed for an extended period, cold water temperatures can cause hypothermia while snorkelling.

Symptoms include: intense shivering, numbness, slurring of words, loss of coordination, stumbling, clumsiness and changes in behaviour – anxious, irritable, and irrational. While snorkelling, the chances of hypothermia are much reduced by wearing a suitable wetsuit for the water temperature. Typically 7% of our body heat is released from the head, a hood can increase time spent in the water. On land sufficient warm clothes should be worn.
If a person starts to feel cold or begins to shiver, they should exit the water immediately. Later more serious signs are when shivering stops and unconsciousness occurs. When the body drops below 26°C death occurs.

To treat hypothermia move patient to a dry, sheltered area and change them out of wet clothing into warm, dry clothes. Give victim warm sweet liquids to drink if they can (not tea, coffee or alcohol). Avoid warming too quickly, swaddle the patients head. Keep the person lying down and warm with blankets. If symptoms persist and patient shivering decreases or stops, contact emergency services. Severe hypothermia is a medical emergency. Monitor vital signs, CPR may be required. SRABCS – Safety, Response, Airway, Breathing, Circulation, Severe Bleeding.
Note: The 1-10-1 rule for hypothermia. I have found many people believe exercise warms the body up. This is the last thing they should be doing. Knowing this will help snorkel guides make correct assessments when they are actually in the water. This rule is for sudden immersion in cold water but I think it is relevant to us, as hypothermia can set in without anyone realising until the situation becomes a problem.
https://nationalwatersafetycongress.wildapricot.org/1-10-1

[1] Allergic Reactions Action Plan, Australian Society of clinical immunology and allergy, www.allergy.org.au

Hyperthermia

Hyperthermia is the opposite of hypothermia and results when the body produces or absorbs more heat than it dissipates. It is caused by excessive exposure to heat. Body temperatures above 40°C can be life threatening and while serious hyperthermia can come on quickly, it usually follows a period of heat exhaustion.

Symptoms of hyperthermia initially include sweating profusely but serious hyperthermia occurs when the body is no longer able to sweat due to dehydration. Patients with hyperthermia often become confused or hostile and experience headaches. Blood pressure often drops which can lead to dizziness and fainting.

In serious cases, patients may encounter chills and trembling and children may suffer convulsions. Hyperthermia can be prevented by drinking plenty of liquids and keeping out of direct sunlight during the hottest parts of the day. Wetsuits should only be worn just before you enter the water, not for extended periods of time on land.

SRABCS – Safety, Response, Airway, Breathing, Circulation, Severe Bleeding.

Treatment for hyperthermia revolves around lowering the body temperature and rehydrating the patient. Moving the victim to a cool place and removing clothing can help, but in serious cases immersing the patient in cold water is necessary. Once in a cool area, place the victim in the recovery position and contact emergency services.

Hyperventilation and shallow water blackout

Hyperventilation is sometimes used during breath-hold diving to expel carbon dioxide from the body, reducing the urge to breathe and allowing a diver to stay underwater for longer periods of time. This method is dangerous and can cause shallow water black out where a diver loses consciousness when the body does not get enough oxygen. Shallow water blackouts are avoided by not hyperventilating and allowing the body to accurately signal the need to breath. Relaxing at the surface and breathing constantly also reduces the chances of shallow water blackouts. You should always take turns at diving under so if your buddy blacks out you will see this happen.

Unconscious snorkeler

Notify your snorkel leader. Respond by bringing diver back to the surface (if required), achieving positive buoyancy the diver (by dropping weights if wearing a belt and using buoyancy device). In-water resuscitation may improve survival of victims who are in the initial stages of the drowning sequence but delays time to full assessment and CPR.

Remove the victim from the water as soon as possible, and only begin in water rescue breathing if immediate removal from the water is delayed or impossible. Rescue breathing in deep water requires an appropriately trained rescuer and floatation aid such as a rescue board, tube or buoyancy vest. In water, chest compressions are ineffective and should not be attempted.

If consciousness not returned, once on shore, remove the diver from the water, follow **DRSABCD** **D**angers? **R**esponsive? **S**end for help Open **A**irway Normal **B**reathing? Start **CPR** Attach **D**ebibrillator (AED) as soon as available, follow prompts Continue CPR until responsiveness or normal breathing return

Any immersion event that is not symptomatic needs monitoring while in EMR duty of care and subsequent responsible persons advised to seek medical assessment.

Rescue tow techniques are covered in initial training of all coordinators as part of snorkel instructor training and at annual Mountains to Sea Wānanga conference and/or as part of EMR training courses.

Drowning

Drowning occurs when water enters the lungs. If someone has nearly drowned, it is likely they will be struggling to breathe if breathing hasn't already stopped. They may be frothing at the mouth and show little or no response. Make sure buoyancy is achieved and remove the patient from the water as soon as possible, and only begin in water rescue breathing if immediate removal from the water is delayed or impossible (as explained above).
Check for dangers to yourself and bystanders. Check RESPONSE using voice and touch. If there is no response, call 111 and ask for AMBULANCE. Check airway: tilt head back and lift the chin. Check breathing: look for normal breathing. If not breathing normally, commence CPR. Place one hand in the centre of the chest. Give 30 chest compressions: HARD and FAST then give two breaths. Continue until ambulance arrives. Attach AED (defibrillator) if available. Always remember 30 to 2 no matter who!

If patient conscious, keep them sitting up (on their side may also be appropriate) warm and reassured. A drowning casualty must be seen by a doctor as they may have water in their lungs. Call 111, for anyone with pale/bluish skin, especially around mouth, a persistent cough, shortness of breath, increased work of breathing, agitation or altered level of consciousness. Refer to ANZCOR Drowning Guideline

Note: Any immersion event that is not symptomatic needs monitoring while in EMR duty of care and subsequent responsible persons advised to seek medical assessment.

