



from **John Lippmann**
OAM

A Year for Ears!

DAN AP sees a rise in cases of severe ear problems

One of the first skills divers learn is how to “equalise” their ears. Failure to adequately equalise the ears results in ear barotrauma (pressure injury). This is often apparent by a feeling of pressure, soon followed by pain, during descent (or sometimes ascent).

The most common and usually the most effective method of equalising involves the diver holding his/her nose and blowing gently. This is known as the “Valsalva Manoeuvre”. Although this method is very effective, damage can occur if it is done too vigorously. Overly-forceful equalisation should be avoided. Other methods include swallowing (with or without the nose blocked), wriggling the jaw, squeezing the tongue against the soft palate, or a combination of these. Divers need to ensure that whatever technique they use is effective in preventing pressure build-up.

If the pressure is not equalised, swelling and bleeding of the lining within the ear will occur, which helps to equalise the pressures and relieve the pain, although this can often lead to infection. In some cases the eardrum can rupture and, in very severe cases, delicate membranes within the inner ear can tear, enabling fluid to leak from the inner ear and creating the potential to damage this delicate organ, possibly affecting hearing and balance.

Bubbles from decompression can also form in or around the inner ear and so disrupt its function - inner ear decompression illness. In addition, a variety of other non-diving-related conditions affecting the ear can cause symptoms in divers during or after a dive.

Signs and symptoms associated with inner ear dysfunction may include hearing loss, vertigo (spinning), dizziness, ringing or other ear sounds (tinnitus), nausea and vomiting.

Any diver with these signs or symptoms after diving should promptly call a DAN-supported diving emergency hotline for advice. The doctor or medic will take a thorough history including the dive profile, the mode of equalisation and any equalisation issues, and the time of onset and progression of symptoms. A suitable course of action will then be determined.

An inner ear barotrauma or decompression illness needs to be managed swiftly and appropriately to minimise the potential for permanent injury.

Although ear injuries very commonly result from diving, especially with novices, historically, DAN AP has had relatively few Members who sustained severe ear injuries. However, this appears to be changing and over recent years, we are receiving an increasing number of reports of divers with serious ear injuries. Following are examples of some very recent cases:

Case 1: This 51-year-old male is a divemaster with a history of around 500 dives. He conducted a single 22m dive during which he had no noticeable equalisation problems, although at one point he mentioned pushing a finger under his hood to allow water entry. On surfacing and removing his hood he noticed an echo in one ear, muffled hearing, a buzzing noise, and very slight dizziness. He went to a general doctor several hours later and was given decongestants. Still rightly concerned, he consulted a specialist two days later and various tests were conducted. However, by the time the diagnosis of inner ear barotrauma (IEBT) was made, he sustained permanent severe hearing loss and tinnitus in the affected ear.

Case 2: A 34-year-old technical diver had completed two deco dives and surfaced with “a feeling of fullness in his ears and sinuses”. Back on the boat when later he forcefully equalised his ears (Valsalva), he heard a loud popping and felt sudden dizziness and complete hearing loss in one ear. Believing this not to be serious, he did not call DAN and remained on the boat for the next 3 days, not diving but with persistent hearing loss and dizziness. On returning to Singapore, he contacted DAN and was directed to a nearby hospital with an Ear Nose and Throat Specialist. A diagnosis of IEBT was made and he remained in hospital for week. However, the damage was irreversible and he was left with permanent hearing loss and ringing (tinnitus) in one ear.

Case 3: While on a diving vacation in the Solomons, this 51-year-old diver with a history of more than 3000 dives noticed a full feeling in one ear, dizziness and hearing loss while boarding the boat after the second of two 50-60m decompression stop dives. He reported that he had no equalisation difficulties. Believing that he had an ear infection, he self-medicated with antibiotics and did another three dives. After flying home, he contacted DAN some 5 days after the injury and was referred to an ENT specialist after discussion with a hyperbaric doctor. He was diagnosed with IEBT. By this time, irreversible damage was done and he is left with profound hearing loss and tinnitus in one ear.

