

MANUAL ON TAKING EAR IMPRESSION

by Manjula, P Vivek, A

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MANUAL ON TAKING EAR IMPRESSION



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ALL INDIA INSTITUTE OF SPEECH AND HEARING
DEPARTMENT OF AUDIOLOGY
EAR MOULD LABORATORY
MYSORE 570 006

Ph. (0821)-2514449, 2514618
Website: www.aiishmysore.in

Fax: 0821-2510515
Email: director@aiishmysore.in

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Manual on taking ear impression**

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Prepared by: Mr. Vivek A,

Edited by: Dr. Manjula P,

DTP work: Ms. Rajalakshmi R,

Photos: Ms. Kavita N

Preface

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Hearing loss is a common sensory deficit. As per WHO estimates in India, there are approximately 63 million people, who are suffering from significant auditory impairment; this places the estimated prevalence at 6.3% in Indian population. For individuals having hearing impairment that is not amenable to medicines or surgery, hearing devices are prescribed – hearing aids are the most common of such devices. For effective fitting of the hearing aid, a custom ear mould has to be used.

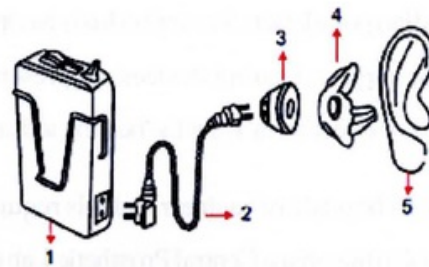
Custom ear moulds have to be made of each ear and this requires special skills. Since there is a lack of trained professional in this area a Central Prosthetic Lab (CPL) was initiated in the 11th five year plan at the institute in which the ear impressions received from different centres can be processed for making custom ear moulds. In this context, efforts are made to train the grass root level workers especially special school teachers to take good ear impressions and to mail them to the CPL for further processing. This material has been prepared with the aim of providing guideline to the trainees who attend the training on making good ear impression. This goes a long way in providing good amplification to individuals with hearing impairment.

Dr. P.Manjula and Mr. Vivek have put efforts to revise and update the training material on ***Manual on Taking Ear Impression***. Dr. P.Manjula is a faculty in Audiology and Mr. Vivek is a technical staff in the department of Audiology. They are known for their active involvement in aural rehabilitation and commitment to their work. I congratulate both of them for preparing the manual. Your comments or suggestions about the material is appreciated and can be sent through email at: director@aiishmysore.in with the subject Manual on taking ear impression.

S.R. Savithri
Director

INTRODUCTION

An ear mould also called an ear piece, is designed to couple the hearing aid to the ear of its user. It is an important link between the hearing aid and its user (Figure 1)



1. Hearing aid
2. Cord
3. Receiver
4. Ear mold
5. Ear

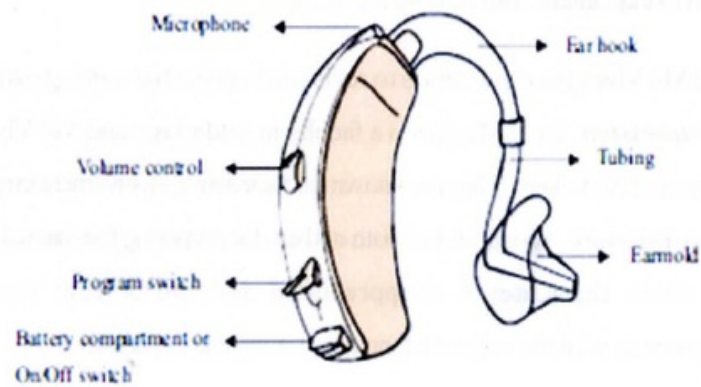


Figure 1: Ear mould as part of a hearing aid system

An ear mould has several important roles. It channels the sound from the hearing aid, through the ear canal, to the eardrum. A well-fitted ear mould directs sound from the hearing aid to the ear without feedback, allowing the user to hear comfortably, i.e. it provides the required acoustic seal. The ear mould also helps to secure the hearing aid in place. When required, the ear mould modifies the acoustic output from the hearing aid. It should be comfortable to the wearer for an extended period of time and be aesthetically acceptable to the hearing aid user.

The structure of the external ear varies from individual to individual. Hence, a custom-made ear mould is to be made. The ear impression can also be said as blueprint of the ear from which any custom-fit product can be produced, the finished product can only be as good as the impression. Any deficiencies in the impression will greatly affect the patient's satisfaction and use of the finished ear mould impression material. The two types of blocks in common use today are vented and non-vented.

