

EXPOSURE TO SHORT-TERM HIGH INTENSITY NOISE AND BLAST INDUCED TRAUMA TO THE EAR ON OPERATIONS

Introduction

1. Personnel on operations may be exposed to blast, which may damage the ear (Blast Induced Trauma to the Ear (BITE)). Exposure to Short-term High Intensity Noise (SHIN) (as may be experienced in a firefight) may also cause damage. This policy provides guidance on the management of those exposed to SHIN or suffering BITE on operations.

Background

2. Hearing damage due to short or long term noise exposure is a well recognised phenomenon. Short term exposure can occur in response to a single high intensity sound pressure wave, as occurs in blasts. Military operations may expose service personnel to blasts from incidents such as IEDs, with resultant hearing loss. Exposure to blast in a confined space has a higher risk of causing BITE.

3. Although audiometry is the standard method of assessing hearing loss, it is not available at all locations during operations. This policy addresses the need to assess individuals with symptoms after exposure to blast/SHIN to exclude or manage significant hearing damage without returning everyone for audiometry in rear echelon areas.

Applicability

4. This policy is intended for personnel on operations with BITE or exposure to SHIN who are otherwise fit, or have minor injuries not requiring medical evacuation. It does not deal with other forms of otitic barotraumas, (e.g. related to diving or aviation), or with damage to the ear caused by direct trauma (e.g. a physical blow to the ear). However, where relevant, the same principles of management may be applied in such circumstances both on operations, on exercises and in the home base. It is intended for use by MOs, nurses, and medics¹.

5. General information appears in the main section, with specific advice on operational management at different tiers of care in the Annexes, including care flow diagrams.

6. Individuals who have been exposed to blast may have sustained other injuries including Concussion/mTBI (see [JSP 950 Leaflet 2-4-3](#)) or blast lung and may be at risk of psychological problems such as stress reactions or Post Traumatic Stress Disorder (see [JSP 950 Leaflet 2-7-1](#)), which should be considered by those providing medical care. The presence or absence of a ruptured Tympanic Membrane (TM) has a poor correlation with other blast injury and should not be relied upon in assessing individuals for such conditions. Management of associated conditions is not discussed further here.

Problems associated with BITE and exposure to SHIN

7. The main types of damage that may be caused by BITE are as follows:

- a. Hearing loss - Temporary Threshold Shift (TTS).
- b. Hearing loss - Permanent Threshold Shift (PTS).
- c. Tinnitus.
- d. Tympanic rupture, which may include

¹ RN MA, Army CMT (including RCMT), and RAF Medics.

(1) Ossicular chain disruption.

(2) Perilymph fistula.

e. Basal skull fracture with sudden hearing loss.

These conditions may exist in isolation, or combination. However, it is likely that after exposure to a blast sufficient to cause tympanic rupture or perilymph fistula, there will be hearing loss, which should therefore be regarded as the cardinal feature of BITE. Only a-c are likely to occur with exposure to SHIN.

8. **TTS.** TTS is a temporary hearing loss. Continued exposure to excess levels of noise may lead to TTS becoming permanent. The duration of hearing loss from TTS varies between individuals. For the purposes of this policy, median recovery time is taken as 28 days, with any hearing loss remaining after 6 months being regarded as PTS².

9. **PTS.** PTS is caused by a permanent destruction of the hair cells in the cochlea. It is currently irrecoverable, leading to permanent hearing loss.

10. **Tinnitus.** Tinnitus can be perceived as a high pitched whine, ringing or whistling sound, which may be audible only in quiet environments, or may be distracting in working or social environments. It may cause significant debility, including disturbing sleep or broken concentration. Currently there are no objective tests for tinnitus, or cure, although treatment may help to manage the symptoms. It may resolve with time, as for TTS. After acoustic trauma, it will normally be associated with hearing loss but not in all cases.

11. **Tympanic rupture.** Traumatic rupture of the tympanic membrane may result in small or large perforations. The amount of hearing loss will be broadly proportional to the size of the perforation. Hearing loss will be conductive. Perforated eardrum may also be associated with the following:

a. Earache or discomfort.

b. Bleeding or mucus discharge from the ear.

c. Tinnitus.

d. Increased risk of infection.

12. Blast producing ossicular chain disruption will be associated with profound conductive hearing loss. It requires referral for ENT opinion. It should be suspected in those who fail to show any improvement in their hearing after exposure to blast with a conductive hearing loss pattern, in those with large perforations, and where the ossicles can be seen and appear disrupted.

13. **Perilymph fistula.** In cases where there is persistent vertigo/disturbance of balance with or without ear discharge, a perilymph fistula should be suspected.

14. **Basal skull fracture.** Individuals with a history of head trauma who present with sudden hearing loss may have a basal skull fracture.

² This is for individuals who have no further noise exposure in excess of the Lower Exposure Action Value of 80 dB(A).