Case 4: This diver had done 30 dives over two weeks in Indonesia to a maximum depth of 23m. Despite suffering severe diarrhoea, he decided to continue diving, although likely to still be dehydrated. On the final day he did 3 dives with no reported equalisation or other

problems. However, about 1.5 hours after surfacing, and while having a hot shower, he suddenly suffered severe vertigo (spinning), accompanied by nausea and vomiting. He was taken to the local navy chamber and he was already inside and receiving treatment by the time DAN was called. The chamber was small and it was very hot inside and he continued to vomit continuously. He became very distressed and later said that he thought he was going to die in there. DAN arranged to evacuate him to Singapore where he was diagnosed with inner ear decompression illness and received several more recompression treatments. Fortunately, his symptoms improved greatly.

The above cases highlight the importance of seeking specialist diving medical advice as soon as symptoms develop. Although it can sometimes be very difficult to differentiate between inner ear barotrauma, decompression illness,

and certain other disorders, a specialist can make a provisional diagnosis and advise the best course of action based on the likely problems and the severity of the symptoms. Sometimes permanent injury may be unavoidable but on other occasions, quick action can minimise the likelihood of permanent hearing or balance problems.

Well, here we are again at the end of another very busy but successful year for DAN AP. Despite tough economic times, we have seen some good membership growth, we have helped an increasing number of DAN Members and other divers at their time of need, trained more divers in accident prevention and management and completed several important research projects and commenced others.

The management and staff at DAN AP wish you a happy and safe festive season and look forward to serving you in 2012.

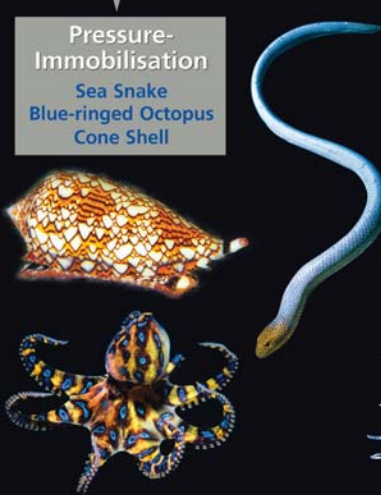


Venomous Marine Creatures

Venomous Bite or Sting

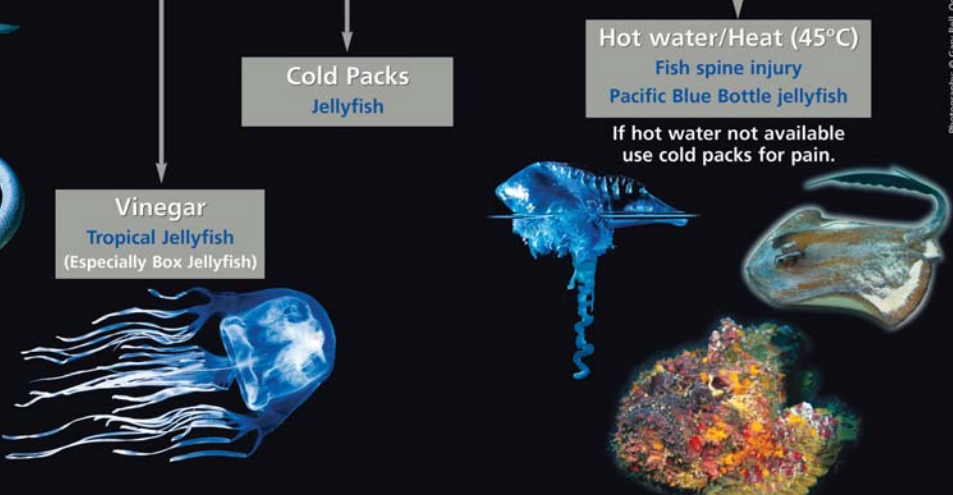
**Restrict venom flow/
Prevent further envenomation**

- Pressure-Immobilisation**
Sea Snake
Blue-ringed Octopus
Cone Shell




Pain reduction

- Cold Packs**
Jellyfish
- Hot water/Heat (45°C)**
Fish spine injury
Pacific Blue Bottle jellyfish
- Vinegar**
Tropical Jellyfish
(Especially Box Jellyfish)



Antivenom is available for:
- Sea Snakes - Box Jellyfish - Stonefish

Enquiries: Australian Venoms Research Unit
1300 760 451 +61 3 8344 7753



**For First Aid advice,
call the DAN Diving Emergency Service:
1800 088 200 or +61 8 8212 9242**