

**Bone Anchored Hearing Aid  
Service Standards  
Draft 8**

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# Table of Contents

<b>1</b>	<b><i>Introduction</i></b> .....	<b>4</b>
<b>2</b>	<b><i>Bone Anchored Hearing Aid Team</i></b> .....	<b>4</b>
<b>2.1</b>	<b>Key members must include:</b> .....	<b>4</b>
2.1.1	The ENT Consultant Surgeon.....	4
2.1.2	The Audiologist/Audiological Scientist.....	4
2.1.3	The Nurse.....	4
2.1.4	The Team Co-ordinator .....	5
2.1.5	The Key worker.....	5
<b>2.2</b>	<b>Additional valuable members could include:</b> .....	<b>5</b>
2.2.1	The Audiological Physician .....	5
2.2.2	The Speech and Language Therapist (for pre-school paediatric cases).....	5
2.2.3	Early years specialist/Teacher of the deaf (for paediatric cases).....	5
2.2.4	The Administrator.....	5
<b>2.3</b>	<b>Training</b> .....	<b>5</b>
<b>3</b>	<b><i>Clinical Facilities and Accommodation (Audiology)</i></b> .....	<b>6</b>
<b>3.1</b>	<b>Accommodation</b> .....	<b>6</b>
<b>3.2</b>	<b>Facilities</b> .....	<b>6</b>
<b>4</b>	<b><i>Patient Referral for Assessment</i></b> .....	<b>6</b>
<b>4.1</b>	<b>General</b> .....	<b>6</b>
<b>4.2</b>	<b>Referral routes</b> .....	<b>6</b>
<b>4.3</b>	<b>Referral process</b> .....	<b>7</b>
<b>4.4</b>	<b>Information to referring party</b> .....	<b>7</b>
<b>5</b>	<b><i>Information to patients/carers</i></b> .....	<b>7</b>
<b>5.1</b>	<b>General</b> .....	<b>7</b>
<b>5.2</b>	<b>Prior to assessment</b> .....	<b>7</b>
<b>5.3</b>	<b>During assessment</b> .....	<b>7</b>
<b>5.4</b>	<b>During first fit appointment</b> .....	<b>7</b>
<b>5.5</b>	<b>During follow up and review appointments</b> .....	<b>8</b>
<b>5.6</b>	<b>Meeting other BAHA users</b> .....	<b>8</b>
<b>5.7</b>	<b>Consent</b> .....	<b>8</b>
<b>6</b>	<b><i>Selection Criteria</i></b> .....	<b>8</b>
<b>6.1</b>	<b>General</b> .....	<b>8</b>
<b>6.2</b>	<b>Audiological criteria</b> .....	<b>8</b>
<b>6.3</b>	<b>Otological criteria</b> .....	<b>9</b>
<b>6.4</b>	<b>Other criteria</b> .....	<b>9</b>
<b>6.5</b>	<b>Funding</b> .....	<b>9</b>
<b>7</b>	<b><i>Assessment</i></b> .....	<b>9</b>
<b>7.1</b>	<b>Appointments</b> .....	<b>9</b>
<b>7.2</b>	<b>Audiological assessment</b> .....	<b>9</b>
<b>7.3</b>	<b>Surgical assessment</b> .....	<b>10</b>

7.4	Other assessment.....	10
7.5	Outcome of Assessment.....	10
8	<i>Surgery, Post operative Care, BAHA fitting and ongoing evaluation .....</i>	<i>10</i>
8.1	Surgery .....	10
8.2	Post operative care .....	11
8.3	Initial BAHA device fitting.....	11
8.4	Four week audiological follow up of BAHA fitting .....	11
8.5	Three month audiological follow up of BAHA fitting .....	12
8.6	Annual review.....	12
8.7	Long term maintenance and care .....	12
9	<i>Patient Pathway.....</i>	<i>13</i>
10	<i>Technical Issues.....</i>	<i>14</i>
10.1	BAHA device .....	14
10.2	System accessories .....	14
10.3	NHS Property.....	14
11	<i>Audit/Service Monitoring .....</i>	<i>14</i>
12	<i>References .....</i>	<i>15</i>
13	<i>Acknowledgements.....</i>	<i>15</i>

# 1 Introduction

This document has been developed by the BAHA team at the North East Wales NHS Trust, Wrexham, in collaboration with a number of other centres and agencies across the UK. The standards have been designed as a draft document to offer a guide to best practice for all aspects of a Bone Anchored Hearing Aid service.