ANATOMICAL LANDMARKS

Outer ear

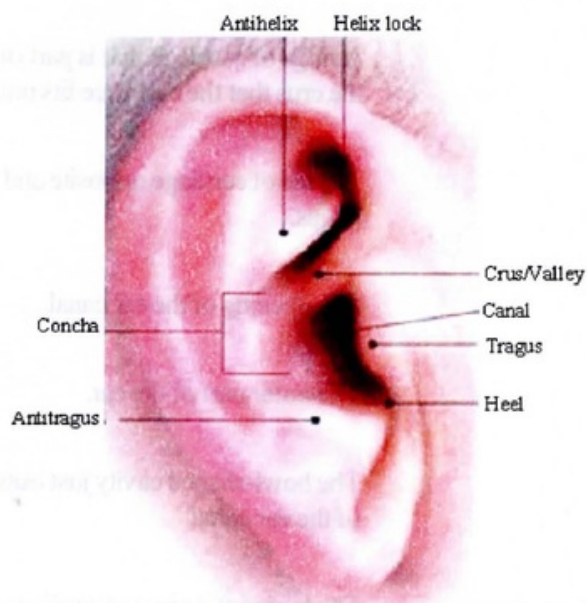


Figure 2: Anatomical landmarks of outer ear

Parts of ear mould

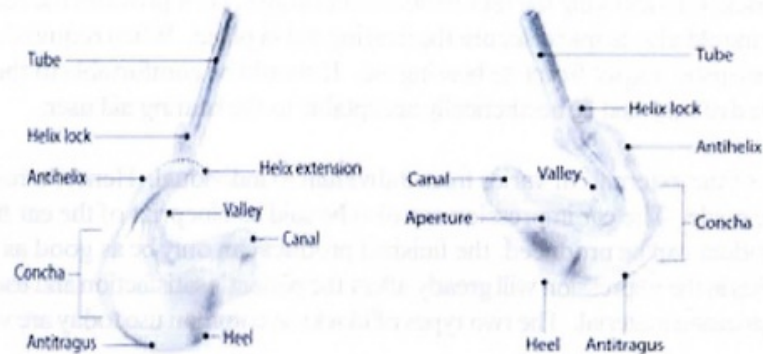


Figure 3: Parts of ear mould

1 The anatomical landmarks described here are of primary importance to the hearing healthcare provider. Several of these hold special significance for making of a proper fitting ear mould.

1 Antihelix	A ridge of cartilage that is part of the pinna, just above the crus that the ear piece fits under.
Antitragus	1 ridge of cartilage opposite and slightly below the tragus.
Aperture	The opening of the ear canal.
Auricle or pinna	The outer part of the ear.
Concha	The bowl-shaped cavity just outside of the opening of the ear canal.
Crus (ear) valley (earpiece)	The horizontal piece of cartilage located outside the ear canal that divides the upper and lower parts of the ear.

Ear canal The 2 to 3 cm long external auditory meatus, consisting of an outer cartilaginous portion and an inner bony portion.

Heel The inter-tragal notch located at the bottom of the concha bowl.

Helix lock (curl) A recessed “crevice” at the upper part of the ear, just above the valley.

Helix extension (not including lock) An extension upto but not including the Helix lock.

Tragus A small ridge in front of the external opening of the ear canal.

Canal length Since each ear mould ¹ is as unique as the patient’s ear, discussion of canal length can be a bit confusing. We use the anatomical features of each individual ear to describe canal length. Short canals are defined by the center of the first bend of the ear canal, while long canals are centered at second bend. using this as the basis for canal length, a medium canal would be cut halfway between the first bend and the second bend of the ear, while a medium long canal would be cut halfway between a medium and long canal.

The custom-made ear moulds ensures comfort and good sound quality without a acoustic feedback or sequeal. For making an ear mould, there are several steps involved. In this manual, the first step of making an ear mould, i.e., taking the ear impression and mailing it to the Central Laboratory (where facilities for further processing is available), is explained.

The manual provides information on the following topics:

1. Role of the ear moulds
2. Steps involved in making an ear mould, with specific details on making an ear impression

3. Mailing instructions
4. Use and care of ear moulds.

METHODS

Role of the ear moulds

The ear mould plays a vital role in the hearing aid fitting.

- It effectively couples the hearing aid to the ear of its user.
- It serves as an anchor and helps to provide retention to the receiver (in case of body level hearing aid) and to the hearing aid itself (in case of behind-the-ear hearing aid).
- It provides a sound channel from the hearing aid to the ear.
- If required, it modifies the sound signals from the hearing aid to the ear.

Thus, a good fitting ear mould plays a key role in ensuring optimal amplification for an individual using a hearing aid. Regular change of ear moulds will be required for a child as the child grows and the process of habilitation should not be compromised by unacceptable time delays in provision of new well-fitting ear moulds.

The ear moulds are processed from impression of portions of the external ear, i.e., pinna and ear canal. Taking impressions for making custom ear moulds is a very important step of fitting hearing aids. In order to make a good ear impression, one should have knowledge of the important anatomical landmarks of the external ear as well as possible medical problems.

The external ear

The external ear is made up of skin, cartilage, muscles and bony tissues. Figure 4 shows the important landmarks of the external ear. The parts of the external ear include helix, anti helix, crux helix, anti tragus, lobule, tragus, concha (cavum concha and cavum cymba) and the ear canal.

When inserting the cotton block in the ear canal prior to taking an impression, this tissue should not be distorted.

