

YOUR CHILD'S HEARING

A COMPREHENSIVE GUIDE FOR PARENTS ON HEARING AND HEARING LOSS



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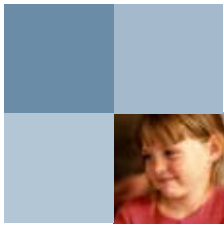
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Your Child's Hearing

Human beings have five senses through which we experience our world. A child is born with a mind that is open and ready to receive information through these senses. The more information the mind receives, the better the child is able to understand and participate in the world around them. The senses are our tools for learning and communicating.

Our sense of hearing is critical for speech and language development. It is therefore important that hearing loss is identified as early as possible. Significant delays in speech and language development can be avoided if amplification is provided early.

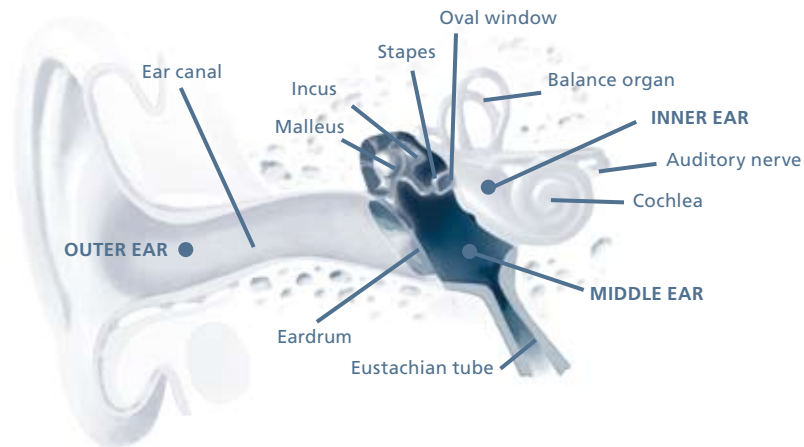
The realisation that a child has a hearing loss can be overwhelming to a parent. There is so much information to take in, and so many questions to be asked and decisions to be made. And in addition to all of these practical concerns, there can be many emotional issues.

You and your family are a vital part of your child's support team consisting also of hearing healthcare professionals, school staff and other professionals. We hope that this book will help to give you a broad, solid base of information about your child's hearing.



Understanding your child's hearing loss

From the moment hearing loss is suspected or diagnosed, your family enters a new world of information and terminology. A clear, thorough understanding of hearing loss - from the function of our hearing system to the different diagnostic tests – will help provide the base for the decisions and adjustments ahead. And this base of understanding can contribute to the best part of all – loving and enjoying your very special child!



THE HEARING SYSTEM

In order to fully understand what hearing loss is, it is necessary to understand the function of the hearing system.

All sound originates from movement. When, for example, the wind blows, it causes the leaves on trees to move. The leaves push the molecules in the air, making them vibrate. These vibrations are called sound waves and can be perceived by the ear. Slow vibrations (low frequency) are heard as deep tones (bass), while fast vibrations (high frequency) are heard as high tones (treble).

The complete hearing system is responsible for our sense of hearing. It picks up acoustic sound waves and transforms them into neural codes, which can be interpreted by the brain. The hearing system consists of three main sections: The outer ear, the middle ear and the inner ear.

The outer ear

The outer ear is made up of the external cartilaginous part of the ear and the ear canal. The eardrum is located at the end of the ear canal, and forms the boundary to the middle ear. The outer ear picks up sound waves and directs the sound to the eardrum. The sound wave pressure causes the eardrum to vibrate and the middle ear comes into action.

The middle ear

The middle ear is filled with air. The eustachian tube, which connects the middle ear to the throat, functions to keep the air pressure in the middle ear equal to the external air pressure. There are three tiny bones in the middle ear cavity; the malleus, the incus, and the stapes, commonly called the hammer, the anvil, and the stirrup. This chain of bones forms a lever mechanism, conducting movements of the eardrum to the fluids of the inner ear. Two small muscles, the stapedius and the tensor tympani, are attached to the bones. These muscles are activated by a reflex when loud sounds reach the ear. This muscle reflex reduces excessive sound pressure before it reaches the inner ear.

The inner ear

The inner ear, or cochlea, is shaped like a snail shell and filled with fluid. The balance organ is attached to the cochlea and is made up of three fluid-filled semicircular canals. The “oval window” connects the middle ear and the inner ear. The base of the stapes is attached to the oval window and functions as a piston moving the fluid of the inner ear.

This movement of the fluid activates the hair cells in the inner ear (there are about 20,000 of these “sensory cells”). When the hair cells are activated, they send impulses via the auditory nerve to the brain, which perceives these impulses as sound.

Via these fantastic, winding ways, the ear is able to pick up sound waves, transform them to bone vibrations, then to wave movements in fluid, and finally to nerve impulses that can be interpreted by the brain. Even the slightest flaw in this complex system can compromise hearing ability.





NORMAL HEARING DEVELOPMENT

It is very difficult to define “normal” development when speaking about human beings. Each individual develops in their own way and at their own pace.

We have compiled a list of some general milestones for hearing development. It is most important to note whether the child progresses naturally through the different developmental stages rather than focusing on reaching a specific milestone by a specific age.

Milestones for hearing development

Prenatal stimulation

The human foetus possesses rudimentary hearing from 20 weeks of gestation. This hearing will develop and mature during the remainder of gestation. The foetus is able to hear sounds outside the mother's body, although it is able to hear low-frequency sounds much better than high-frequency sounds.

0-4 months

Startle to sudden or loud sounds. Begin to localise sounds with eyes or head movements.

3-6 months

Interest in different sounds. Experiment with making own sounds. Seemingly recognise familiar voices.

6-12 months

Babble. Begin to understand simple words such as "mommy" and "bye-bye". Begin to follow simple instructions.

12-18 months

Words begin to form from the babble. Can use around 20 words and understand around 50 words.



➤➤➤ Milestones for hearing development, cont.

2 years

Can usually speak in simple sentences using a vocabulary of around 200-300 words. Enjoy being read to and can identify and name many things in picture books.

3-4 years

Use words and sentences to express needs, questions and feelings. Vocabulary, pronunciation and understanding improve markedly during these years.


HEARING LOSS

When there is damage to any part of the path that sound takes through the hearing system, hearing ability may be compromised.

Only certain types of hearing impairment can be treated with medicine or surgery, while most others will benefit from the use of hearing aids.

Certain factors can influence the impact a hearing loss has on a child's development. A child born with a hearing loss has a greater risk of delayed speech and language development than a child that acquires the hearing loss after speech and language are developed. The degree of loss also has a major impact. A greater degree of hearing loss will usually have a greater effect on the development of speech and language.





It is very important that hearing loss is diagnosed and treated as early as possible. Studies have shown that hearing impaired children can develop speech and language abilities similar to those of normal hearing children, if they are fitted with hearing aids before 6 months of age.