Principles of Management on Operations

15. The management of BITE on operations will depend on the severity of symptoms, the location of the individual, the availability of medical staff and the medical equipment available. For the purposes of this policy, management is considered at the following typical levels of care (based on the current operational situation):

- a. **Patrol Base (PB).** Role 1 - Medic +/- MO, minimal equipment.
- b. **Forward Operating Base (FOB).** Role 1 - MO, medic, limited equipment.
- c. **Main Operating Base (MOB) or Role 2/3 Location.** Role 2/3 - MOs, basic equipment for investigation of BITE which may include screening audiometer³ and tuning forks.
- d. **UK / Home Base.** Role 4 - Access to ENT, audiology and OM consultants with specialist investigations including clinical audiometry and imaging.

16. The principle to be adopted is that individuals are to be managed as far forward as is safe and reasonable without compromising their clinical recovery. Those with minimal symptoms who are able to continue to perform their duties without compromising their safety, the safety of others or their recovery may be retained at their current location, but should be followed up appropriately. Those requiring further investigation or who cannot be managed without compromising safety should be returned to the next level of care.

17. Whilst under investigation for hearing loss or BITE, personnel, and their CoC, should be reminded of the need to protect themselves from further noise exposure. Before any return to duty they should have their understanding of the need for and use of hearing protection confirmed. Supervision of the use of hearing protection is a line management responsibility; line management should therefore also be informed of the situation, within the normal limits of medical confidentiality.

18. In most cases, a perforated eardrum will heal by itself without treatment within 6-8 weeks. Any pain or discomfort should be treated with simple analgesics, such as paracetamol. Routine use of antibiotics is not indicated. However, patients should be warned of the need to keep the ear clean and dry, and to report any discharge. They should be reviewed regularly. Cotton wool coated in petroleum jelly may be used to prevent water getting into the ear when washing or showering, and may be useful to prevent dust entering the ear canal.

19. Individuals suspected of having ossicular chain disruption or a perilymph fistula require aeromedical evacuation to the UK. Individuals who may have a basal skull fracture should be investigated and managed in accordance with appropriate clinical guidelines

20. Further detailed guidance on the management at each level is at Annexes A-D, which should be read in conjunction with this leaflet.

Data Capture

21. In order to enable subsequent analysis of those suffering BITE or being exposed to SHIN, medical data needs to be recorded in a consistent manner. The following Read codes should be used for recording BITE and its associated conditions. Where there is no access to DMICP/Deployed DMICP, suitable entries should be made in the FMed 965 for later transcription.

³ Availability of audiometry will vary widely depending on circumstances. Policy should be interpreted in line with availability.

Diagnosis	Read Code	Comments
BITE occurring on operations (Primary Read code)	War Injury due to Explosion NOS {TP3z}	Requires exposure to blast and one of more of the following:
BITE occurring during peacetime (Primary Read code)	Explosion Causing Air Pressure Effects {SN34}	<ul style="list-style-type: none"> - hearing loss, - tinnitus, - vestibular dysfunction, - tympanic rupture, - ossicular chain disruption - perilymph fistula
TTS and PTS	Hearing loss {F59}	To be used during the first 6 months, unless otherwise advised by a Consultant in ENT, Audiology or Occupational Medicine.
Tinnitus	Tinnitus {F583}	
Tympanic rupture	Tympanic membrane perforation {F542}	
Ossicular chain disruption	Ear Ossicle Dislocation {F5522}	Only used if diagnosis confirmed by ENT specialist
Perilymph fistula	Labyrinthine Round Window Fistula {F5641} or Labyrinthine Oval Window Fistula {F5642}	Only used if diagnosis confirmed by ENT specialist

Employability

22. Personnel with symptomatic BITE may be employed in theatre dependant on a functional assessment. This must include assessment of hearing and the ability to do their job; an audiogram where available; balance; and any requirement for regular medical review. Hearing no worse than H2 in both ears, is currently the minimum required standard for basic military purposes, although in certain employments, H1 may be needed⁴.

Theatre holding policy

23. The length of time an individual with medical limitations may be retained in theatre is defined by the theatre holding policy (THP) and will vary between operations. Individuals with BITE requiring further specialist medical care not available in theatre, such as those with suspected or confirmed ossicular chain disruption or perilymph fistula, should be evacuated under normal arrangements. Those with tympanic rupture, vertigo or hearing loss should be retained in a safe environment up to the limit of the THP or 28 days, whichever is earlier. If they remain symptomatic (including an inability to achieve H2 hearing bilaterally where audiometry is available) at the end of this period, they should be evacuated to UK as Priority 3 aeromed patients for further investigation.

Downgrading

24. Personnel whose symptoms last beyond 56 days should be downgraded L4 "Unfit exposure to noise above lower exposure action value" (code 213) MLD on a temporary JMES. The E

⁴ Eg Aircrew, Air Traffic Controllers where a drop for H1 to H2 will require assessment of safety critical hearing related tasks before continuing work.

element should be E1 if remaining on operations, or E3 if being evacuated to UK. As only those with tinnitus without hearing loss are not required to return to UK at 28 days maximum, the majority of such downgradings will occur in UK. Subsequent grading should be defined with single Service occupational health input.

Audit

25. Adherence to BITE / SHIN policy should be audited by units on a regular basis. Criteria are as follows:

- a. All personnel suffering BITE / SHIN who are returned to Role 3 are to have audiometry (where facility exists and other injuries permit).
- b. All personnel symptomatic after 56 days to be downgraded L4 (code 213) MLD.
- c. All personnel with suspected or proven ossicular chain disruption or perilymph fistula to be returned to UK.