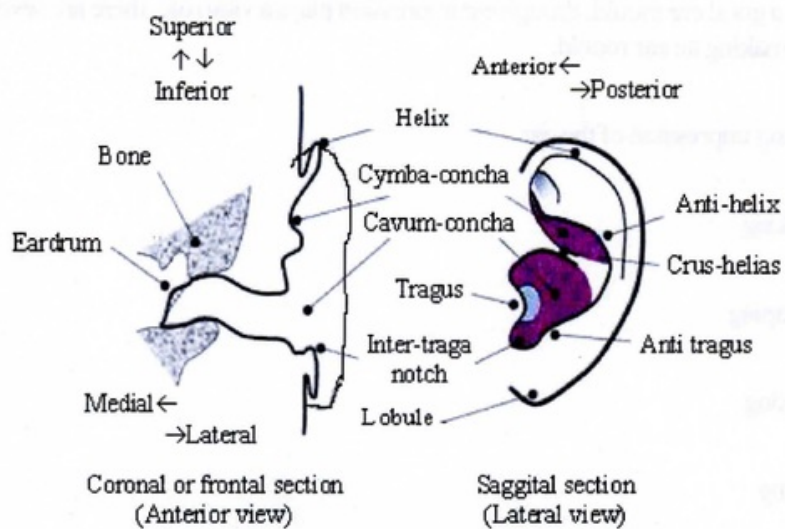


Figure 4: Side view and cross-section of the external ear

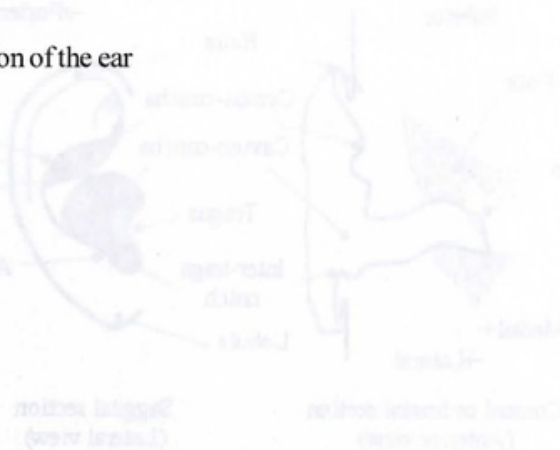
The medical conditions of the external ear that contraindicate taking ear impression include (terms are explained in the glossary):

- Malformation of the external ear - Atresia / stenosis
- Excessive / impacted earwax (cerumen)
- Ear discharge
- Perforated eardrum
- Inflammatory conditions
- Enlarged ear canal (post-operative cavity, after mastoidectomy)
- Foreign objects in the ear canal.

STEPS INVOLVED IN MAKING AN EAR MOULD

For making a good ear mould, though ear impression plays a vital role, there are several other steps involved in making an ear mould.

- i) Taking impression of the ear
- ii) Flasking
- iii) Scooping
- iv) Packing
- v) Curing
- vi) Deflasking
- vii) Trimming and Drilling
- viii) Polishing
- ix) Ring / tube fixing



Prior to taking an ear impression, it is mandatory that the ear is examined thoroughly to see if there are no contraindications mentioned earlier for taking the ear impression.

Examination of ear

Before taking an ear impression, the external ear of the client ¹ must be thoroughly examined and determined to be ¹ acceptable for the process. The examination ¹ not only allows an over view of the condition of the ear, but also can reveal contraindications (if any) ¹ to taking an ear impression. The ear examination (Figure 5a, 5b) should be performed when the client is seated, not standing, to ensure that the ear is viewed properly and to reduce the risk of accidental injury to the client.

Using an otoscope / torch / ear light to view the ear canal



Figure 5a: Using an otoscope / torch / ear light to view the ear canal

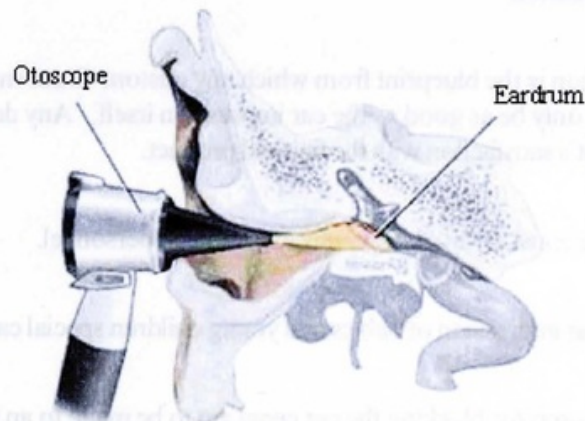


Figure 5b: Examination of the outer ear to rule out contraindications before taking an ear impression and to know the landmarks (size and direction of the canal) of the outer ear.

The ear impression must not be taken if there is a contraindication. For any of such conditions, the client has to be referred to an ENT specialist for clearance / management.

With adult clients, the canal and ear drum can best be observed by pulling the pinna up to straighten the canal for viewing. With paediatric clients, the pinna has to be pulled down on the lobe or pinna to open the canal for the otoscopic examination. This is illustrated in Figure 6.