Signs of hearing loss

Children with a hearing loss often learn to compensate for the lack of audible signals by being more sensitive to other informative signals around them such as changes in light as a door is opened or closed, vibrations in the floor, and air movements. Because of this, their responses can seem quite normal, making hearing loss difficult to detect.

Testing a baby's hearing through newborn hearing screening programs is the best way to detect hearing impairment as early as possible. Where hearing screening is not routine, it is quite often the parent that begins to suspect a hearing impairment.

You should trust your intuition if you suspect your child has trouble hearing. If in doubt, make an appointment to see an audiologist or consult your family doctor to arrange a hearing test. A child is never too young to have their hearing tested, and studies have shown that the sooner a child is fitted with hearing aids, the better their language skills can develop.



A hearing test is a simple and painless way to check whether your child is getting the absolute most out of the world around him or her.

We have compiled a list of things in children's behaviour that may indicate hearing difficulties. Children develop at their own individual pace, so while none of these are a sure sign that there is a problem, any of them could indicate that your child is missing important aural information.

Signs of hearing loss

- **Failure to startle** to loud sounds.
- **Inability to locate the source of sounds** by, for example, turning the head towards the person speaking. Children with normal hearing will usually try and locate a sound source by around the age of 5-6 months.
- **Generally requiring louder sound levels** in order to function – sitting too close to the television, turning up the volume, frequently asking “what?” when spoken to, not responding when called.

-
- **Frequent touching or pulling one or both ears** which can indicate pressure or infection in the ear.
 - **Babbling ceases or changes to more high-pitch screaming sounds** at the age of around 6-8 months.
 - **Lack of normal response to sounds** – does not respond to his or her own name by around the age of 6 months.
 - **Failure for babbling to evolve into recognisable speech sounds** and finally to words during the child's second year of life.
 - **Failure to respond** to simple commands such as "Bring daddy the ball" by around the age of 1 year, unless the child is looking directly at you and seeing your body movements.
 - **Withdrawing from social contact** and perhaps "acting out" aggressively. This can indicate frustration over the constant misunderstandings resulting from hearing loss.
 - **Frequently misunderstanding** spoken directions.

Types of hearing loss

Many people associate hearing loss with old age. Although most hearing losses are indeed due to old age, there are many other causes of hearing loss. These include hereditary, pathological (result of disease) and idiopathic (unknown origin) hearing loss. Hearing loss is normally divided into two categories: conductive hearing loss and sensorineural hearing loss, depending on where in the ear the hearing loss originates. A child can also have a mixed hearing loss which is a combination of the two. Knowing the type of hearing loss is necessary in order to provide proper treatment.

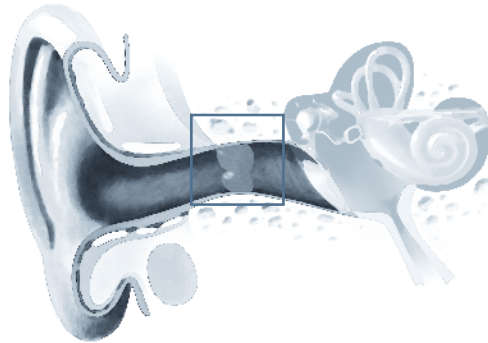
Conductive hearing loss

Conductive hearing loss is a result of sounds being reduced on their way from the outer ear to the inner ear. This may be due to blockages or damaged anatomical structures in the outer ear, ear canal or middle ear.

Sound transmission may be impeded by one or more factors, for example too much or too little pressure in the middle ear may prevent the eardrum from vibrating freely, or stiff or dislocated joints may prevent the middle ear bones from moving freely.

Most conductive hearing losses can be treated with prescription drugs or surgery. However, medical procedures may not fully reverse the conductive loss. Therefore, people with conductive hearing loss can often benefit from a hearing aid.





Common causes of conductive hearing loss in children

Cerumen (earwax) or other debris

The accumulation of debris such as earwax within the ear canal can cause a conductive hearing loss. Debris must be removed by a professional once it has been identified as contributing to hearing loss. Removed without complication, the hearing is typically fully restored.

Middle ear infection (otitis media)

Infection of the middle ear is a common disorder, especially in young children. An acute infection is very painful and should be treated immediately. If treatment is not sought soon enough, a rupture of the eardrum may follow. A healthy eardrum will typically heal itself by closing the rupture with scar tissue. However, an accumulation of scar tissue following many episodes of

infection can cause a conductive hearing loss which may be more difficult to reverse. Chronic infection, another form of otitis, may not be painful, but the inflammation may result in a considerable conductive hearing loss. Infections that are ignored for a prolonged period of time may cause severe complications such as sensorineural hearing loss.

Sensorineural hearing loss

Sensorineural hearing loss is caused by damage to the hair cells of the inner ear (cochlea) and/or nerve fibres conducting nerve impulses from the inner ear to the brain. This type of hearing loss can rarely be reversed by medical or surgical procedures. Sensorineural hearing loss can often be helped with hearing aids.

Common causes of sensorineural hearing loss in children

Congenital

This type of hearing loss implies that your child was born with hearing loss. A congenital hearing loss may be hereditary, stemming from a known or unknown family history. Congenital hearing loss may be a consequence of genetic syndromes (ex: Down's syndrome). Furthermore, these types of hearing loss can arise from factors affecting pregnancy such as alcohol, drugs or medications taken during pregnancy, illnesses contracted by the mother before or during pregnancy or complications during labour.

Acoustic noise trauma

Continual exposure to excessive loud sounds or a brief exposure to sudden impact sounds such as fireworks and cap guns, can cause sensorineural hearing loss.

Infections

Severe cases of certain infections such as measles, mumps, meningitis or whooping cough can lead to various degrees of sensorineural hearing loss.

HEARING TESTS

If you suspect that your child has a hearing loss, or if there are physical or medical conditions of the ear that cause concern, a hearing test can be made.

Children of any age - even newborns - can have their hearing tested. There are a variety of test methods available that are chosen according to your child's age and maturity level. Hearing tests will not cause your child any physical discomfort.

In some countries, hearing tests are performed as a routine part of well-baby care. These tests can help alert parents to hearing difficulties.

An audiologist accustomed to testing adults may not have the necessary equipment to properly assess hearing loss in children. Therefore, it is a good idea to make sure that your audiologist routinely works with children.

The common hearing test, during which the person being tested must indicate whether they can hear a sound, is not usually successful with young children as this method requires reliable responses from the child.



Types of hearing tests

The most common tests used to assess young children

Case history

Hearing healthcare professionals will gather as much information as possible which may assist them in determining the cause of the hearing loss, its possible effects and complications, and the proper management and habilitation strategies. Questions that pertain to such things as family, environment, illness, and pregnancy will be asked. Remember that any information you share will be kept strictly confidential, and will greatly assist the professional.

Otoscopy

An otoscope is a light-emitting instrument that is designed to clearly view the ear canal and eardrum. This instrument can help reveal physical abnormalities that may contribute to hearing loss.