26. Standard is 95% compliance.

27. Searches should include the Read codes "War Injury due to Explosion NOS {TP3z}" for those on operations and "Explosion Causing Air Pressure Effects {SN34}" for those during peacetime.

Training

28. All staff who may be required to use this policy are to receive appropriate training in its use. This is to include any of the associated knowledge and skills required to apply this policy effectively (e.g. taking a hearing history, examination of the ear). Provision of training is a unit responsibility and should be integrated into medical update training.

Annexes:

- A. Guidelines for Initial Assessment and Management of BITE and Those Exposed to SHIN.
- B. Guidelines for Further Assessment and Management of BITE and Those Exposed to SHIN.
- C. Guidelines for the Assessment and Management of BITE and Exposure to SHIN at Role 4 and Home Base.
- D. Flow Diagrams for Assessment and Management of BITE and Those Exposed to SHIN.
- E. Guidelines for Functional Hearing Check of Bite and Those Exposed to SHIN Where Audiometry is Not Available.

GUIDELINES FOR INITIAL ASSESSMENT AND MANAGEMENT OF BITE AND THOSE EXPOSED TO SHIN

Applicability

1. These guidelines apply to all personnel who have hearing or balance related symptoms having been in close proximity to blast and who may have therefore sustained injuries to the ears. They apply where either:
 - a. The sole injury is to the ears, or
 - b. Other injuries have been treated and evacuation up the casualty chain would not be required in the absence of any ear injury.
2. Although these guidelines are primarily for Role 1 (PB or FOB), they should be used for the initial assessment of individuals first presenting at Role 2 or 3.

Personnel

3. These guidelines are to be used by MOs, nurses or medics¹ who have responsibility for the care of personnel in the field, Role 1 or Role 2 environments.

Timing

4. Personnel complaining of symptoms after exposure to SHIN or who may have sustained BITE are to be assessed at the earliest safe opportunity.

History

5. Direct questioning is to be made about the following symptoms:
 - a. Deafness (including degree and effect on ability to perform duties).
 - b. Tinnitus.
 - c. Otagia (earache).
 - d. Otorrhoea (discharge or bleeding from the ear).
 - e. Imbalance.

Examination

6. Symptomatic personnel after exposure to SHIN or who may have sustained BITE are to be evacuated to the nearest facility where an otoscope is available for otoscopy by appropriately trained medical personnel as soon as is operationally practicable.

Management

7. The initial management of BITE or exposure to SHIN is outlined at Annex D Appendix 1.

¹ RN MA, Army CMT (including RCMT), and RAF Medics.

8. Active bleeding or discharge from the ear may indicate serious injury and the injured individual is to be evacuated to a higher level of care (ideally Role 3) as soon as is reasonably practicable.
9. If otoscopy reveals any other abnormality (perforation; infection; fluid or blood seen behind the ear drum), the individual is to be evacuated to Role 3 for further management.
10. If otoscopy reveals a normal tympanic membrane, a functional test of hearing is to be undertaken in accordance with Annex E. If the individual passes the test, they may return to duty.
11. If the individual fails the functional test, it may be due to a temporary hearing loss. They should be allocated quiet duties for up to 2 weeks, and are to be made unfit for patrolling or sentry duty, and should use appropriate hearing protection, with consideration of double protection (ear plug and ear muff) when in noisy areas or potentially exposed to noise. After 2 weeks, the functional hearing test is to be repeated. The individual may return to unrestricted duties if they pass the test, with failure requiring evacuation to Role 3 for further management.
12. Personnel who are permitted to return to duty should be reminded of the need to use hearing protection, and correct usage reinforced. They should be advised to avoid exposure to loud noise (where possible) including the use of personal stereos; this advice should be recorded in their medical record.

For algorithm, see Annex D Appendix 1

GUIDELINES FOR FURTHER ASSESSMENT AND MANAGEMENT OF BITE AND THOSE EXPOSED TO SHIN

Applicability

1. These guidelines apply to all personnel referred back to an appropriate medical facility capable of management of BITE/SHIN¹. Those sustaining BITE whilst based at a MOB should be managed according to the provisions of Annex A. However, all personnel should have an audiogram where the facility exists. Personnel with other injuries/medical conditions should be managed as required clinically and by any other policy specific to their condition.

Personnel

2. This algorithm should be applied by MOs or nurses/medics² specifically trained and authorised by an MO.

Timing

3. Personnel referred for management of BITE should be assessed within 24hrs of arrival at MOB. Whilst they continue to be symptomatic they should be reassessed at weekly intervals thereafter, unless more frequent review is clinically indicated.

History

4. At each review, history is to include specific questioning to identify the following, using the Read codes laid out in Para 21 of the Policy:

- a. Exposure to blast / SHIN and date.
- b. Problems with hearing
 - (1) Conversations.
 - (2) In noisy environments.
 - (3) At work.
- c. Fluctuating hearing loss.
- d. Side affected (right/left/bilateral) and if bilateral, which side is worst affected.
- e. Otalgia.
- f. Discharge (including nature of discharge) or bleeding from ear.
- g. Tinnitus, including degree and any disturbance of sleep.
- h. Problems with balance (vertigo).
- i. Nausea and/or vomiting.
- j. Problems with memory or concentration.