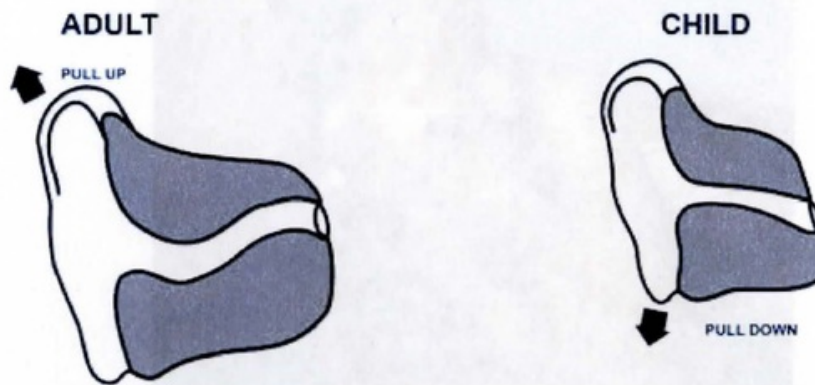


Figure 6: Handling the pinna for examination of the external ear

Taking an ear impression

Because ear impression is the blueprint from which any custom-fit ear mould will be made, the finished product can only be as good as the ear impression itself. Any deficiencies will greatly compromise the client's satisfaction with the finished product.

- * Ear impressions must always be taken by experienced personnel.
- * While taking ear impression of babies and young children special care to be taken.
- * Cotton blocks used for blocking the ear canal are to be made to an appropriate size.
- * While taking an ear impression, spectacles and ear rings should be worn if they are in everyday use.

Otoblock placement

3 otoblocks / cotton blocks / otostops are used to block the ear canal just beyond the second bend. The primary acoustic seal is established in the ear canal and is complicated by the fact that the ear

canal actually changes dimension with jaw movement.



Figure 7a: Cotton block



Figure 7b: Foam block

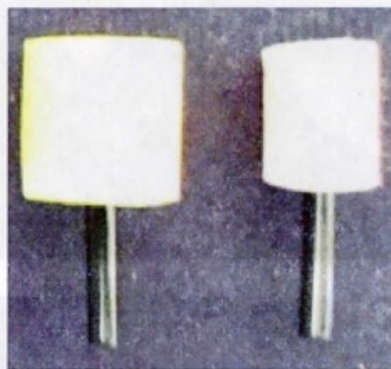


Figure 7c: Different size vented block

Using a clean ear plugger or ear light, the cotton block should be inserted into the ear canal normally to a point just beyond the second bend, i.e., approximately one-half of the way along the canal, although a shorter impression might be acceptable in some circumstances. It is important not to insert the cotton block deeper than required as this can cause unnecessary discomfort, pain and possible injury.

The external ear is examined to determine the size of the cotton block to be placed in the ear canal

and also to rule out the contraindications for taking the ear impression. A cotton block with too small a diameter allows the impression material to flow beyond the cotton block and may even touch the ear drum, causing severe pain. Too large cotton block prevents proper depth of insertion required for a good ear impression. It can also cause discomfort for the client. If the size chosen for the cotton block does not seal the ear canal, a different sized cotton block must be tried.

Once a proper sized cotton block is selected, the tip of the ear light / ear plugger can be used to place / guide the cotton block into the ear canal and to make any slight adjustments. Figure 8 shows the use of ear light to place the cotton block. Caution is to be exercised for safe insertion of the cotton block.



Figure 8: Picture on the left shows the ear light being used to place the cotton block. The hand is firmly braced against the client's head. Picture on the right shows the ear light being used to check the cotton block placement. The hand is not firmly braced against the client's head, which is a dangerous practice.

The ear light serves as an aid in cotton block placement. When using ear lights or otoscopes, it is always important to hold the ear plugger / tool properly and to use proper bracing. When using the earlight / ear plugger, the hand must be firmly braced against the client's head to prevent accidental injury. The position of the cotton block must be checked with an earlight to ensure there are no

gaps between it and the canal walls that could allow impression material to pass. The strings of the cotton block should be positioned so they can be held during syringing to prevent the cotton block moving when the impression material is injected.

Caution:

During the impression process, some clients may experience a cough or gag reflex. This is a normal response due to stimulation of the vagus nerve. To avoid injury, always brace your hand to the client's head by using the little finger (as in Figure 8). This will keep the tool in the same relative location to the ear in the event the client/patient coughs, jerks or moves suddenly.

Open and closed jaw impression

Closed jaw ear impressions are obtained when the ear impression is taken with the jaws of the client are in contact / closed. An open jaw ear impression is the one which is obtained when the ear impression is taken with the jaws kept open with the help of a bite block (as in Figure 9).



Figure 9: Bite block placement for open jaw ear impression

Better acoustic seal is obtained with open jaw impressions as acoustic feedback is avoided which may be associated with the client's jaw movements. Open jaw ear impressions should be taken whenever acoustic feedback /squeal from the hearing aid is the primary concern.