The standards refer to practice for both adult and paediatric cases but for a more detailed guide to services for children and young people please refer to the NDCS 'Quality Standards in Bone Anchored Hearing Aids for Children and Young People' (available on the NDCS website, [www.ndcs.org.uk](http://www.ndcs.org.uk)).

## 2 Bone Anchored Hearing Aid Team

A multidisciplinary team, who are responsible for the assessment, surgery and support of the patient and BAHA system.

### 2.1 *Key members must include:*

#### 2.1.1 The ENT Consultant Surgeon

- Will have overall clinical responsibility for the patient
- Will assess suitability for surgery
- Will perform surgery and provide medical and clinical care
- Should have attended recognised surgical training on BAHA equipment

#### 2.1.2 The Audiologist/Audiological Scientist

- The audiologist will field referrals from within the Audiology Department and refer for assessment where appropriate
- Will perform hearing assessment and hearing aid evaluations on potential candidates
- Will fit BAHA device following surgery and provide appropriate rehabilitation
- Will perform outcome measures pre and post BAHA provision
- Will provide maintenance of BAHA system
- Will be MTO grade 3 or above or audiological scientist
- Will have completed a period of suitable BAHA training
- Should have a minimum of three years experience in paediatric audiology when dealing with paediatric cases

#### 2.1.3 The Nurse

- Will be responsible for wound care
- Will provide patient training and support for wound care management
- Should have attended a recognised course on BAHA site care and management
- Will provide information and support to the patient with regards to surgical procedures
- Should provide an opportunity for video viewing of surgical procedures

#### 2.1.4 The Team Co-ordinator

- Will be responsible for the co-ordination of the BAHA team and services
- Will be a point of reference for the programme
- Will secure funding for out of area referrals
- Will manage stock
- Will co-ordinate the audit of BAHA services

Will liaise with other local service providers, in case of tertiary referrals, to maintain appropriate levels of care

#### 2.1.5 The Key worker

- Chosen, by the patient/parent, from the above team for each individual patient
- Will provide a point of contact for the patient
- Will liaise closely with all members of the team to offer a cohesive service

This post holder needs to be able to link with other professionals/departments for the child's/families additional needs

### **2.2 Additional valuable members could include:**

#### 2.2.1 The Audiological Physician

- May carry out some of the medical and audiological assessment

#### 2.2.2 The Speech and Language Therapist (for pre-school paediatric cases)

- Will assess speech and language development prior to BAHA fitting
- Will monitor speech and language development following fitting of BAHA
- In cases of very early surgical or softband BAHA provision, will provide appropriate speech and language goals and support to meet these goals

#### 2.2.3 Early years specialist/Teacher of the deaf (for paediatric cases)

- Will provide support to help the young child acquire communication skills
- Following parental consent , will provide assessment and support within the home and educational setting

#### 2.2.4 The Administrator

- Will provide administrative support to the BAHA team
- Will process referrals
- Will manage Audiological waiting lists and book appointments
- Will liaise between Audiology and ENT Clerical staff to ensure clear transition between audiology and ENT services

### **2.3 Training**

- All staff working within the BAHA team should have the appropriate qualifications and experience to practice

- This should include attendance of a recognised BAHA training course related to their area of speciality (as mentioned previously)
- New members of the BAHA team should attend team meetings, multi-disciplinary clinics and surgical procedures as part of their training
- New members of the BAHA team should work alongside experienced members during their period of training
- The BAHA service must provide information and training to local service professionals regards BAHA equipment and use

## **3 Clinical Facilities and Accommodation (Audiology)**

### **3.1 Accommodation**

- Audiological accommodation must comply with the criteria set out in *RNID Best Practice Standards for Adult Audiology, 2002*. These include:
  - Appropriate number of rooms
  - Room size
  - Permissible ambient noise
  - Essential rehabilitation and general accommodation features
- In paediatric cases, accommodation must offer child/family friendly facilities and conform to standards set out in *NDCS Quality Standards in Paediatric Audiology Vol IV 2000 (under revision)*