Minor aquatic injuries

Cuts and abrasions are common in a marine environment where there are many sharp rocks and marine life. Most minor aquatic injuries can be treated with your first aid kit for bumps, scrapes and stings. To treat a minor injury, get patient safely out of the water. Keep the person warm and comfortable and monitor their condition.
Flush wound with fresh water or saline and cover with a sterile dressing. Kina spikes are often difficult to remove use a splinter probe and tweezers. If there is any doubt about the persons condition, seek medical assistance.

Marine Life

Sharks-Some sharks may exhibit lack of fear and may approach snorkellers out of curiosity. Snorkel groups should stay close together at all times and within 1 arms length of buddy group. If snorkelling in known shark territory (e.g.: Galapagos sharks in the Kermadec Islands) a minimum of 1 push stick per group is to be carried. If aggressive shark behaviour displayed (watch for back arching and dropping of the pectoral fin, rapid movements towards snorkellers or build up of shark numbers throughout snorkel)- 3 whistle blasts to evacuate snorkel to nearest safe landing point. Try not to get in between the shark and the reef, avoid getting in tight gullies. Someone who experiences panic should be evacuated with buddy group. Avoid splashing. If anyone is cut they should abort with buddy group. If an Oceanic white tip, tiger shark, Mako or great white shark were sighted the snorkel should be aborted

Jellyfish-The most common jelly stings you may come across are those of the blue bottle and lion's mane. Although not fatal in most cases, the sting causes severe pain and welts on the skin. Treatment should include warm water and application of a neutralising cream (stingose) for the blue bottle and cold packs are advised for the sting of a lions mane jelly.

Rays-The sting of the sting ray are found on the tail. They may be multiple and up to 30cm in length. In response to being disturbed, the sting is driven with the point usually travelling forward and upward. The sting is made of cartilage, as is the skeleton of the stingray. It has a barbed/serrated surface which is covered in a tissue-necrotic toxin in a mucous sheath. The sting can cause massive local trauma, while the toxin results in local necrosis and a great dealo f pain. Initial treatment of a wound should include stabilisation of any respiratory or cardiovascular compromise and local measures to reduce major blood loss (pressure, tourniquet) visible loose spine fragments should be removed from wounds immediately and the wound irrigated with saline. Placing the affected part in hot water as hot as can be tolerated (40-45 degrees C) for up to 45 minutes should be attempted. Pain relief may be rapid but is likely to be temporary if not heat treated for more than 30 minutes. Any large objects embedded in the skin such as a stingray barb or stake should be treated for bleeding, but left in place for medical professional to remove.

Scorpion fish-Dorsal spines can administer a very painful sting. Should be treated the same as rays, with heat.[2]

Shock

Symptoms include-pale appearance, cold clammy skin, altered breathing (rapid and shallow), rapid weak pulse, faintness, nausea/vomiting, shaking and trembling.
Treatment- Call 111. Monitor the causalities breathing and pulse regularly. If the casualty becomes unconscious place them in a lateral position. Reassure the causality, and raise leg about the level of the heart and keep warm. *Give nothing by mouth, you can moisten the lips but do not give any food or drink.*

Bleeding

Try at all times to wear gloves or avoid contact with blood.
Severe bleeding-apply pressure, using a towel or anything to stop bleeding. Elevate the bleeding area. Rest the patient and treat for shock
Bleeding from nose-Ask patient to sit up, lean slightly forwards and pinch nostrils for 10 minutes breathing through mouth. Advise patient not to sniff or blow nose. If persisting seek medical advice
Bleeding from lacerations-Control bleeding by pressure, elevation and rest. Clear the area of skin around the laceration and apply sterile dressing. Those with broken skin should check their tetanus injection records. Superficial foreign matter should be removed but anything deep should be left for a doctor. Large cuts may require stitching (medical assistance)

Cramps

A cramp is a painful muscle contraction often caused by cold temperatures or physical exertion. The affected muscle can be stretched and massaged to relieve the pain; your buddy may be able to help with this. You may require assistance getting back to shore (notify your snorkel instructor).

A good calf muscle stretch is to pull the end of your fin towards you gently while massaging the muscle with your other hand. Once on shore, drink plenty of water as dehydration is one of the main causes of cramps. Drinking water before swimming and stretching muscles first can prevent cramps.

Exhaustion

[2] Bites and Stings, Stephen Adams, Journal of Accident and medical Practitioners Association (JAMPA) 2007;Vol. 4 (No.1)

Exhaustion often occurs due to excessive loss of body fluids and body salts. The person may suffer from headaches, dizziness, rapid breathing, feeling sick, muscle cramps, tiredness and restlessness. Assist the patient out of the water using a flotation device. Get patient warm and dry but keep them out of direct sunlight. Give patient energy food and liquid and allow them to rest until they recover. If condition doesn't improve, seek medical assistance
Information for treatment of snorkel incidents compiled by Samara Nicholas and EMR regional coordinators.

Last Advice

Before entering the water – remember:
LOOK – be aware of the environment around you
LISTEN – for instructions and any emergencies
FEEL – if you are getting cold

Remember 'Tiakina Tangaroa'
(Care for the Ocean and Seas)

Karakia

Whakamana te maunga
Whakamana te wai
He mauri o nga tangata
Nga mea katoa he pai
Hui ee
Tāiki ee

If we look after the water from the mountains to sea, it will look after us. It is our life force.