Recommended taking an open-jaw impression if any of these conditions exist:

1. Significant mandibular displacement is seen externally during jaw movements.
2. Changes in the auditory canal can be detected during the otoscopic examination.
3. The patient complains of feedback or loose fit problems related to TMJ movement.,
4. The ear mould or hearing aid lacks retention and slides out of the ear.
5. The patient reports a noticeable loss of hearing aid power caused by mandibular movement.

Mixing of ear impression material prior to injecting in the ear

Silicone impressions for making shell ear moulds and shells for custom hearing aids:

- The silicone impression material is available in two compartments in different colours
- Equal amount of both the pastes is taken and mixed thoroughly to make a homogenous mixture.
- This mixed paste is filled into the impression syringe.
- The material is injected into the ear canal and the canal is filled with the material. As the canal is filled with the material, the tip of the syringe is slowly withdrawn and the whole of concha and helix area is completely filled with the material.
- A single finger pressure is applied on the material mildly to eliminate any lines or air bubbles in the impression.

Mixing of silicone impression material:

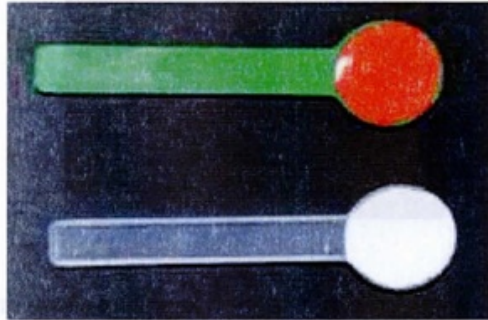


Figure 10(a): Take equal amount of both the material using the measuring spoon.



Figure 10(b): Material remove it from scoop



Figure 10(c): Mix the two materials together by blending them properly



Figure 10(d): Continue mixing until the material reaches a uniform colour



Figure 10(e): ¹ To load the silicone syringe, remove the plunger and fill the barrel of the syringe with the thoroughly mixed material

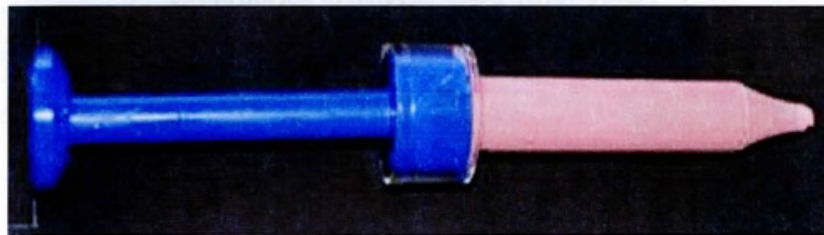


Figure 10(f): After loading the material into the syringe, put the plunger back into the syringe ³ to complete the loading process



Figure 11: Injection the ear impression material into the external ear using a syringe:
(a) The picture shows safe syringing technique with a bracing against the client's head and the cotton block strings being held.

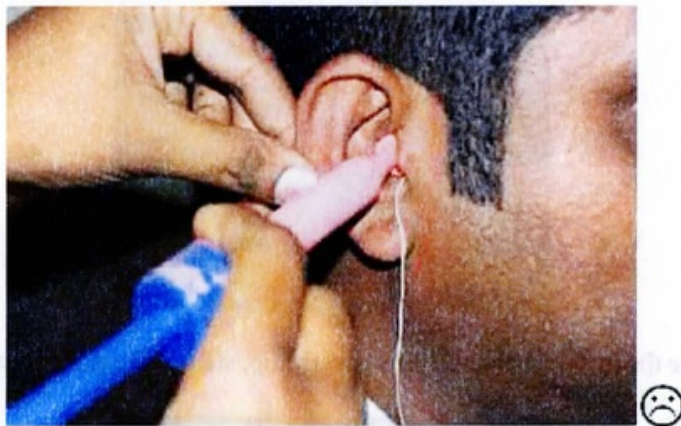
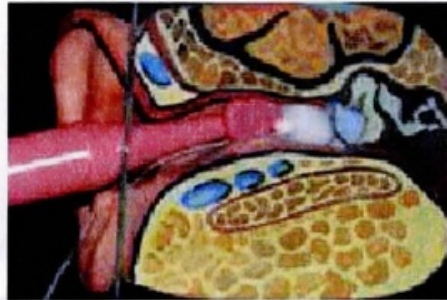


Figure 11(b) The picture shows unsafe practice with no bracing.

Using the proper bracing technique (Figure 11a&b), i.e., place the end of the mixing tip or syringe approximately 1/4 inch (6 mm) inside the ear canal opening. Gently begin to fill the impression material into the ear canal, excessive pressure must not be used to inject the material as this may cause discomfort, move the cotton block or force material beyond the cotton block, allowing the material to flow back over the syringe or mixing tip (Figure 12 a). Once the material starts to flow past the tip, start backing the tip of the syringe out of the ear canal (Figure 12 b). It is important that you fill all the landmarks in the external ear. For instance, fill the concha bowl, move up into the antihelix crevice, then follow the contour of the ear, finishing at the center of the concha (Figure 12 c).

1

After about 4 to 5 minutes, check to see if the impression has set. Press a fingernail or earlight tip gently into the material to see if an indentation remains. If there is no indentation and the material is not tacky, the impression is cured. It is then safe to remove the ear impression.