### **3.2 Facilities**

- Facilities should be available for:
  - Full hearing aid evaluation using Real Ear Measurement
  - Puretone audiometry including masked bone conduction
  - Speech discrimination assessment
  - Tympanometry
  - Soundfield unaided and aided hearing assessment
  - Objective measures of auditory function (ABR: AC and BC)
  - DVD/Video display

## **4 Patient Referral for Assessment**

### **4.1 General**

- All ENT and Audiology staff should be aware of the process for referral for BAHA assessment
- It should be made clear to the patient by all referring staff that a BAHA hearing aid may not be appropriate for all who are referred for assessment

### **4.2 Referral routes**

- Referrals should be accepted by the BAHA surgeon from:
  - Clinical staff within the BAHA centre's Audiology and ENT departments

- External ENT Consultants/Physicians/General Practitioners

#### **4.3 Referral process**

- Referrals should be processed by the administrator
- Assessment appointments will be within 12 weeks of the receipt of the referral
- An appointment letter will reach the patient at least 2 weeks prior to the appointment

#### **4.4 Information to referring party**

- Outcomes of every stage of assessment and procedure will be forwarded to the patient's referrer and to their General Practitioner

## **5 Information to patients/carers**

### **5.1 General**

- All verbal information given to patients should be supported in written form.
- All written information should be in an accessible format.
- An opportunity for questions to be answered must be provided at all stages

### **5.2 Prior to assessment**

All information sent prior to assessment must reach the patient at least 4 weeks before the appointment date. Information must include:

- Details of the assessment procedure including length of time of appointment
- General information regards BAHA systems, surgery and care
- Brief explanation of alternative management options
- Team Coordinator's contact information for patient queries

### **5.3 During assessment**

This information should be given during the assessment and must include:

- Details on the surgical and rehabilitative procedures as appropriate
- Explanation and details of the device chosen for the patient
- Benefits and risks of surgery and fitting of BAHA system will be discussed with the patient by the ENT doctor during assessment and on subsequent occasions as necessary
- Particular detail will be given to the need for good hygiene of the site
- long term implication of the fitting of a BAHA system
- Alternative management options
- Realistic expectations regards surgery and outcome during initial consultation and on subsequent occasions as necessary

### **5.4 During first fit appointment**

This information should be given during the first fit and must include:

- Further details on the use and care of the device
- Information about BAHA accessories, other useful equipment and services

- Particular detail will be given to the need for continued good hygiene of the site
- Realistic expectations regards outcome

### **5.5 *During follow up and review appointments***

This information should be given during follow up and review appointments and must include:

- Further information about BAHA accessories, other useful equipment and services
- Details of any change in services or updated equipment
- Particular detail will be given to the need for continued good hygiene of the site
- Details of access for repair or replacement of BAHA systems

### **5.6 *Meeting other BAHA users***

- All potential candidates should be offered the opportunity to meet a current BAHA user prior to decision making and surgery
- Where ever possible these users should be matched in age, outcome expectation and social background with the candidate
- Ideally, the candidate should be encouraged to meet with the BAHA user group for a cross section of information and opinion
- Details of other national and local support groups should also be provided

### **5.7 *Consent***

- Informed consent must be obtained in writing before surgical procedure

## **6 Selection Criteria**

### **6.1 *General***

- BAHA systems are recommended in cases of conductive or mixed hearing loss where cochlea function is still at a level to benefit from amplification. Particularly where the use of an air conduction aid is limited or prohibited due to external or middle ear abnormalities
- BAHA systems should be considered in cases of single sided deafness where there is significant permanent sensorineural hearing impairment in one ear
- All selection criteria should be based on relevant evidence based research and should be reviewed regularly and updated were necessary
- Criteria should be available in writing for candidates and referring professionals

### **6.2 *Audiological criteria***

- Pure tone average bone conduction thresholds (0.5, 1,2,3 kHz), of the ear to be fitted, should be  $\leq 45$ dB HL for consideration of the ear level device

- Pure tone average bone conduction thresholds (0.5, 1,2,3 kHz), of the ear to be fitted, should be  $\leq 55$ dB HL for consideration of the body worn device
- Consideration should be given to the configuration of the hearing loss as well as average thresholds.
- Additionally, where assessment is considered appropriate, speech discrimination scores  $>60\%$  using PB word lists