Otoacoustic emissions

This test, which can detect hearing loss without the active participation of your child, is very rapid and in certain areas is often done in the neonatal unit of the hospital shortly after a child's birth. This test measures activity generated by the small hair cells within the inner ear following stimulation by sound. The test is carried out on a calm or sleeping child.

Auditory brainstem response (ABR) and Auditory steady-state response (ASSR)

These tests measure brain waves following stimulation by sound. They are performed without the active participation of your child. It takes somewhat longer than the otoacoustic emission test, but results from these tests can often be useful when providing your child with a hearing aid. Since they are longer tests, you can prepare your child by ensuring that his or her nap time will correspond with your appointment.

Immittance measures

This test records the movement of the eardrum following a change of pressure inside the ear canal. Measures of eardrum mobility and middle ear pressure can be derived in order to assess the integrity of the middle ear. This test is quite helpful in determining the nature of your child's hearing loss and is the test of choice to diagnose middle ear infections.

Immittance measures may also be used to record the acoustic reflex which occurs following the presentation of certain loud sounds. The reflex produces a tightening of the eardrum and is a natural protection against loud sounds. However, when the reflex cannot be triggered or is only triggered by extremely loud sounds, this may signal that certain hearing structures are affected.

Immittance testing is very rapid and does not require the active participation of your child.



➤➤➤ Types of hearing tests, cont.

Audiometry (the common hearing test)

Your child will need to be alert during these types of test since some co-operation and focus is required. Therefore make sure that your child is well-rested and prepared to interact and play with one or two friendly adults during the testing procedure.

Pure-tone audiometry

The purpose of this type of audiometry is to determine the softest volume at which your child is able to hear a variety of brief sounds. These measurements will be useful during the hearing aid fitting process.

During audiometry, sounds will be delivered either through a loudspeaker, headphones or small earphones that fit into the ear canal. Your child will then have the task of indicating when sounds are heard. In very young infants, the child will be led to believe that sound is coming from an animated toy that is placed to the side of the child. Once your child is convinced that sound is produced by the toy (which it is not, the sound is actually produced by an instrument operated by a clinician), the clinician will then produce a sound and wait for your child to turn towards the toy.

In older children, the child is instructed to respond to a sound by completing a part of a game (ex: fit a piece on a puzzle). The child is instructed that only upon having heard a sound can he or she proceed by placing the next piece. The child is then left to proceed and place each additional piece when a sound is heard. Once your child has reached a certain age, he or she can respond as an adult by pressing a button or saying “yes” each time a sound is heard.

Speech audiometry

Older children will be tested using speech audiometry. This task is similar to pure-tone audiometry, but the presented sounds are actual speech. The goal of speech audiometry is to determine the softest level at which your child can detect and recognise speech.

A young child will therefore be expected to turn his or her head towards the animated toy in an identical way as described in the previous section.

An older child will be expected to repeat words or to point to a picture (in a picture book) which illustrates the word. Speech produced at a conversational level will also be presented in order to determine whether speech is properly understood by your child. Once again, the child needs to respond by repeating words or by pointing at a picture which illustrates the word.



THE AUDIOGRAM

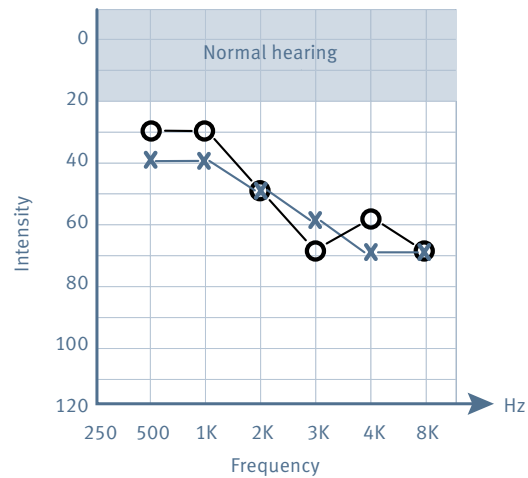
The audiogram is a graphic illustration of results obtained during a hearing test or audiometry.

If your child is older than 6 months of age, a copy of an audiogram should be available to you. If your child is younger than 6 months of age, or if an audiogram could not be obtained because your child was uncooperative during the assessment, it is possible that your physician or audiologist based the diagnosis on results other than the audiogram. In such cases, an audiogram will eventually be made once your child is older or more co-operative.

Always request a copy of the audiogram from your audiologist. This copy should be available to you if you wish to review results at a later date or if you wish to compare it to previous or subsequent audiograms.


Understanding the audiogram

During the hearing test, two parameters - frequency and intensity - are varied in order to determine the softest sounds your child is able to hear.



Frequency

The audiogram is a grid with two scales. The horizontal scale is the "frequency scale". Frequency, which we perceive as pitch, can be described as the different notes on a musical scale.



Frequency is measured in Hertz (abbreviated as Hz). Humans have the ability to hear a wide range of frequencies. In fact, children with normal hearing are able to hear from a very low-frequency sound of 20 Hz (ex: fog horn) to a very high frequency of 20,000 Hz (ex: whistle).


The audiogram shows test results for 6 to 10 frequencies between 250 and 8000 Hz, which are the frequencies that must be heard for development of speech and language. The low frequencies appear on the left side of the grid while the high frequencies appear towards the right side of the grid.

Intensity

The vertical scale is the “intensity scale”. Intensity, which we perceive as loudness, can be described as how loud or soft a sound is. Intensity is measured in decibels (abbreviated as dB or dBHL). This scale shows how “soft” each frequency on the audiogram can be heard. A child with normal hearing should be able to hear each frequency at a level of 20 dB or less.

If the intensity level is higher than 20 dB (appearing more towards the bottom of the grid), this means that the volume of that frequency needed to be raised to this level in order for your child to start hearing, thus indicating a hearing loss at that particular frequency. In sum, each frequency is given an intensity reading.





There are special ways of indicating results for the left and right ears on the audiogram. Readings obtained for the left ear will often be written with blue ink and/or indicated by an "X" while readings obtained for the right ear will often be written with red ink and/or indicated by an "O".

Six degrees of hearing loss

There are typically six degrees of hearing loss which your audiologist will use to describe your child's hearing loss at different frequencies.

Degree of hearing loss	Degree of hearing loss described in decibels (dB)	In terms of verbal communication, this would generally suggest:
Minimal	11 to 25 dB	Few difficulties
Mild	26 to 40 dB	Difficulty hearing faint or distant speech
Moderate	41 to 55 dB	Cannot hear faint speech, difficulty at conversational levels
Moderately severe	56 to 70 dB	Cannot hear faint speech, difficulty at conversational levels
Severe	71 to 90 dB	Cannot hear conversational speech, difficulty with loud speech
Profound	91 dB and over	Cannot hear loud speech, difficulty hearing loud sounds

You should feel free to discuss the audiogram with your audiologist. Ask which sounds (frequencies) and which loudness (intensity) your child is able to hear. This information can give you a good start in understanding your child's unique way of hearing the world around him or her.