1

Figure 12a: Place the end of the mixing tip of syringe approximately 1/4 inch (6 mm) inside the ear canal opening and gently flow the material into the canal.



Figure 12b: Once the material starts to flow past the tip, start backing the tip out of the ear canal



1

Figure 12c: Fill the concha bowl, move up into the antihelix crevice, then follow the contour of the ear, finishing at the center of the concha.

Removing the ear impression

The ear impression must not be touched prior to removal, other than to check if it has set. The impression is removed from the ear after it has completely set. The string of the cotton block should not be used as a handle to aid in removal of the impression. Instead, gently pull the client's pinna up and back to break the seal (Figure 13a, 13b). Remove the impression from the antihelix area and gently rotate forward and out (Figure 13c, 13d).



(a)



(b)



(c)



Figure 13(a) (b) (c) (d): Stages of removing the ear impression

After removing the ear impression, ¹examine the ear canal for any material remaining from the impression process. In the rare case that any impression material remains and cannot be easily removed, the client will have to be referred to the appropriate medical auditory / ENT Specialist for removal.

Note: Prior to sending the client home, inspect the impression to make sure that the necessary ear canal length and all landmarks are present. This ear impression is then packed and mailed to a Central Ear Mould Laboratory which has the facilities for further processing.

Correct impression

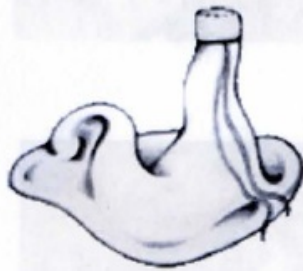


Figure 14 (a): Correct impression: Canal, concha and helix adequately filled.

Incorrect impressions



Gaps are weld marks.
Overall surface of impression
not smooth.



Distorted due to insufficient
curing time for impression, or
wrong proportion of
impression material.



Slanted under-filled canal due
to improper placing of block
in ear helix either under-filled
or pressed out.



Canal area not fully filled to
canal block, or no block used.



Insufficient canal depth.
Canal block not placed deeply
enough in the ear.



Under-filled tragus.



Mashed or bent due to
improper handling or packing.



Helix missing



Concha missing

Figure 14(b): Incorrect impressions

2

Look to be sure that your impression has these features:

1. Is the impression smooth and complete?
2. Is the canal long enough to show the beginning of the second bend?
3. Is the helix clearly defined?
4. Is the tragus clearly defined?
5. Is the concha complete?

... that it does not have these:

- a. Is the impression material itself unusually oily?
- b. Are there weld marks (caused by impression material setting-up too quickly or by failing to keep the tip in the material)?
- c. Are the edges of the folds in the concha rounded and not sharp (due to masking the material in the concha against the skull)?

Note: Special attention should be paid to the impressions canal length and diameter. Ideally, the best impression is one which fills the canal about 5-7 mm beyond the second bend, but it may not always be possible to reach this depth. In the finished ear mould, the canal length may vary depending on the degree of hearing loss.

For mild losses, the canal may be short and reach just the first bend in the canal, as in many open-fit molds. For moderate losses, the canal should go beyond the first bend, and the diameter should be able to accommodate special acoustic options you may order. In severe losses, the canal needs to be long and extend to or beyond the second bend, and the diameter should always be full.

But always take the most complete impression you can. Too much canal length on an impression is never a problem for the laboratory, too little is.

Remember also that in most cases the acoustic seal of an ear mould occurs between the aperture and the first bend, not deep within the canal. Too much canal length on a ear mould may be uncomfortable for the wearer, and can make the mold very difficult to insert and remove. Correct canal length depends entirely on the requirements of the individual patient.

MAILING INSTRUCTIONS

For processing the ear moulds, specific charges are levied. Before sending the ear impression for further processing, the charges have to be checked with the **Central Laboratory**. After you receive the ear mould from the lab, the user/parent/caregiver will **have to be counseled regarding the use and care** of ear mould.

- a. Client details like name, age, sex, address and type of ear mould, type of hearing aid with which the ear mould is to be coupled are required to be clearly written in a slip of paper. This should accompany the ear impression in a closed plastic cover.
- b. Specify the type of material with which the ear mould is to be made - hard or soft material. It must be noted that it is possible to make hard mould for body level hearing aid and soft or hard mould for ear level (BTE) hearing aids.



(a) Hard full mould for body level hearing aids



b. Hard shell mould for BTE hearing aids



c. Soft shell mould for BTE hearing aids.

Figure 15 (a) (b) (c): Different types of ear moulds

- c. Cardboard boxes of appropriate thickness and size can be used for mailing the ear impressions to the laboratory (Figure 16a). Readily available or recycled cardboard boxes may be used for this. Crumpled paper or thermocol bits can be used to further aid in securing the ear impressions from distortion while in transit (Figure 16b).