¹ Eg Role 2 or 3 medical facility at MOB. This may vary in the maritime environment.

² RN MA, Army CMT (including RCMT), and RAF Medics.

Examination

5. At each review, examination is to include:
 - a. Otoscopy.
 - b. Tuning fork tests (using C=512Hz fork) – Rinne³ and Weber⁴.
 - c. Audiometry (on alternate weeks).
 - d. Examination of the cranial nerves.
 - e. Rombergs (static and heel-to-toe).

Management

6. All personnel should be reminded of the need to use hearing protection, and correct usage reinforced. They should be advised to avoid exposure to loud noise (where possible) including in social settings / the use of personal stereos.
7. Where a medical officer has suspicions of ossicular chain disruption or perilymph fistula, individuals should be returned to UK /Home Base by routine aeromed for management in accordance with Annex C.
8. If there is a perforated tympanic membrane, individuals should be advised to keep the ear dry, and should be prescribed antibiotics if an infection occurs. Simple analgesics should be given for pain. Individuals with a large perforation, which does not show significant signs of healing by 4 weeks, should be discussed with a consultant in ORL to decide if they need to return to UK by routine aeromed.
9. Personnel who have been returned to MOB for management have de-facto been assessed as unfit for their normal role. They may be employed at the MOB within any required functional limitations. These limitations should be assessed on a case-by-case basis.
10. If personnel show improvement in their symptoms, consideration should be given to returning them to their normal unit as soon as they are deemed capable of undertaking their duties safely. This decision should be made after discussion with their normal medical attendant. Individuals must have a minimum of H2,H2 hearing before returning to duty; higher auditory acuity may be required for specific roles⁵.
11. Individuals who reach the time limit of the Theatre Holding Policy (THP) and who are unable to fulfil a useful role should be returned to UK as routine Aeromed patients. Those who are able to undertake useful limited duties and whom line management wish to retain may remain in theatre, even if this is outside the routine THP.

³ In a normal ear, air conduction (AC) is better than bone conduction (BC) (AC > BC), and should be recorded as a positive Rinne. In conductive hearing loss, bone conduction is better than air (AC < BC), which should be recorded as a negative Rinne. In sensorineural hearing loss, bone conduction and air conduction are both equally reduced, maintaining the relative difference of bone and air conduction (AC > BC), resulting in a positive Rinne.

⁴ With normal ears, the tone is heard either in the middle or is not localised at all. In unilateral conductive hearing loss, the sound is heard louder in the affected ear. In unilateral sensorineural hearing loss the sound is louder in the unaffected ear.

⁵ See Paragraph 22 of the policy.

12. Individuals who are symptomatic should be downgraded after the index event in accordance with single service guidelines.

For algorithm, see Annex D Appendix 2.

GUIDELINES FOR THE ASSESSMENT AND MANAGEMENT OF BITE AND EXPOSURE TO SHIN AT ROLE 4 AND HOME BASE

Applicability

1. These guidelines apply to personnel who have been returned to the UK or other home bases from military combat operations and exercises because they have sustained blast induced trauma to the ear (BITE) or have had exposure to short-term high intensity noise (SHIN).
2. Where BITE or exposure to SHIN has occurred with other injuries, those other injuries usually take priority. Seriously injured personnel evacuated to Role 4 should have management of ear injuries undertaken as part of the overall treatment package. The possibility of BITE should be considered in **all** personnel who have been injured in this way and assessment made in line with Annex B, including referral to an ENT surgeon if indicated. No personnel who have sustained injuries due to a blast should leave hospital without having been assessed for BITE.
3. Evacuation to Role 4 should have been undertaken urgently in accordance with Annex B if BITE or, rarely, exposure SHIN has given rise to symptoms or signs that may indicate serious injury or complications as follows:
 - a. Bleeding or discharge from the ear.
 - b. Haemotympanum (blood in the middle ear cavity behind the tympanic membrane).
 - c. Significant imbalance.

Subsequent management of the ear injuries will be according to normal practice.

4. These guidelines do not mandate management of the acute phase of BITE or problems arising from exposure to SHIN in NHS hospitals or under local arrangements overseas. This should be undertaken according to established principles, based upon sound clinical judgment. Instead, these guidelines are intended to assist in the management of individuals, either during the rehabilitation stage after acute hospital treatment, or if hospitalization has not been required, for management in primary care.

Personnel

5. These guidelines are intended for the use of DMS primary care physicians who have overall responsibility for the care of military patients. Recognizing that civilian specialists may not be familiar with Service working environments and medical employment standards, guidelines for ENT surgeons for the management of hearing loss in military personnel are at JSP 950 2-17-3 which should be copied with the ENT referral for military patients. Where reservists are followed-up through their own GP a military review should be arranged for grading once the follow-up is completed.

Timing

6. Personnel returned to Home Base because of isolated BITE or exposure to SHIN should be assessed by a MO by the end of the next normal working day.
7. Where individuals have sustained other serious injuries, but have not required acute treatment for the ears, and have now recovered sufficiently to begin rehabilitation, management of the ears should be in accordance with these guidelines.