THE DIAGNOSIS

The diagnostic process will help to confirm or dispel your suspicions regarding your child's hearing. Following several tests or perhaps several appointments, your audiologist or physician will provide you with the results of your child's tests and a diagnosis.


You will be told of the type of hearing loss (conductive, sensorineural or mixed), degree of hearing loss (from mild to profound) and whether one or both ears are affected.

A prognosis, describing the expected change in the hearing loss over time should also be provided.

It is important to ask your audiologist or physician any questions you may have about hearing loss.

The information you receive at this point will help you determine the best course of action to maximise your child's quality of life.





Although you may have suspected your child's hearing loss, its confirmation typically comes as a shock. Some parents may blame themselves and experience feelings of despair. Others may deny, or be unable to come to terms with, the impairment. These reactions are quite normal. A certain amount of healing and acceptance is therefore required to prepare for the times ahead. Many of these emotions may arise from unanswered questions. The answers to these questions and awareness of the solutions available can be a source of great comfort.

Therefore, talk about it to anyone whom you may feel will shed some light on the subject, or will simply be there to listen to your concerns. Such questions as "Will my child's life be hampered by the hearing loss?", "Will my child speak normally?" are quite typical.

You may wish to talk to your audiologist, physician, other parents or educators or other hearing impaired children, or even individuals who themselves were diagnosed with hearing loss during childhood. Not only can these people help to answer your questions and address your concerns, but their stories may also help give you a positive perspective on the entire matter.

Remember that you are not alone. There are vast resources available to you and your child. Ask your hearing healthcare professional to direct you to organisations for hearing impaired people in your area.



Parenting a child with a hearing loss

Children are born with an open mind. Completely free of prejudice. Totally accepting the world around them. A hearing impaired child has no concept of being “handicapped” unless he or she is made to feel that way.

Humans are incredible at compensating for physical or mental shortcomings. In fact, each and every one of us have something, major or minor, which we work around every day – be it poor vision, a weak constitution or a short temper.

The impressions your child’s family and friends have about hearing impairment can have great influence on your child’s self-image and self-confidence. Your efforts to be well informed, open, supportive and, in general, positive about hearing loss, help your child keep the wonderful open mind and positive attitude he or she was born with.

FIRST STEPS

Parents are most often the first to suspect that their child has a hearing loss. If you have concerns about your child's hearing ability, it is very important to take action right away. Early intervention can have a very positive impact on your child's future. A simple, painless hearing test can confirm or dispel your suspicions, and modern technology can provide comfortable, effective amplification.

But one of the most important things to remember is to continue to play, sing and talk with your child. This loving attention is vital for all children, with or without hearing loss.

First steps

These are some first steps you can take when you begin to suspect that your child has hearing difficulties.

- **Continue to play, sing and talk with your child.**

As with all children, positive human contact is essential for emotional growth and well-being. A hearing impaired child has perhaps an even greater need for close one-on-one contact to lay the groundwork for communication.

- **Look at your child when addressing him or her.**

Your lips, facial expressions and body movements hold important information.

- **Speak in a clear audible voice without shouting.**

Raising your voice too much can distort the sound of your voice making it more difficult to understand.

- **Make sure that there is adequate lighting** when speaking to your child, so the child can see your face clearly.

- **Have your child's hearing evaluated by a hearing healthcare professional** that is experienced in the specific considerations of paediatric audiology and hearing aid fitting.

- **Have your child fitted with hearing aids as soon as possible** to make maximum use of all hearing possibilities. The earlier a child receives the benefits of amplification, the better their chances are for developing good communication skills.

- **Find the resources in your area.** Your family is absolutely not alone in caring for a child with a hearing impairment. Many cities have organisations for hearing impaired people and their families which can offer support and advice, and libraries and bookstores have books which can be helpful.





COMMUNICATION

Exactly what and how your child hears is dependant upon the specifics of his or her unique hearing loss. Ask your hearing healthcare professional to describe your child's hearing loss in terms which help you to communicate as effectively as possible with your child.

In most cases, it will be recommended that you use clear, articulate speech to emphasise certain key sounds which enhance the intelligibility of words and sentences spoken to your child. This will minimise the need for repetition and will greatly facilitate communication with your child.

Speech and language training sessions may further enhance the development of both receptive (hearing) and expressive (talking) forms of speech and language. A specialist in this area will create an enjoyable learning environment for your child where he or she will teach your child to easily recognise and produce certain sounds, words and sentences.

If your child has a severe or profound hearing loss in both ears (a “bilateral” hearing loss), a similar approach in speech and language training may be initiated. Consideration may also be given to supplementing or replacing this training with one or more alternative teaching methods. These may include the use of lip-reading, gestures and expressions, finger spelling or certain signs.



SUPPORT TEAM

As a parent, you are the head of the support team working to help your child get the best possible start in life.

Securing the best care possible takes dedication, energy and determination. The task can be frustrating at times as you sort through information and options, but the victories along the way make it all worth while.

A parent in the support team

Suggestions to help you prepare for your role as a parent in the support team.

Trust your instincts

If you at any time question the advice given by the experts, or feel that you have received inadequate information, or observe that your child's hearing aids are no longer functioning as they were, or if you have any other concerns, seek help. You are the one that knows your child best.

Become informed

The more you learn about hearing impairment and the help available, the better you are able to secure the best possible care for your child. Learn about your child's rights and options and strive

to understand the specifics of your child's hearing loss and the function of the available technology.

Expand the support team

A broad support team is a good base for your child's future. In addition to the professional group consisting of hearing health-care professionals and teachers, you can find great support and resources through organisations, parent groups, publications, etc.

Take care of yourself

In addition to all of the typical demands of raising a child, the special needs of a hearing impaired child can sometimes overwhelm. Before "busy" turns to "stressed" it may be a good idea to take a look at how well you are taking care of yourself.

Patience and pacing will help make any task more manageable, so take things one day at a time, **be realistic** in your expectations and remember to **celebrate the victories**. No accomplishment is too small to be celebrated. But when things are tough, **share your fears and feelings** with family or friends. Their support and understanding can help you see problems or setbacks in a better light. And don't be afraid to **ask for help** when needed. But most important, whenever possible **relax and have fun!**

A happy parent is a wonderful gift for any child.



Other support team components

In addition to the important role of the parent in the ongoing support of a child with a hearing loss, there are several other components which should comprise the support team

Audiology and medical support

It is the hearing healthcare professionals' responsibility to make sure that your child benefits from the latest technology and intervention processes available. Your audiologist should provide your child with frequent hearing assessments and necessary adjustments to the hearing aids. The audiologist should also provide you with the appropriate skills to operate the hearing aid and provide the necessary information pertaining to the management of your child's hearing loss.

Speech and language training

Audiologists and Speech-Language Pathologists can offer various techniques and tools to train and assist your child in developing good speech and language. This training may be available in your child's school or in a private practice. This professional should also instruct you as to the appropriate communication practices in the home and school environments.



School support

If possible, choose your child's school according to the level of support that school can offer students with hearing impairment. Certain teachers may provide special services.