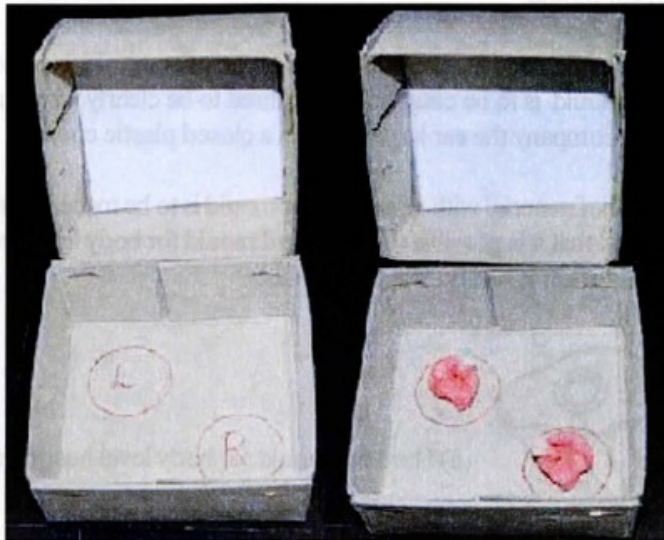


Figure 16a: Cardboard box and placement of ear impression.



Figure 16b: Ear impressions are covered with thermocol and packed firmly.

Note: Use only silicone impression material if it has to be processed elsewhere

For processing the ear moulds, specific charges are levied. Before sending the ear impression for further processing, the charges have to be checked with the central laboratory. After you receive the ear mould from the laboratory, the user / parent / caregiver will have to be counseled regarding the use and care of ear mould.

USE AND CARE OF EAR MOULDS

- a. The ear moulds are made individually. In most cases, no two individuals have identical pinna (visible portion of our ears). So, no two individuals have identical ear moulds. Thus, custom made ear moulds are required. These ear moulds cannot be interchanged. It is important that the ear mould fits well, otherwise it would be uncomfortable, and would also cause an unpleasant squeal.
- b. The ear moulds are made ear specific, implying that a mould made for the right ear can be used only for the right. Hence, care needs to be taken while wearing the ear moulds. In the case of hard mould, right and left side will be mentioned on the ear mould as in the following figure.



Figure 17: Right and left ear mould

- c. Care and maintenance of ear moulds are as important as the hearing aid itself. Hence, it is necessary for a hearing aid user to be aware of the basics of ear moulds care.
- d. The external ear (pinna and ear canal) houses an ear mould. It becomes imperative that the ear is free from foreign bodies or impacted wax or discharge prior to insertion of the ear mould. If not, please consult an ENT Specialist.

- e. The consequence of wearing ear moulds in unclean ears could be dangerous, leading to irritation, pain and infection. The unwanted particles may also block the path of the sound coming through the ear mould in the ear, reducing the benefits from the hearing aid and ear mould.
- f. Fixing the ear mould to the receiver (body level hearing aid) / ear-hook (behind-the-ear hearing aid) should be done carefully. Any loose fitting could result in the escape of sound, from the hearing aid and cause a squeal / acoustic feedback. This could result in disrupting the understanding of speech.
- g. To insert the ear mould into the ear, grasp the ear mould between your thumb and index finger, placing the canal of the ear mould in the canal of the ear. Press the ear mould gently into the ear, using a slight twisting motion. Pull the ear outwards and downwards, so that the helix of the ear mould slips snugly into the helix of the ear.



Figure 18: Insertion of ear mould

- h. While inserting the ear mould, it would be helpful if the pinna is pulled backward and upward gently. Care must be taken, not to push the ear mould too deep with force. It could bruise the soft tissues in the canal area of our ears.
- i. For proper conduction of sound, the ear mould should be clean and free of any obstructions in the sound bore. It should not be clogged with wax, dust, etc.
- j. The ear mould should be cleaned once in 3 or 4 days with luke warm soap water. It should be thoroughly dried before re-using.
- k. With children, ear moulds need periodic change since the size and shape of the external ear changes with age.

The problems with ear moulds could be the following:

- a. The ear mould may not be of the appropriate size for the ear. Get another ear mould done.
- b. The ear mould could be broken. Get another ear mould done.
- c. The sound bore of the ear mould might be blocked. Get the earmould cleaned.
- d. The tubing could be broken or hardened. Get the tubing changed.
- e. The ear mould in itself could be occluding the ear causing discomfort, pain and fullness in the ear. Consult Ear Mould Technician / Audiologist

Note: In any of these cases, if you do not find the solutions yourself, do consult your Audiologist / Ear mould Laboratory

4 Acoustic feedback / squeal

Acoustic feedback occurs when the sound coming out of the ear mould or speaker manages to get back to the microphone, and set-up a “loop” that starts the hearing aid to whistle. Here are some common causes and suggestions for this:

1) Ear wax

A wall of ear wax blocking the ear canal is a very common cause of hearing aid feedback. Sound waves have pressure as they leave the ear mould. Imagine placing the end of a garden hose against a house with the water turned-on. The water would spray out in all directions.

When the sound pressure leaving an ear mould or hearing aid hits a solid wall of earwax, it also sprays in all directions, including out through the vent or any gaps between the ear mould or shell and the ear canal.