### **6.3 Otological criteria**

- Congenital malformation of the middle or external ear
- OR Chronic external or middle ear infection or other conditions that prevent or limit the use of air conduction aids
- OR Single-sided deafness
- Sufficient bone volume and quality to maintain successful fixture placement
- Expectation of successful osseointegration
- General health status appropriate for surgery

### **6.4 Other criteria**

The patient/parent must display:

- Realistic expectation regards the surgical procedure and long term outcome of BAHA systems for them or their child
- A commitment to the procedure as a whole, including the ongoing care of the device and site of surgery
- Suitable level of understanding for the need for good personal hygiene so as not to interfere with the success of surgery or long term care of the abutment site

### **6.5 Funding**

- There must be an agreed commitment to funding of the BAHA system by the Health Authority
- In cases of out of area referrals, this commitment to funding must be secured in writing on an individual basis.

## **7 Assessment**

### **7.1 Appointments**

- A BAHA clinic should offer a comprehensive and cohesive one stop appointment
- Otherwise, assessment appointments should be co-ordinated
- Assessments should occur within 12 weeks of receipt of referral
- Information about the assessment process must be sent to the patient and parents at least 4 weeks before the appointment date

### **7.2 Audiological assessment**

- Otoscopy to assess current external and middle ear status
- Hearing assessment using pure tone audiometry, including air and bone conduction thresholds

- Additionally, where appropriate, speech discrimination evaluation using speech audiometry with PB word lists
- Bite bar test
- Where appropriate, trial of air conduction hearing aids and evaluation using Real Ear Measurements and sound field audiometry to ensure optimal amplification
- Where appropriate, evaluation of ear mould and interaction with external and middle ear status
- Pre operative audiological questionnaires and assessment of individual needs

### **7.3 Surgical assessment**

- Examination of external and middle ears
- Determination of aetiology of hearing loss
- Assessment of general medical status and suitability for surgery

### **7.4 Other assessment**

- A joint assessment of the optimal side for implantation
- All professionals involved with the assessment process should assess the patient's or (in paediatric cases) the family's motivation and commitment to the BAHA surgery and long term care
- All professionals involved with the assessment process should assess the personal hygiene levels of the candidate, particularly in relation to the site of surgery
- In paediatric cases, a specific carer must be identified to clean and maintain the abutment site post surgery and longer term

### **7.5 Outcome of Assessment**

- Decisions regarding the audiological and medical suitability of a BAHA system will be discussed by the clinicians within the BAHA team in consultation with the patient/carers
- This decision will be discussed with the patient/carers on the day of the assessment where ever possible
- Otherwise, the patient should be informed of the outcome of assessment within 5 working days
- The patient/carers will be involved in the decision regards the intended side of surgery and provisional date for surgery
- The patient's referrer and GP should be informed of the outcome of the assessment and patients final decision within 10 working days. This report should include reasons for non suitability and intention for hearing aid provision

## **8 Surgery, Post operative Care, BAHA fitting and ongoing evaluation**

### **8.1 Surgery**

- The BAHA surgeon is responsible for the overall clinical care of the patient

- Surgical procedures and potential complications will be explained to the patient by the surgical team prior to gaining patient consent
- Day case surgery, under local anaesthetic will be considered where appropriate
- A two stage procedure must be considered in paediatric cases, with at least 4 months between operations
- In paediatric cases, consideration should be given to the fitting of a second 'sleeper' fixture in case of future damage or failure

### **8.2 Post operative care**

- Clear verbal and written instructions must be available to the patient regards wound and abutment care
- Emergency access to ENT or audiology should be available in cases of early postoperative concerns with wound or abutment and patients must be given contact details and information
- A post operative ENT appointment will assess wound status and fixture osseointegration
- The ENT surgeon will indicate when the fixture is ready for loading with the BAHA. This will be in written form to the Audiology Department
- In paediatric cases the site must not be loaded before 6 months, and 4 months in young people and adults