In the following section you will find a school checklist that should be considered when choosing a school for your child. If you cannot choose the school your child will be attending, the checklist can be shown to the school administration in order to help secure any necessary changes to your child's classroom.

SCHOOL

Childhood is the time when life's most important messages are gathered, creating the stepping stones towards adulthood. Every day children are presented with new information. Every day they learn new lessons – whether sitting quietly in a classroom or completely caught up in play.

Your child's teachers are a critical part of the team helping your child on his or her way through life. Children with severe hearing loss will usually attend special schools for hearing impaired children. When possible, many parents prefer that their child attend a regular local school instead of a special school. If your child attends a regular school, it is important to make sure that the teachers are educated as to the unique needs of a hearing impaired child. Once these needs are met, most children will do quite well.





Teachers need to understand the importance of your child's listening environment. In addition to the effect hearing has on education, your child's social and psychological well-being in school can depend on a good listening environment. It is important for a child to be a part of the activities around him or her.

We have compiled a checklist that should be considered when choosing a school for your child.

If you can answer "yes" to most of these questions, your child's school is probably able to provide a good listening environment for your child. Otherwise, it is quite possible that the teachers and the school are not familiar with your child's special needs. By discussing this list with them, you can help them understand the importance of an appropriate listening environment. Many of these points will help children with normal hearing to hear better in class as well!

School checklist

- Do the teachers and staff know enough about hearing loss and hearing aids to assist your child over minor hurdles?
- Are the teachers willing to learn more about hearing loss and hearing aids?
- Are the teachers sensitive and understanding towards your child's hearing loss?
- Are the teachers willing to avoid misunderstandings and prejudice about your child's hearing loss by educating other pupils?
- Is special teaching help available if your child needs extra help with his or her schoolwork?
- Does the school have a policy about teasing? Teasing between children about glasses, weight, hearing aids or whatever should not be tolerated.
- Are FM systems provided and maintained by the school?



➤➤➤ School checklist, continued

- Are the teachers willing to wear an FM system microphone?
- Are the teachers willing to store hearing aid batteries for you?
- Is your child's classroom away from major sources of noise (ex: main school door, busy hallway, street traffic, playground, janitor's shop, furnace room, gym)?
- Is the classroom carpeted to avoid reverberation and unnecessary noise made by chairs and desks?
- If carpeting is not available, can carpet tiles or rubber tips be fitted onto desk and chair legs?

-
- Is your child able to sit in a position at the front of the class in order to see and hear the teacher, and to minimise distractions and optimise interaction with other students (depending on the style of teaching that is used in the classroom)?
 - Is the lighting in the classroom appropriate for lip-reading?
 - Are other pupils discouraged from speaking freely during instruction hours?
 - Can squeaky objects such as doors and desktops be quieted?
 - Are special instructions provided for children with hearing loss in case of fire or other emergencies?





Getting the help your child needs

As a parent, you have the opportunity to be involved in the professional care your child receives. You should expect very open communication with all professionals involved, and you should feel comfortable asking any questions at all and only settle for explanations that are in terms you clearly understand.

The management of a child's hearing loss poses a significant challenge to the hearing healthcare professional. It is an ongoing process that may involve some trial and error in the beginning until the best strategy is found. The final strategy – a combination of amplification type, communication method and training, teaching method, etc. – will be that which gives your child the best sound and the best opportunities for communication and learning. In short, the goal is maximum quality of life. And with the technology and skills available today, you and your child can expect a lot!

Amplification of sounds is your hearing impaired child's key to communication with the hearing world. In order to give your child optimum auditory stimulation, amplification should be implemented soon after diagnosis. Of course, amplification does not reverse the hearing loss, but it enables your child to hear sounds that otherwise would be too soft to hear. There are two forms of amplification:

Hearing aids

The use of hearing aids enables your child to utilise his or her remaining hearing ability in order to optimise the perception of sound. Hearing aids provide amplification and special sound processing to help give your child an optimum representation of sounds that are found in a normal environment.



Cochlear implant

The cochlear implant is a miniature device that enables children with profound hearing loss to perceive sound. The device includes an array of electrodes implanted within the cochlea of the inner ear. The electrodes generate electrical activity that is used to directly stimulate the auditory nerve. The auditory nerve then passes this information along to the hearing centre of the brain.

Because the implant is inserted within the inner ear, the implant inadvertently destroys any remaining sensory cells, or “hair” cells, of the inner ear. However, since children with bilateral profound hearing loss have no or very few inner hair cells, the elimination of these few remaining inner hair cells is warranted by the amount of hearing that will be provided by the cochlear implant. Thus implantation is usually only recommended for children with profound hearing loss in both ears that have shown little prior success with hearing aids. Cochlear implantation can be a good alternative in this situation. The implantation rarely takes place before the child is 18 months old. Candidacy for a cochlear implant is also highly scrutinised.



HEARING AIDS

Fitting children with hearing aids – especially young children – offers a multitude of challenges to the paediatric audiologist. Ongoing changes in physiological characteristics, in psychological maturity, and in language skills require a high degree of flexibility in both audiological procedures and equipment in order to ensure the optimum outcome.

The hearing aid fitting process is very flexible, adaptable and ongoing. Recent technology has expanded the range of hearing aids that are available on the market, and advances in technology have increased the potential for a successful fitting. The choice of hearing aid will depend on characteristics that are unique to your child and his or her environment. Your hearing healthcare professional will advise you regarding the pros and cons of certain hearing aids for your child.

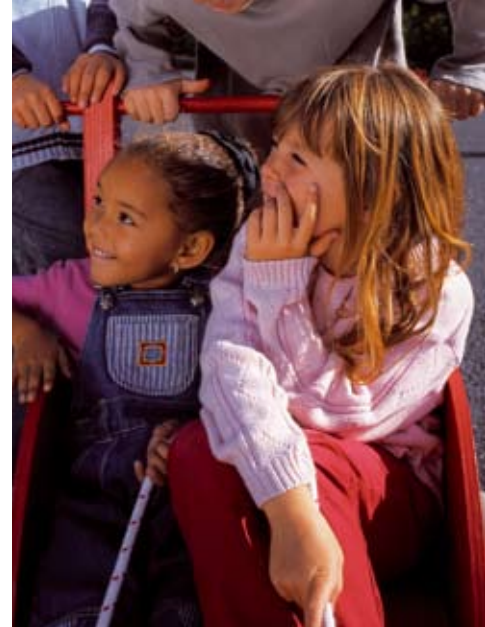
Once hearing aids are provided, success will depend highly on your motivation and perseverance. Your child will need to understand that the hearing aids should be worn as much as possible to ensure optimum interaction and communication. Your positive and encouraging attitude can set a valuable example.

Size

There are many sizes of hearing aids, which vary from a behind-the-ear (BTE) model, where the electronic components are mounted in a compartment which fits behind the ear, to smaller canal models, where the electronic components are mounted in a moulded shell which fits in the ear canal.