If you have a problem with feedback, have someone check your ear canals for ear wax and get it removed. This is the most common cause of hearing aid feedback

2) Loose fit

Another common cause of feedback is poor and loose fitting ear moulds and hearing aids. Many people do not realize that losing ten or twenty pounds of weight can affect the fit of their hearing aid and also the growth of the children causing it to fit loosely.

If feedback begins right after an illness or a hospital stay, it is very likely caused by a loss of weight. A new ear mould or shell remake may be required.

TOOLS USED FOR IMPRESSION

1. Otoplastics / cotton blocks

All kinds of blocks work on the same basic principle. A cotton block is made to a specific diameter from a material that has an inherent resistance to reduction in diameter. As the cotton block is placed in an ear, it is compressed by the canal walls. The resistance of the cotton block to this compression, or what is called “radial pressure”, holds the block in place against the force of the impression material. The two types of the blocks in common use today are vented and nonvented.

a) *Vented otoplastic:*

With any conventional otoplastic (foam or cotton), once the impression material has made full contact with the ear canal wall, any air trapped behind the dam is forced to compress against the eardrum. This sensation of ear “fullness” can range from minimal to significant discomfort. A vented foam block allows for the equalization of air pressure within the ear during the impression making, curing and removal process, which can significantly reduce discomfort.

b) *Non-vented otoplastic:*

Non-vented foam / cotton blocks are available in a wide variety of sizes and are soft, comfortable, and easy to use. Size selection is the most common challenge in using a foam / cotton block. Be sure to choose the appropriate size for your patient, using visual inspection to ensure that it fits snugly in the ear canal.

2. Impression syringes

Historically, the syringe method has been used to take ear impressions of the human ear, offering clean, quick and precise control of the impression material as it enters the patient’s ear. Syringes are available in several designs to work with specific impression materials.

HELPFUL TIPS FOR BETTER IMPRESSION

1. If the patient **5** wears glasses or dentures, make sure these are in place while taking the impression.
2. Never flatten or smooth out the finished impression with the palm of your hand while impression material is in the patient's ear.
3. Use the open-jaw impression technique, particularly if you detect cartilage movement within the canal walls.

Children are sometimes fearful and can be hard to work with. Let the child watch you take an impression of other's ear to alleviate fears. Let him play with a peice of the "dough".

Swimmers plug

6 Many persons recovering from ear infections or ear surgery, as well as those with chronic conditions such as drainage, must keep their ear canals dry to prevent more severe problems from developing. While no readymade ear moulds can create an absolutely watertight seal in the ear canal, properly a custom fit ear moulds will keep out most of the moisture that can aggravate outer ear conditions. Ideal for bathing, showering or swimming, swim moulds are simply soft customear moulds without any bore or tubing.

Ear plug

Ear plugs are ideal for those who work in particularly noisy places, like at construction sites or on a railroad train or for a quiet night's sleep. Prople constantly exposed to noise who do not protect their hearing can start lose **10** it as early as in their 20s. Ear plugs are of twodifferent types, they hard and soft war plugs. Ear plugs are especially useful to people exposed to excessively noisy devices or environments (80 dB or more).

GLOSSARY

Some of the conditions or problems that can be identified by the external ear examination before taking an ear impression are:

1. **Malformation of the ear:** Abnormal shape of the pinna, complete or partial closing of the ear canal. If the client has a medical / ENT clearance you may precede taking ear impression. If not, referral is necessary
2. **Impacted ear wax (cerumen):** Wax can range from “wet” to “dry” in character. When wet, it can be yellow, brown or reddish in colour. Dry wax appears as flaky scales or hard / impacted in the ear canal. If either type is present in quantity, the client should be referred to an ENT specialist to have the wax removed.
3. **Ear discharge:** There may be fluid running from the external ear canal due to infection in the middle ear or external ear. The client should be referred to an ENT Specialist if any discharge is seen on ear examination.
 - i) **Eardrum perforation** - If a tear or perforation in the eardrum exists, referral to an ENT Specialist is necessary. In this case, a patient must have medical clearance before an ear impression is made.
 - ii) **Inflammatory conditions** - A bacterial or fungal infection in the ear canal may make the ear red and sensitive. A pimple in the pinna or ear canal may also be there. Both require medical attention prior to making an ear impression. Referral to an ENT Specialist is necessary.
 - iii) **Enlarged ear canal** - This is usually due to ear surgery. Extreme caution should be exercised with this type of client. Often there will be no ear drum or ossicles, and the canal skin will usually be very sensitive. An enlarged canal will usually require plugs placed by an ENT Specialist.
 - iv) **Foreign objects in the ear canal** - If the ear examination reveals a strange colour or shape, there may be a foreign object lodged in the ear canal. Examples are erasers, insects, cotton, peas, etc. Referral to an ENT Specialist is necessary.

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ALL INDIA INSTITUTE OF SPEECH AND HEARING
Naimisham Campus
Manasagangothri
Mysore 570 006

Ph.(0821)-2514449, 2514618
Website: www.aiishmysore.in

Fax: 0821-2510515
Email: director@aiishmysore.in

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