History

8. At each review, history is to include specific questioning to identify the following, using the indicated Read codes:
- A routine ENT clinical history, with emphasis on hearing disability and tinnitus. Particular enquiry should be made for discharge or bleeding from the ears, earache, and imbalance.
 - A detailed history of the causative event, including any disturbance of consciousness and the use and type of hearing protection at the time.
 - A summary of the patient's employment history, including work-based noise exposure, such as weapons, proximity to machinery, travel in aircraft and vehicles, and other sources of noise.
 - A history of noise exposure away from work, such as hobbies, concerts and clubs, personal music players.
 - Current and past use of hearing protection.
9. The history should be supplemented by scrutiny of medical documents, including paper documents (FMed4 and enclosures) and electronic records.

Examination

10. At each review, examination should include:
- Inspection of the outer ear and tympanic membrane. Particular care should be taken to look for haemotympanum or perforation of the tympanic membrane.
 - Clinical assessment of hearing, including the use of tuning fork tests¹ as appropriate.
 - Tympanometry (if available) or observation of tympanic movement during Valsalva or Frenzel manoeuvre.
 - Examination of the nose and throat as appropriate.
11. Pure tone audiometry should be undertaken in accordance with Leaflet 6-4-4. In order to ensure that audiometry is not affected by a temporary threshold shift, it is important to ensure that an individual has not been exposed to loud noise within a period of at least 16 hours immediately prior to the audiometry. If there is any doubt about the noise levels experienced during repatriation, pure tone audiometry should be repeated after not less than 48 hours².
12. Facilities should be available for the removal of ear wax if it is found to obscure a view of the tympanic membrane. If a perforation is suspected, the ear should not be syringed.

¹ A C512 tuning fork should be used.

² For the purposes of this policy, TTS is defined as lasting up to 6 months. Therefore if there is a reduction in measured auditory acuity, individuals should ideally be retested after a prolonged period away from noise.

Immediate management

13. If there is haemotympanum, discharge or bleeding from the ears, earache, or imbalance, not previously detected, the case should be discussed urgently with an ENT specialist and consideration given to referral to the local MDHU, NHS or other hospital.

14. If there is a dry perforation of the tympanic membrane, or if any other new abnormality of the tympanic membrane is found, routine specialist referral should normally be made to the local military or NHS hospital, taking into consideration the individual patient's preferences. In uncomplicated cases, prior to this, a period of watchful waiting of not more than 3 months may be undertaken in primary care.

15. The current audiogram should be compared with previous audiograms in order to determine whether or not there has been progression of any hearing impairment. If the individual meets the minimum standard for their employment in both ears, they may be returned to duties in accordance with a medical risk assessment. The opportunity should be taken at the time of the consultation to consolidate education on protection of the ears. Hearing conservation is to be undertaken afterwards in accordance with established policy.

16. If there has been no significant acute loss (not more than 10 dB persistent loss at any frequency after retesting), disposal should be in accordance with Leaflet 6-4-2.

17. If there has been a significant acute loss (15 dB or more at any frequency) or the individual is H3 or worse in at least one ear, the patient is to be downgraded temporarily MND for 6 months and further noise exposure is to be avoided. Monthly audiometry is to be undertaken and once the individual meets the minimum standard for their employment in both ears they may be returned to duties in accordance with paragraph 14. Those with persistent loss after 6 months should be referred for managed as outlined below.

18. Rarely, there may be a profound hearing loss across all frequencies. If this is suspected, the individual should be referred promptly to the Defence Audiology Service (DAS) or Clinical Measurements Department (Audiology) in BFG, for confirmation.

Management of ruptured tympanic membrane

19. The longer term management of individuals following BITE or exposure to SHIN depends upon whether the tympanic membranes are intact or not. If they are both intact, the sole issue is hearing. If rupture has occurred, there may be spontaneous healing, but if not, consideration should be given to surgical reconstruction. Policy is at Lft 2-17-1.

Management of persistent hearing loss

20. In those with intact tympanic membranes (including after spontaneous healing of a rupture), and persistent hearing loss, referral should be made to sS OH physician. If the hearing is H3 or worse in either ear, the individual should be referred to DAS) or Clinical Measurements Department (Audiology) in BFG for confirmation. Subsequent management will depend on the results of investigations and OH advice, and should include consideration of referral to a Medical Board for of a permanent MES in those H3. Hearing aids may be considered via referral to a Service ENT / Audiology Department.

Management - tinnitus

21. Tinnitus is a subjective perception of sound which does not arise from a noise stimulus in the environment. It is thought to occur because regulation of stimuli along the auditory pathways is disturbed when hearing is diminished. Any cause of hearing loss carries a risk of tinnitus, but it appears to be particularly common following BITE or exposure to SHIN. If there is improvement of hearing, there may be associated resolution or improvement of tinnitus. Policy is at Lft 2-17-1.