Circuitry

There are two types of circuits used for hearing aids. The analogue circuit has been widely available for many years. In recent years, however, digital technology similar to that used to produce the clear sound of a compact disk (CD), has revolutionised the hearing aid industry by greatly increasing the sound quality and fitting flexibility of the hearing aid.



Digital hearing aids

The digital processor found within hearing aids acts as a very complex computer. By using a digital signal, complex calculations can be achieved in short periods of time. Sounds can be manipulated in various ways in order to achieve a high level of sound quality. In addition, digital hearing aids provide innovative features such as fully adaptive directional microphones that make it easier for the hearing aid user to hear speech in noisy environments. The digital hearing aid is highly-adjustable so that it can be fine tuned to suit most hearing needs and provide the user with comfortable sound.

Binaural fitting

If your child has a hearing loss in both ears, hearing aids should be worn on both ears. Amplification in both hearing impaired ears - called a binaural fitting - will help provide better understanding of speech in noisy situations. In addition, a lack of auditory stimulation in the unamplified ear may cause the underlying neural fibres corresponding to that ear to gradually become less functional.

Fitting a hearing aid on an ear that has received little auditory stimulation over a prolonged period of time may not provide additional benefit to the child's overall hearing capabilities.

Colours

Many hearing aids are available in a wide range of bright colours. The reason for this is that, while most adults want their hearing aids to blend in with their skin or hair colour in order to make them less noticeable, most children prefer a bright colour to make their hearing aids cool or pretty. For most children, beige or brown hearing aids are dull.



HOW A HEARING AID WORKS

Your hearing healthcare professional should thoroughly instruct you on the proper operation and maintenance of your child's hearing aids. An initial hands-on introduction to hearing aids is better than many printed illustrations. Do not hesitate to ask questions. Your child depends on your inquisitiveness in order to promote the proper development of his or her speech and language.

Hearing aids are basically small amplifiers contained within a moulded plastic casing. The hearing aid's microphone picks up sounds from the environment and converts them into an electrical signal which is passed on to the hearing aid amplifier. The amplifier is responsible for increasing the volume of sounds. In hearing aids with linear amplification, all sound are amplified equally. With non-linear amplification, the greatest amount of amplification is given to the soft sounds that are typically inaudible to the hearing impaired child, whereas loud sounds receive little or no amplification. Thus, when fitted properly, the non-linear hearing aid helps make soft sounds audible and loud sounds comfortable.

Once amplified, a loudspeaker converts the electrical signal back into an audible signal and delivers it into the ear canal. Some hearing aids have a volume control which can be operated by older children or by an adult. This volume control may be a manual lever or dial on the hearing aid or may be controlled by a remote control. Many modern hearing aids do not have a volume control. The hearing aid automatically adapts the volume to your child's current listening environment.

The hearing aid is programmable, which implies that it can be adjusted individually by your hearing healthcare professional. The professional may need to see the child regularly to make adjustments. This is especially so for young babies. Children will typically be seen every 3-4 months up to the age of about 2 years, then every 6 months up to the age of 5 years and then annually after that. In addition, adjustments can be made upon complaints from the child or parent that the hearing aid may not be performing as expected.



HEARING AID CARE

It is important to read and follow the instructions included with your child's hearing aids. Hearing aids are very intricate, high precision electronic units. They are designed to withstand years of wear under the varying conditions in which your child will find himself or herself each day. However, hearing aids may be damaged if exposed to extreme conditions, severe blows, or general neglect.

To help children to understand and remember how to care for their hearing aids, we have included the ten most important care tips playfully demonstrated by our little friend, "Dexi" the whale. The explanations and guidelines for each tip are intended to give you the basis for explaining them to your child in a way appropriate to his or her age - while you look at the drawings together.

1. Do not drop your hearing aids

Hearing aids can be damaged if they undergo an extreme blow. We recommend that hearing aids are held over a soft surface during cleaning, battery change etc. That way they are less likely to be damaged by the fall if dropped.



2. Do not put the battery in your mouth

Care must be taken so that hearing aid batteries are not accessible to young children who may place them in their mouths. Keep batteries out of children's reach and discard used batteries carefully. Do not change batteries in front of children or let them see where you keep your supply. Tamper resistant battery drawers are available to help keep batteries securely inside the hearing aid. In case of ingestion, contact your physician.



3. Tell an adult as soon as your hearing aids sound different

An adult (parent, teacher etc.) needs to be informed if the child feels that his or her hearing aid sounds different than usual. Then the adult can listen to the hearing aid, through a Widex Listening Set or other protective listening tube, to evaluate whether service or adjustments are necessary.



4. Keep your hearing aids away from dogs

Many dogs will chew on a hearing aid if given the opportunity. Hearing aids should not be left where a dog can reach them.



5. Do not use a hair dryer or hairspray while wearing hearing aids

The extremely high temperature of a hair dryer and the chemicals in hairsprays can damage hearing aids. Hearing aids should be removed before using these things.



6. Do not get your hearing aids wet

The hearing aids should never be exposed to water. They should be removed before bathing, playing in heavy rainfall, or swimming. Also, no water or fluids of any kind should be used to clean the hearing aids. Water can be used to clean the *ear-moulds* when they are disconnected from the hearing aids.



7. Only clean with a clean, dry cloth

The hearing aid should be wiped with a clean, dry cloth after daily use. Do not use fluids of any kind to clean the hearing aid. Water can be used to clean the *earmoulds* when they are disconnected from the hearing aids.



8. Do not expose your hearing aids to extreme heat

Certain materials inside of hearing aids can be affected by extreme heat. To protect from such high temperatures, hearing aids should not be left in direct sunlight on, for example, a windowsill or a car window shelf.



9. Do not try to take hearing aids apart

Despite children's natural curiosity, they should never attempt to "fix" their hearing aids. If there are problems with a hearing aid, return it to the hearing healthcare professional for qualified service.



10. Keep your hearing aids in a safe place when not in use

When not in use, hearing aids should be placed in their storage case and kept in a dry place at room temperature.



ACCESSORIES

There are many different types of accessories available that, by supplementing or working together with hearing aids, can make the life of hearing impaired children easier.

Below, you will find some of the most common types, but accessories can often be tailor-made to individual needs. It would be a good idea to contact a hearing healthcare professional to hear what is available for your child.

Alarm systems

Hearing impaired children can have difficulties in hearing alarms. This problem can be helped by installing special alarm systems.

An alarm system can be connected to a doorbell, telephone bell, alarm clock, smoke detector or the like. The alarm signal is then enhanced with the help of amplification, physical vibration or flashing lights.

Loop systems

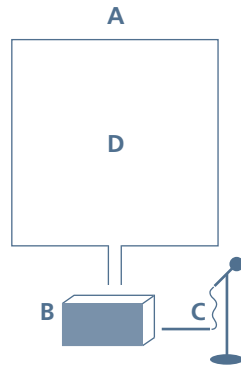
A loop system transfers sound via electromagnetic waves from a transmitter to a receiver. The transmitter could be mounted, for example, on a television and the receiver is typically a hearing aid with a telecoil.