### **8.3 Initial BAHA device fitting**

- Initial BAHA device fitting will take place in suitable rehabilitation room (see section on clinical features and accommodation)
- BAHA device settings should be adjusted based on audiometric results and patient response
- The output of the device should be measured using electroacoustic methods using a skull simulator and appropriate test box. Results should be recorded for future reference
- Based on individual circumstances, consideration should be given to the fitting of BAHA accessories including telecoil, directional microphone and direct audio input facilities
- In paediatric cases, close liaison with Teacher of the Deaf will be needed to ensure correct provision and function of any FM systems and appropriate provision of accessories
- Familiarity with device attachment/detachment and system controls should be ensured
- Information regards overall management and expectation should be discussed
- All information should be supported in written form that is accessible to all patients/carers and , where relevant, the child
- In paediatric cases, audiological information from initial fitting appointments should be communicated to the child's local education services with parental consent
- An appointment for a 4 week audiological follow up of the BAHA fitting should be arranged

### **8.4 Four week audiological follow up of BAHA fitting**

- Site and abutment should be inspected

- Tightness of abutment should be checked using a torque driver
- Any problems that have arisen or patients questions should be addressed
- The output of the device should be measured using electroacoustic methods, compared with the measure at the time of fitting, and recorded for future reference
- An appointment for a 3 month audiological follow up should be arranged

### **8.5 Three month audiological follow up of BAHA fitting**

- The output of the device should be measured using electroacoustic methods and recorded for future reference
- Appropriate measures of performance and outcome will be employed
  - Unaided and aided sound field audiometry
  - Post operative questionnaires
- In paediatric cases, audiological information from review appointments should be communicated to the child's local education services with parental consent

### **8.6 Annual review**

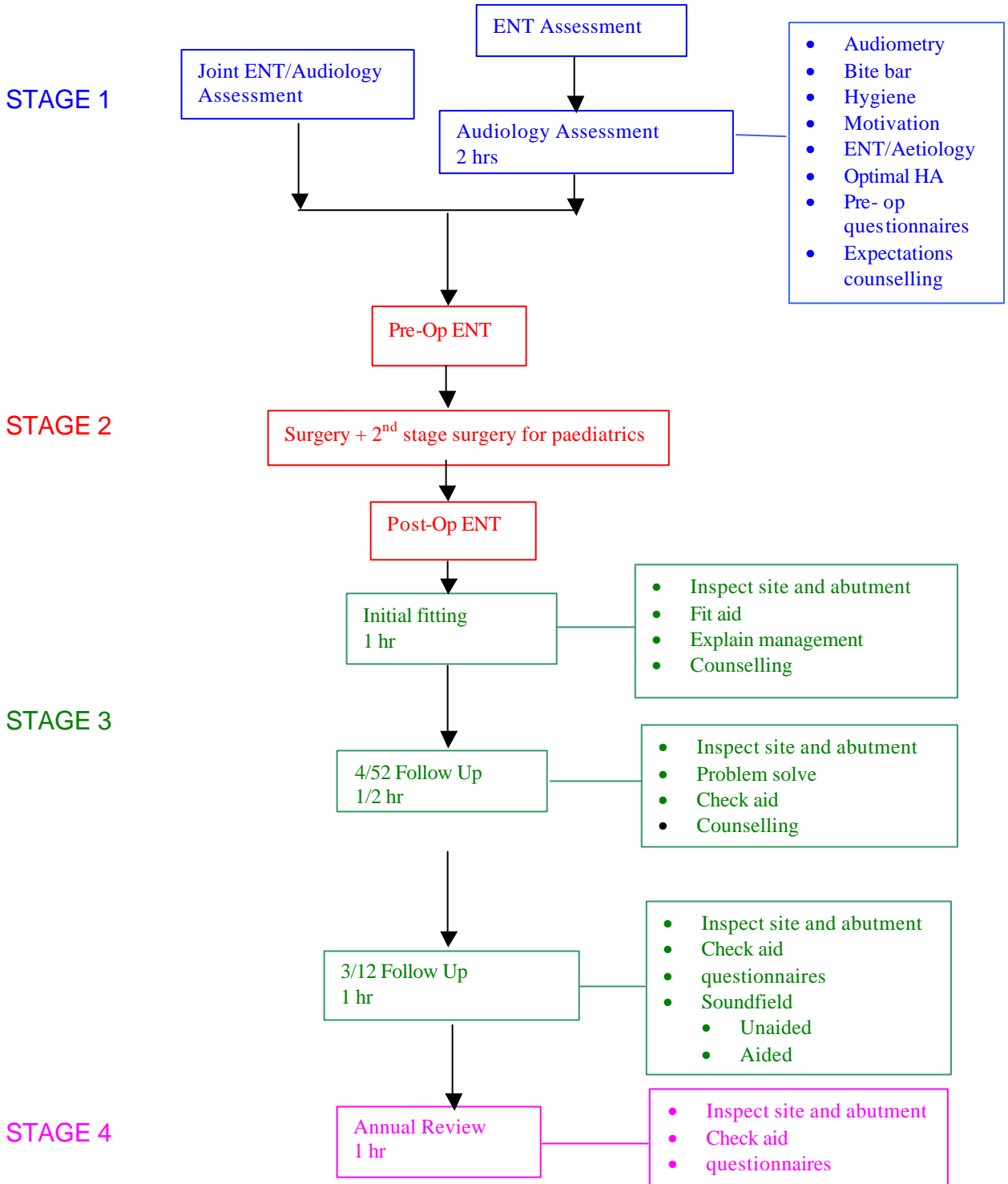
- All BAHA users will be offered an ENT and audiology annual review appointment - where possible these will be co-ordinated
- Audiological review will include:
  - The output of the device should be measured using electroacoustic methods, compared with the measure at the time of fitting, and recorded for future reference
  - Completion of questionnaire
  - Addressing any patient problems or queries
- In paediatric cases, audiological information from annual review appointments should be communicated to the child's local education services with parental consent