For algorithm, see Annex D Appendix 3

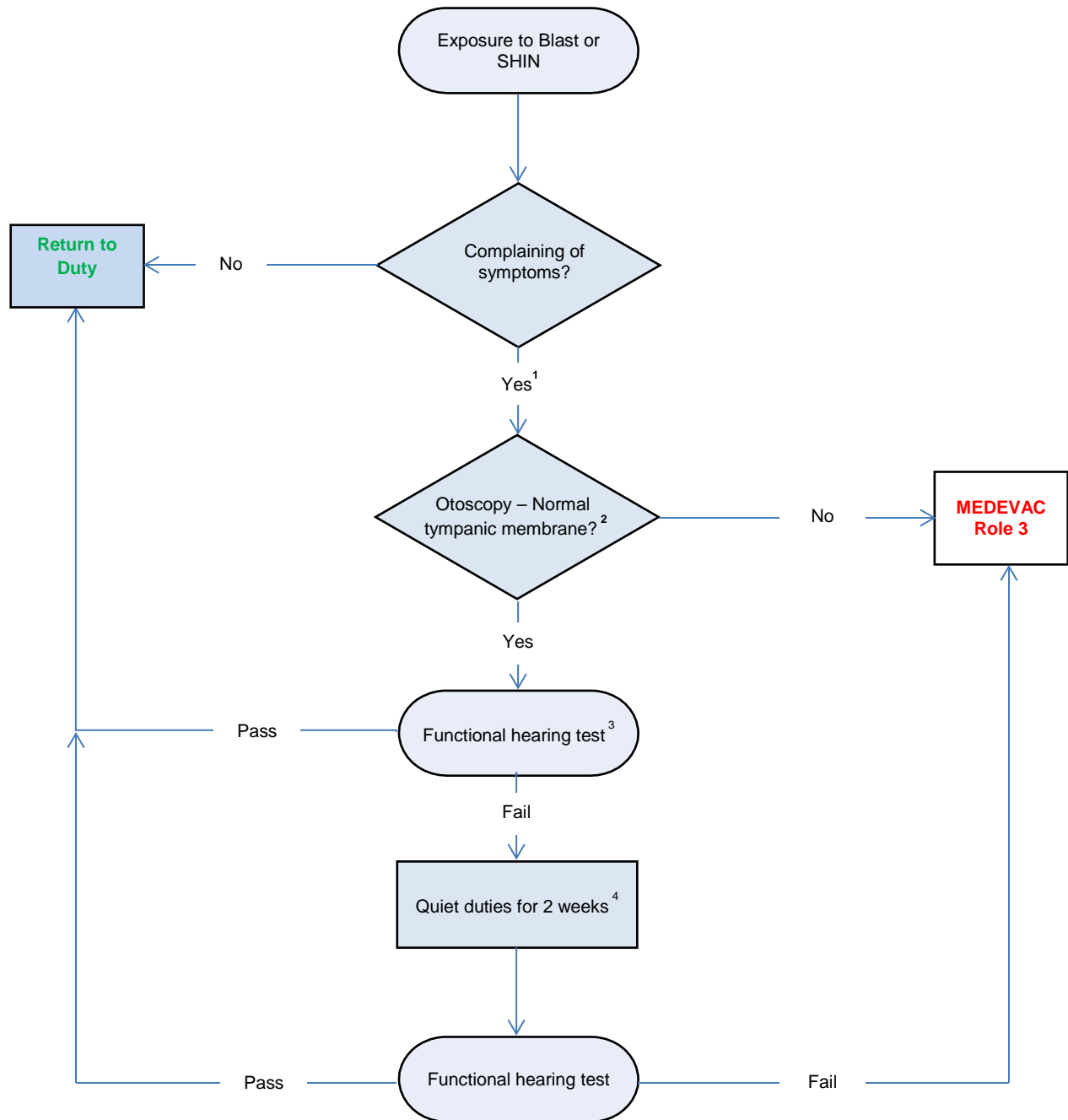
FLOW DIAGRAMS FOR ASSESSMENT AND MANAGEMENT OF BITE AND THOSE EXPOSED TO SHIN

1. Appendices 1-3 contain flow diagrams to aid the assessment and management of individuals with BITE or exposure to SHIN. They are to be used in conjunction with the appropriate Annex to JSP 950 Lft 2-17-2 where more detailed guidance is given.

Appendices:

1. Initial Assessment of Personnel Exposed To Blast or SHIN.
2. Further Assessment of Personnel Exposed To Blast or SHIN.
3. Role 4 Assessment of Personnel Exposed To Blast or SHIN.