Children with severe hearing loss may benefit from loop systems in difficult listening environments such as theatres and churches. Listening to the TV or radio at home will also be much easier if a loop system is installed and the hearing aid has a telecoil function.

The system is somewhat similar to an FM system, but it is less mobile as it is not completely wireless. Most hearing aids are available with a telecoil.

Loop systems are generally not recommended for classroom use, because if more than one loop system are being used simultaneously in the school, the signal reception can be disturbed.





Loop system:

- A. Induction loop
- B. Amplifier
- C. Microphone
- D. Listening area

Amplifying telephone

Special telephones are available that can amplify sound and make use of the telecoil in the hearing aid, so that your child can keep the hearing aid on when using the telephone.

Hand-held microphone

A hand-held microphone can be used with most behind-the-ear and body-worn hearing aids. It is connected to the hearing aid via a cord attached to an audio shoe. Because the microphone cord is connected to the hearing aid, the microphone must be carried by the hearing aid user.

When the microphone is held towards the person speaking, the speech signal from that direction is heard more clearly than other speech signals. This can be an advantage at parties and in other situations with substantial background noise.



FM (transmitting/receiving) systems

The FM system consists of two basic components - a microphone with an FM radio transmitter and a cordless radio FM receiver.

FM transmitter/receiver systems are often used in the classroom. The system allows the teacher to talk into a microphone that sends the signal by cordless radio transmission to a receiver connected to the student's hearing aid.

With conventional systems, the receiver is connected to an audio shoe on the hearing aid by a cord. In newer systems the receiver is designed as a small adaptor mounted on the hearing aid so that cords are unnecessary.

With an FM system, the virtual distance between the teacher and the child is equal to the distance between the teacher's mouth and the microphone, providing a greatly improved signal-to-noise ratio even in difficult listening situations.





THE WIDEX APPROACH TO PAEDIATRIC HEARING AID FITTINGS

As children grow, their ears undergo continuous physiological changes. Their response to sound matures. Their sound discrimination ability sharpens. When you add to this the various safety, cosmetic and ergonomic considerations, it becomes clear that the requirements of a hearing aid for children are very different from those of adults.

At Widex, we believe that standard paediatric fitting guidelines only satisfy the minimum requirements of hearing impaired children. Because of their developmental needs, additional requirements must be met to ensure consistent audibility of the speech signal, minimal sound distortion, and maximum listening comfort.

In the following pages we will explain some of the challenges in paediatric fittings – and the solutions as offered by Widex digital hearing aids.

Fitting accuracy

The challenge:

Fitting young children with hearing aids can be challenging. Their hearing must be tested using criteria and techniques different from those for older children and adults. Young children are easily distracted and can seldom tolerate long and elaborate testing sessions. Consequently, hearing aids chosen for a child must be adjusted optimally in the least amount of time. In addition, young children usually cannot provide subjective information about the hearing aid fitting. Therefore techniques must be available for hearing aid fitting to children that require the least amount of subjective information from the child.

The efficiency and accuracy of the fitting can be improved if the child's hearing threshold is determined using the child's own hearing aids and earmoulds on the child's ears. This is termed *in situ* threshold measurement.



The solution:

The Widex paediatric fitting rationale ensures that the individual properties of the child's hearing loss are considered during the fitting procedure. This fitting procedure, designed for children, ensures the delivery of an accurate amount of amplification from the hearing instrument in various listening situations.

Several Widex digital instruments are fit utilizing the unique *Sensogram* in-situ fitting strategy. When performing a Sensogram, the hearing instrument is placed in the child's ears and his/her hearing thresholds at three frequency channels are determined. In essence, the hearing aid is used as an audiometer. The advantage of this approach is that the acoustic properties at the eardrum are exactly the same during the fitting procedure as they are with normal hearing aid use. This method allows for very accurate and effective amplification settings.

Flexible electroacoustics

The challenge:

As a child grows from birth to 5 years of age, their ear also grows. The ear canal lengthens and this has an impact on the hearing aid fitting both from the point of view of amplification needs and the requirement for new earmoulds. Furthermore, middle ear infection could result in a fluctuating conductive hearing loss in children. These changes created by the growing ear canal and any possible fluctuations in hearing levels suggest that the initial hearing aid settings may no longer be appropriate after a period of use and the hearing aid will need to be reprogrammed.

In order to accommodate these changes in threshold and physiology, the hearing aid must have flexible electroacoustic settings as well as a fitting strategy that allows for quick and precise (re) fittings.



The solution:

Widex digital instruments allow the amplification for soft, medium and loud input to be adjusted in several channels over a very wide range. As a consequence, these hearing aids can be fitted to a wide variety of hearing losses. Furthermore, the initial settings can be updated or reprogrammed as many times as necessary.

Changing listening environments

The challenge:

Children are active by nature and in their everyday life they are exposed to many different listening environments. Sometimes they listen to soft speech sitting on their mother's lap, sometimes they want to hear other children shouting on the playground. Because of the difference in distance and the source of the sound, the sounds reaching their hearing aids will have different intensity. With linear-type hearing aids that provide the same amplification at all sound input levels, some of these sounds may be too soft to hear while others may be uncomfortably loud.

A volume control or multiple programs can help compensate for the differences in sound levels in various listening environments. Unfortunately, they require that the children (and/or parents) physically operate the volume control or program switch at the appropriate times. This may be impractical for many children and their parents.

The solution:

A hearing aid that automatically adjusts its amplification for different sound input levels can provide the correct amplification in all daily listening environments. This is achieved by the use of a compression system that takes the full range of sounds in the daily listening environment and fits them into the narrow hearing range of the hearing impaired child. The compression algorithms used in Widex digital instruments is an example of such advanced compression systems.

A Widex digital instrument takes into account the changes in the sound levels in the child's listening environment. It adjusts its signal processing so that soft sounds are heard as soft sounds and loud sounds are heard as loud sounds but are not too loud. The advantage for children is that this is accurately achieved without the need for manual volume control adjustment or program switches. This is especially important for the young child who may have difficulty managing a volume control.



Audibility of soft sounds

The challenge:

Hearing loss results in the inability to hear soft sounds. In children, this can delay normal speech and language development. Consequently, a hearing aid must provide enough gain to ensure audibility of even the softest speech sounds.

To achieve audibility of the softest speech sounds, one needs a compression circuit with a low compression threshold (CT). The lower the compression threshold, the greater the amplification to soft sounds becomes. Unfortunately, this is difficult to achieve with analogue technology due to problems with stability, feedback, and circuit noise within the hearing aid.

The solution:

The use of digital signal processing (DSP) techniques allow Widex engineers to achieve a low CT at 20 dB HL or below in most Widex digital hearing aids. To minimise internal hearing aid noise, a unique circuit noise reduction system limits the level of the circuit noise below the wearer's hearing threshold, so the hearing aid sounds quiet at all times. Hearing aid wearers can hear soft speech sounds without audible circuit noise and discomfort at high input levels.

