

## **ACOUSTIC TRAUMA AND HEARING LOSS INFORMATION PAPER**

### **Background**

- Many patients exposed to significant acoustic trauma will experience hearing loss, which can be either temporary (temporary threshold shift, TTS) or permanent (permanent threshold shift, PTS).
- The symptoms of hearing loss due to acoustic trauma include tinnitus (ringing in the ear), aural fullness, recruitment (ear pain with loud noise), difficulty localizing sounds, and difficulty hearing in a noisy background.
- TTS will resolve with time. A PTS occurs when the patient's hearing loss does not resolve over the ensuing days or weeks. There are no clinical predictors of which patients with a temporary shift will go on to have a permanent shift.
- Many patients exposed to significant acoustic trauma will also sustain a perforated tympanic membrane (TM).
- Most perforated TMs (90%) will resolve spontaneously; the smaller the perforation, the greater the likelihood of spontaneous closure.
- Most dizziness following acoustic trauma is due to the associated Traumatic Brain Injury and is not otologic in nature.
- Vertigo is a sensation of movement and must be differentiated from dizziness. Patients often describe vertigo as a spinning sensation or the feeling they are on a boat.

### **Evaluation and Treatment**

- All patients exposed to loud burst noise as can occur from IEDs, rockets and small arm fire should be specifically asked about hearing loss in addition to an evaluation for traumatic brain injury and treatment of wounds and bleeding.
- Remove all debris from the external auditory canal (EAC) and visualize the TM. Do not irrigate the ear as it may provoke pain and vertigo.
- If there is debris in the EAC or the middle ear (as seen through a TM perforation), treat the patient with a fluoroquinolone topical antibiotic, e.g. Cipro HC 5 drops in the affected ear bid for 7 days.
- Hearing loss that persists 72 hours after acoustic trauma warrants a hearing test, available at LSA Anaconda (Mustang Clinic), Mosul (399<sup>th</sup> CSH), Al-Asad (Navy Clinic), TQ Surgical, Fallujah (Navy Clinic), and Baghdad (28<sup>th</sup> CSH). In addition, hearing booths will soon be available at the ASMC at Tikrit, Tallil, Camp Liberty and the Sather hospital at the Victory base complex and the Al Asad Multinational Force Hospital.
- While hearing loss is present, individuals should be restricted from noise hazardous environments and kept on base if possible. This is important

because the Soldier will be less mission effective with hearing loss and will allow time for healing.

- Consider evacuation out of theater (without Level III evaluation) for patients with hearing thresholds greater than 60 dB on three consecutive frequencies.
- Patients should keep water out of their EAC until the TM perforation is healed.

**Absolute Indications for Otolaryngology (ENT) Referral (332<sup>nd</sup> EMDG, Balad)**

- Vertigo that does not resolve within 3 days, especially if episodic and associated with exertion
- Clear otorrhea
- Persistent discolored otorrhea that does not resolve after 7 days of topical antibiotic therapy

**Absolute Indications for Audiology Referral (28<sup>th</sup> CSH, Baghdad)**

- Average hearing thresholds of frequencies 500, 1000, 2000 Hz greater than 30 dB OR greater than 35 dB at any of these frequencies OR any hearing threshold greater than 55 dB at 3000 or 4000 Hz
- New onset asymmetrical hearing loss, defined as a difference of 25dB between two adjacent frequencies in either ear, i.e. 10 dB at 2000 Hz in the right ear and 35 dB at 2000 Hz in the left ear

**Relative Indications for Otolaryngology (ENT) Referral (332<sup>nd</sup> EMDG, Balad)**

- TM perforations greater than 50% of the surface area
- Debris in the EAC or middle ear that does not resolve with topical antibiotics
- Inability to visualize the TM despite removal of debris from the EAC

**Relative Indications for Audiology Referral (28<sup>th</sup> CSH, Baghdad)**

- Significant communication problems regardless of the hearing test results
- Tinnitus that interferes with the patient's duty performance or lifestyle regardless of hearing test results