INITIAL ASSESMENT OF PERSONNEL EXPOSED TO BLAST OR SHIN



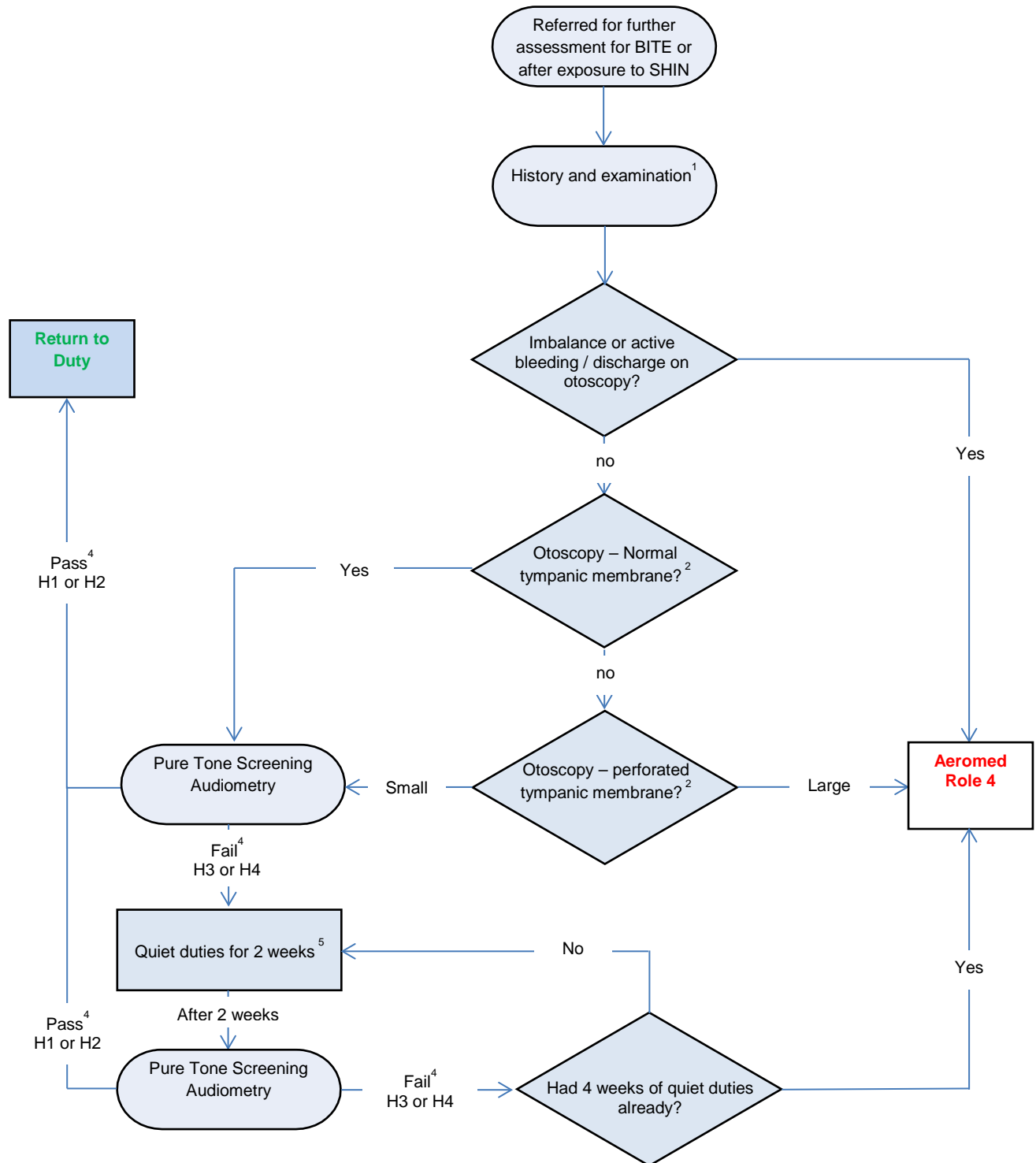
¹ All symptomatic personnel are to be evacuated to the nearest facility capable of undertaking otoscopy

² Otoscopy is considered normal if there is no bleeding, discharge, perforation, infection or fluid behind the tympanic membrane. Chronic perforations previously diagnosed and risk assessed as being fit for deployment may be regarded as normal.

³ Functional hearing check is described at Annex E to JSP 950 Lft 2-17-2

⁴ Personnel retained in forward locations are not to undertake patrolling or guarding, and must use appropriate hearing protection. The decision to retain such personnel is a line management responsibility based on medical advice.