### **8.7 Long term maintenance and care**

- Access to audiology for repair or replacement of BAHA systems should be available during normal departmental repair times or by appointment
- Access to emergency ENT in case of injury or infection to the abutment site must be available
- Both ENT, audiology or joint annual review appointments should be able to be brought forward upon patient request
- Adequate spares/replacements must be available as required
- There should be an agreed strategy for system upgrade

## 9 Patient Pathway

A clear pathway of assessment and management must be available to candidates. This will include expected duration and content of appointments.



## 10 Technical Issues

### 10.1 BAHA device

- The BAHA device offered will be the most appropriate based on measured bone conduction thresholds
- Where bone conduction thresholds allow the device will be ear level rather than body worn
- The device should be compatible with assistive listening equipment where appropriate
- Devices will be electroacoustically checked at least annually
- Patients will be given written information regards the device that has been chosen for them prior to surgery and following fitting

### 10.2 System accessories

- BAHA system accessories, and replacements, will be available to the patient where required. These include
  - Telecoil
  - Direction microphone
  - Direct audio input facility

### 10.3 NHS Property

- The BAHA device and accessories remain the property of the National Health Service and are on free of charge loan to the patient
- Advice regards insurance and replacement BAHA shall be in accordance with Department of Health guidelines (C100 and C101, 1985)
- This does not apply to patients who have purchased their BAHA device and service privately

## 11 Audit/Service Monitoring

- Protocols and procedures will exist for each element in the assessment and rehabilitation process
- There will be regular local multidisciplinary BAHA team meetings
- At all stages through the BAHA programme appropriate methods of recording information will be used so as to permit service evaluation and audit
- The service will engage with a user group and formally sample patient satisfaction with the service on a regular basis
- The service will participate in benchmarking using agreed and defined measures.
- There will be full participation in annual multicentre audit - to include comparison against these standards

## 12 References

Department of Health Guidance Note C100 (1985) Services for Hearing Impaired People – Information Sheet – NHS Hearing Aids: Charges for loss or damage due to carelessness

Department of Health Guidance Note C101 (1985) Services for Hearing Impaired People – Information Sheet – NHS Hearing Aids: Insurance

Entific Medical Systems AB (2003) Audiological Manual - Selection Criteria, Evaluation and Fitting Procedures for BAHA

NDCS (2003) Quality Standards in Bone Anchored Hearing Aids for Children and Young People

NDCS (2000) Quality Standards in Paediatric Audiology - guidelines for the early identification and the audiological management of children with hearing loss Vol IV

RNID (2002) Best Practice Standards for Adult Audiology

## 13 Acknowledgements

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