

"DOCTOR AT SEA" a monthly Column in The Islander Magazine

'ear, 'ear!

Perhaps the corny title made you look twice - or maybe not " maybe you have experience of ear problems which are actually very common amongst yachties.

The ear can be understood in three categories, based on the anatomy " first the outer ear, then the middle ear and finally the inner ear.

The outer ear is the part we can see and it extends as the ear hole or canal up to the ear drum which separates the outer ear from the middle ear. The middle ear is a compartment beyond the ear drum and it communicates with the outside world via a tube (the Eustachian tube) which opens up at the back of the throat. Therefore the middle ear is normally at atmospheric pressure. It contains three interconnected bones (the ossicles) which start on the inner surface of the ear drum and end on the connection with the inner ear and the organ of hearing (the cochlea). The ossicles amplify the sound pressure waves vibrating on the ear drum by a factor of about 3 by the time they reach the cochlea. The cochlea is in the inner ear which also contains the organ of balance (the labyrinth). The cochlea is a delicate structure which converts pressure waves into nerve messages which are processed by the brain into sound.

Sea water in the canal can cause an outer ear infection (swimmer's ear) which is best treated by impregnating the area with antibiotic drops or spray. Wax can sometimes build up in the canal and aggravate the retention of water and cause temporary deafness. More persistent deafness can occur if the canal is blocked completely by wax and this justifies syringing, probably after applying wax softening drops, but otherwise wax should be left alone and should certainly not be removed with cotton buds which have a habit of impacting the wax against the ear drum (like a snow plough if you know what that is from your part of the world!) and sometimes the cotton gets left behind and forms the focus of a nasty outer ear infection.

A heavy cold can produce profuse catarrh which blocks the Eustachian tube and prevents equilibration of pressures as well as producing a stagnant catarrhal middle ear compartment which easily becomes infected and the gumming up of the ossicles and the middle ear compartment produces the familiar deafness of catarrhal conditions. The infected material swells and this causes pain and ultimately possible perforation of the ear drum which does result in rapid pain relief but potential scarring to the drum and a subsequent possible adverse effect on hearing. This infected condition may improve with oral antibiotics, and pain relief, but it is clearly not advisable to undertake flying or diving in a very catarrhal condition because the pressure differentials can cause pain and also possible perforation of the ear drum in an alternative but damaging attempt to equilibrate pressures. Children may be more prone to this condition due to immature Eustachian tube function and can benefit from the insertion of grommets into the ear drums which then facilitate ventilation of the middle ear and also avoid unplanned and repeated ear drum perforation.

The delicate nerve endings of the cochlea can be damaged irreversibly with sustained loud noise exposure and historically this was a common association with engine room noise in marine engineers. Hearing protection is now widely practised in industry and in the merchant navy so that noise-induced hearing loss is avoided but only if noise levels are minimised and all precautions are taken.

The inner ear also contains the organ of balance (the labyrinth) and this enables us to maintain a three-dimensional positional fix. We take this for granted until one of the coordinates is affected by, say, a virus (labyrinthitis) and suddenly the outside world literally appears to spin (rotational vertigo) and we feel nauseated and start vomiting. Sea sickness can be understood as the same process in reverse in that the position of the outside world is actually changing repeatedly and the labyrinth is repeatedly stimulated and not allowed to establish a positional fix. The persistent stimulation produced by whole body vibration associated with wave motion at sea produces the labyrinthine symptoms of nausea and vomiting which is all too familiar to sailors until their

bodies have made longer term adjustments. Sea sickness medications are various forms of "labyrinthine sedatives" which are also used for treatment of labyrinthitis and true vertigo (actual perception of rotational disturbance).

The ears are small structures but incredibly complex and wonderfully successful most of the time at facilitating hearing and balance. Sometimes things go wrong but remedies are available for the common ailments. Most larger craft have suitable medical kits on board and someone who has had training on a medical care onboard ship course. Good equipment and good training can prevent ear-related problems from growing out of control and spoiling life on the open sea.

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