It has been verified in clinical studies that offering optimum audibility for all speech sounds early in life ensures better speech and language development.

Preserving temporal cues

The challenge:

The way in which the speech signal changes over time (temporal cues), helps listeners to identify speech sounds and thereby understand their meaning. In general, young children need more cues than older children and adults in order to identify speech sounds. It is therefore important that signal processing used for very young children with hearing loss preserves even the subtle differences in the sound input in order to allow easier identification.

Several hearing aid types are able to follow the rapid changes in the speech input. While this fast speed is beneficial to ensure audibility and comfort, it reduces temporal cues available within the speech signal and could make speech understanding more difficult, especially for children with more severe hearing loss.

The solution:

Widex digital hearing aids process the speech input more slowly, ensuring audibility and comfort while permitting the listener to perceive the temporal cues of speech. This mechanism promotes the child's identification of speech and understanding of speech.

Advanced Widex instruments also employ another mechanism, the Sound Stabilizer™. This mechanism examines the intensity relationships of the input signals to ensure that the temporal cues of speech are still audible even when preceded by loud sounds. Therefore, speech remains audible and comfortable in a variety of listening situations.



Optimising the signal-to-noise ratio

The challenge:

The signal-to-noise ratio (SNR) is the relative difference between a sound of interest (signal) and background noise. The higher the SNR the more audible speech in noise will be. People with hearing loss need a more favourable SNR than normal-hearing people to achieve the same degree of speech understanding. This is even more the case for children than for adults.

Children's primary communication environments are typically noisy (classrooms, playgrounds, etc.). Because children's language skills are less developed than adults', they cannot as easily "fill in" the unheard parts of a verbal message in order to understand its intent. Consequently, ensuring audibility at a favourable SNR is particularly important to hearing impaired children's hearing ability and speech and language development.

The solution:

Hearing aids with directional microphones can improve the signal-to-noise ratio of the listening environments. By reducing the hearing aid's sensitivity to sounds from the sides and the back, a Widex directional hearing aid makes listening and understanding in noise easier.

The fully adaptive directionality of some advanced Widex instruments should be considered as an optimum solution for listening in noise. Since the position of noise sources changes over time, the fully adaptive directional microphone system should also adapt over time in order to continuously allow an optimum SNR. The adaptive directional system will actively identify whether noise sources are competing with spoken language and then track the noise source in order to effectively cancel it.

Several Widex hearing instruments also feature a unique advanced noise reduction/speech enhancement algorithm. This system monitors the input in each frequency band to determine whether the signal is predominantly "speech" or predominately "noise." It then automatically adjusts the signal processing so that listening comfort in noise is improved. At the same time, when "speech" is detected the hearing aid will automatically adjust the processing in order to enhance speech.



Minimizing the occurrence of feedback

The challenge:

Acoustic feedback or whistling can occur as a result of the hearing aid not fitting tightly in the child's ear, or when the hearing aid comes into close contact, or is covered by, objects such as a hat. The occurrence of feedback will often cause the parent or child to have the volume of the hearing aid turned down. This reduction in volume will prevent the child from receiving enough amplification from the hearing aid and therefore prevent the child from hearing soft speech and soft sounds.

The solution:

A hearing aid that can effectively cancel acoustic feedback will provide the correct amount of amplification for the child to understand speech and sound. Widex adaptive feedback cancelling systems can effectively determine whether acoustic feedback is being generated and immediately cancel it without causing a reduction in volume. In this way the child can consistently hear the soft speech and soft environmental sounds.

Monitoring of voice

The challenge:

Children with hearing loss often cannot hear the intricacies of their own voices. This can affect their speech production and cause the child to have a voice quality that is difficult to understand. For this reason, the child may hesitate to communicate with others, which may further decelerate the child's speech and language development.

The solution:

Multi-channel hearing instruments can provide appropriate amplification so the child can clearly hear the various characteristics of their voice as well as that of others. A clinical study has shown a significant drop in the number of vocal errors when the child's own hearing aid was substituted with a Widex multi-channel hearing instrument.

All Widex digital instruments are multi-channel. Combined with the digital signal processing and low CT, these instruments provide an optimum solution to monitoring of one's own voice.



The Widex Paediatric Partnership

At Widex we believe that early intervention, utilising the exciting technical advantages available with digital technology, offers children with hearing loss an excellent start to a lifetime of learning, giving, and experiencing – through all five senses. We will therefore continue to commit significant resources to developing hearing instruments and professional expertise that can help children realise their maximum potential.

The combined efforts and dedication of parents, hearing healthcare professionals and Widex in helping children hear better form the Widex Paediatric Partnership.

Widex website

Additional information about hearing, hearing aids and much more can be found at the comprehensive Widex website, www.widex.com.

Under the heading “Children” you will also find a special playground just for children, *Fun with Dexi*. Here, Dexi the whale leads children on a hunt for sunken treasure, tells them about hearing and about orca whales, and lets them direct their own adventure movie in Dexi’s film studio.

As with other Widex Paediatric Partnership resources, the intention of this website is to help make hearing aids a comfortable and natural part of the everyday life of hearing impaired children and their families. It is hoped that children will proudly show friends “their” website, *Fun with Dexi*, and through laughs and games replace stigma with acceptance and understanding.





We offer you a wealth of information
at www.widex.com

ENGLISH ■ GERMAN ■ FRENCH ■ SPANISH ■ DANISH

Children - Widex@ site on hearing loss, hearing, digital hearing aids and quality of life - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Refresh Print Mail Downloads Language

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- Hearing loss
- Children
 - Learn about hearing loss
 - Parenting
 - Getting help
 - WHISPER

A child's hearing loss affects the entire family

From the moment hearing loss is suspected or diagnosed, your family enters a new world of information and terminology.

A clear, thorough understanding of hearing loss will help provide the base for the decisions and adjustments ahead.

In the following pages you can read about early signs of hearing loss, about school and communication, and about how you, as a parent of a child with hearing loss, can help your child with the practical and emotional issues surrounding hearing loss.

Early identification is important

→ [Understanding your child's hearing loss](#)

Human beings have five senses through which we experience our world. A child is born with a mind that is open and ready to receive information through these senses. The more information the mind receives, the better the child can understand and participate in the world around them. The senses are our tools for learning and participating in the world around them.

Acknowledgement can be difficult

→ [Parenting a child with a hearing loss](#)

The realisation that a child has a hearing loss can be overwhelming to a parent. There is so much information to take in, and so many questions to be asked and decisions to be made. And in addition to all of these practical concerns, there can be many emotional issues.

The important role of the support team

→ [Support](#)

→ [Fun with Dexi](#)

Visit our site for children and play with Dexi – the playful little whale.

ENCYCLOPEDIA

Widex encyclopedia provides you with a broad and solid base of information about: sound and hearing, hearing loss, hearing aids as well as feelings and prejudices.

→ [A colourful world](#)

Widex hearing aids are available in many bright colours - making hearing aids more fun and cool for children and teenagers.

→ [A great help in everyday life](#)

SCOLA The SCOLA FM Association