FURTHER ASSESMENT OF PERSONNEL EXPOSED TO BLAST OR SHIN



¹ History and examination as per Annex B to JSP 950 2-17-2

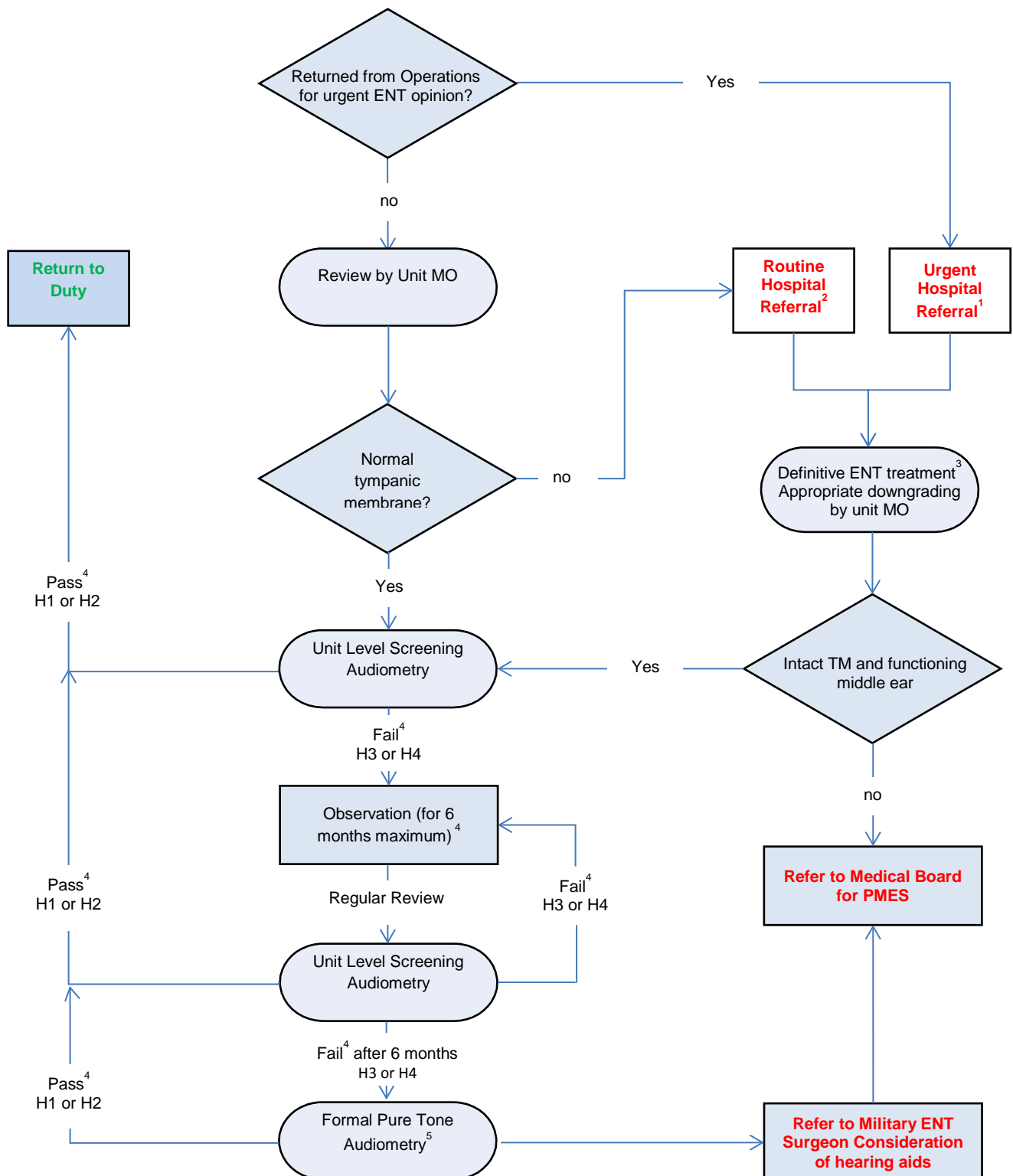
² Chronic perforations previously diagnosed and risk assessed as being fit for deployment may be regarded as normal

³ A small perforation is defined as one where the diameter of the perforation is less than half the diameter of the tympanic membrane, and no greater than $\frac{1}{4}$ of the surface area. All others are defined as large.

⁴ A pass requires H1 or H2 hearing in both ears. Those with H3 or H4 in either ear are classed as a fail.

⁵ Personnel retained in forward locations are not to undertake patrolling or guarding and must use appropriate hearing protection. The decision to retain such personnel is a line management responsibility based on medical advice

ROLE 4 ASSESMENT OF PERSONNEL EXPOSED TO BLAST OR SHIN



¹ Personnel may be aeromedically evacuated directly to UHB/RCDM, which is the preferred hospital for all urgent referrals

² Routine referrals may go to military or NHS hospitals

³ Definitive treatment is not complete until the patient has been discharged from regular follow-up. Appropriate downgrading is required during this period

⁴ A pass requires H1 or H2 hearing in both ears. Those with H3 or H4 in either ear are classed as a fail.

⁵ Referral to Defence Audiological Service / Clinical Measurements (Audiology BFG) for clinical audiometry is required.

GUIDELINES FOR FUNCTIONAL HEARING CHECK OF BITE AND THOSE EXPOSED TO SHIN WHERE AUDIOMETRY IS NOT AVAILABLE

1. The normal method for assessing hearing loss is by audiometry, which may be to an industrial screening standard as in medical centres on unit, or to a clinical standard, as in hospital. However, on operations there may be occasions when it is necessary to undertake a functional hearing check, and where access to audiometry is limited. The following guidance is designed to permit basic screening to identify those who need referral for audiometry, pending the development of a screening tool for use in deployed environments.

Screening

2. Personnel should be asked the following questions:

- a. Can you hear sufficiently well to be able to perform your routine duties?
- b. Can you hear sufficiently well to be able to perform your most hearing critical duties (such as taking point on patrol)?

3. Inquiry should also be made of the individual's comrades and direct supervisor as to whether the individual can hear sufficiently well to be able to perform their normal duties. Normal guidelines on confidentiality apply – whilst the opinion of others may be sought, no clinical information may be divulged without permission of the individual.

4. If the responses indicates no concern and the individual complains of no symptoms, they are fit full duties. If any of the responses indicate doubt about the individual's ability to hear, if ear symptoms are present, or if they appear to have problems with their hearing, they should be given restricted duties or referred for further assessment and audiometry as per the appropriate guidance.

5. Where audiometry or speech-in-noise tests are available locally they should be used to supplement the screening above.