

A-Z of hearing loss

All you need to know about hearing loss in children.

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THERE are 360 million people with disabling hearing loss worldwide and 32 million of them are children.

Despite the staggering statistic, not many people know about hearing loss in general, or in children, to be specific.

There are many aspects of hearing loss in children that can be explored. Here is a list from A to Z about childhood hearing loss in a nutshell.

A: Aural habilitation

Aural rehabilitation is a term referring to teaching hearing-impaired people to adjust or compensate for their hearing loss using spoken communication skills.

Babies or young children with hearing loss do not have the skills to begin with.

Hence, habilitation, rather than rehabilitation, is more apt, whereby the children require intensive training in learning to listen using hearing devices, as guided by their audiologist and speech-language therapist.

One of the earliest sounds they will hear are their caregivers' voices and sounds at home.

They will first learn to pay attention to these sounds, and then attach meanings to these sounds, which subsequently leads to their development of spoken language.

B: Brain plasticity

The brain is able to reorganise its neural pathways whenever new information or memory is received. This process is called the neuroplasticity of the brain, and it takes place throughout a lifetime. However, different types of plasticity are more dominant at certain periods of life.

The central auditory system is the part of the brain that is responsible for hearing and speech, and is highly dependent on exposure to sounds early on in life.

In fact, the period from birth to three years is the critical window for auditory development and language learning.

Research has shown that without sound stimulation, the central auditory system does not develop normally, which is a risk for hearing-impaired children if they do not receive early intervention.

This consequently leads to speech and language delay. Therefore, consistent sound and listening stimulation during this critical period is important for the development of speech and language.

C: Causes of hearing loss

The causes of hearing loss can be congenital or acquired.

Congenital means the hearing loss is present at, or acquired soon after, birth.

Causes may be infections during pregnancy (e.g. maternal rubella [German measles], cytomegalovirus, herpes simplex virus and syphilis; prematurity; low birth weight [less than 1.5kg]; birth asphyxia [lack of oxygen at the time of birth]; birth injuries; and use of certain drugs during pregnancy (e.g. aminoglycosides, cytotoxic drugs and diuretics).

Acquired hearing loss is hearing loss that is present after birth, at any time of an individual's life.

Among its causes are infectious diseases (e.g. meningitis, measles and mumps); chronic ear infections; wax or foreign bodies blocking the ear canal; fluid in the ear (otitis media); use of certain medication (e.g. for the treatment of neonatal infections, cancers); injury to the head or ear; excessive noise; and ageing.

D: Developmental checklist

Like physical developmental milestones, a

child's hearing and talking development can also be tracked using a typical hearing and talking developmental checklist.

By monitoring the child's progress according to that checklist, it should serve as a reference for parents and caregivers on signs that they need to look out for in their children.

Visits to the paediatrician or maternal and child healthcare providers are important as these professionals can advise you whether your child is at an appropriate developmental rate.

E: Early detection and intervention

The earlier the detection of hearing loss, the earlier the intervention process can start for the child.

Research has shown that children with hearing losses identified by six months of age, who received amplification and habilitation services, have significantly better language development.

Early detection and intervention are critical for the development of speech, language and communication skills in children with hearing loss. The term "wait and see" does not apply when it comes to hearing loss in children.

F: Family support

When a child is diagnosed with hearing loss, the whole family is affected.

Each parent will react and respond differently to the diagnosis and it is really important that they are supported in this challenging journey.

It is not easy, but it really does help to share the diagnosis with extended family members, and even friends. Do not forget about the other children (the siblings) as well, they too have feelings and needs.

Family support helps to deal with the situation better. In fact, the family-centred approach is the ideal approach when it comes to managing families with hearing impaired children.

G: Genetics

Another cause of hearing loss is through hereditary factors, where the hearing loss may be present at birth or develop later in life. It is believed that genetic factors cause more than 50% of all hearing loss.

Generally, genetic hearing loss is autosomal recessive, where both parents carry the gene that causes hearing loss in their child.

Genetic hearing loss can also be autosomal dominant, where only one parent having the gene is enough for the child to have hearing loss.

Among the genetic syndromes in which hearing loss is a symptom are Down Syndrome, Usher Syndrome, Treacher Collins Syndrome, Crouzon Syndrome, Alport Syndrome and Waardenburg Syndrome.

H: Hearing devices

If hearing loss cannot be treated medically or surgically, hearing devices can help to improve the ability to hear.

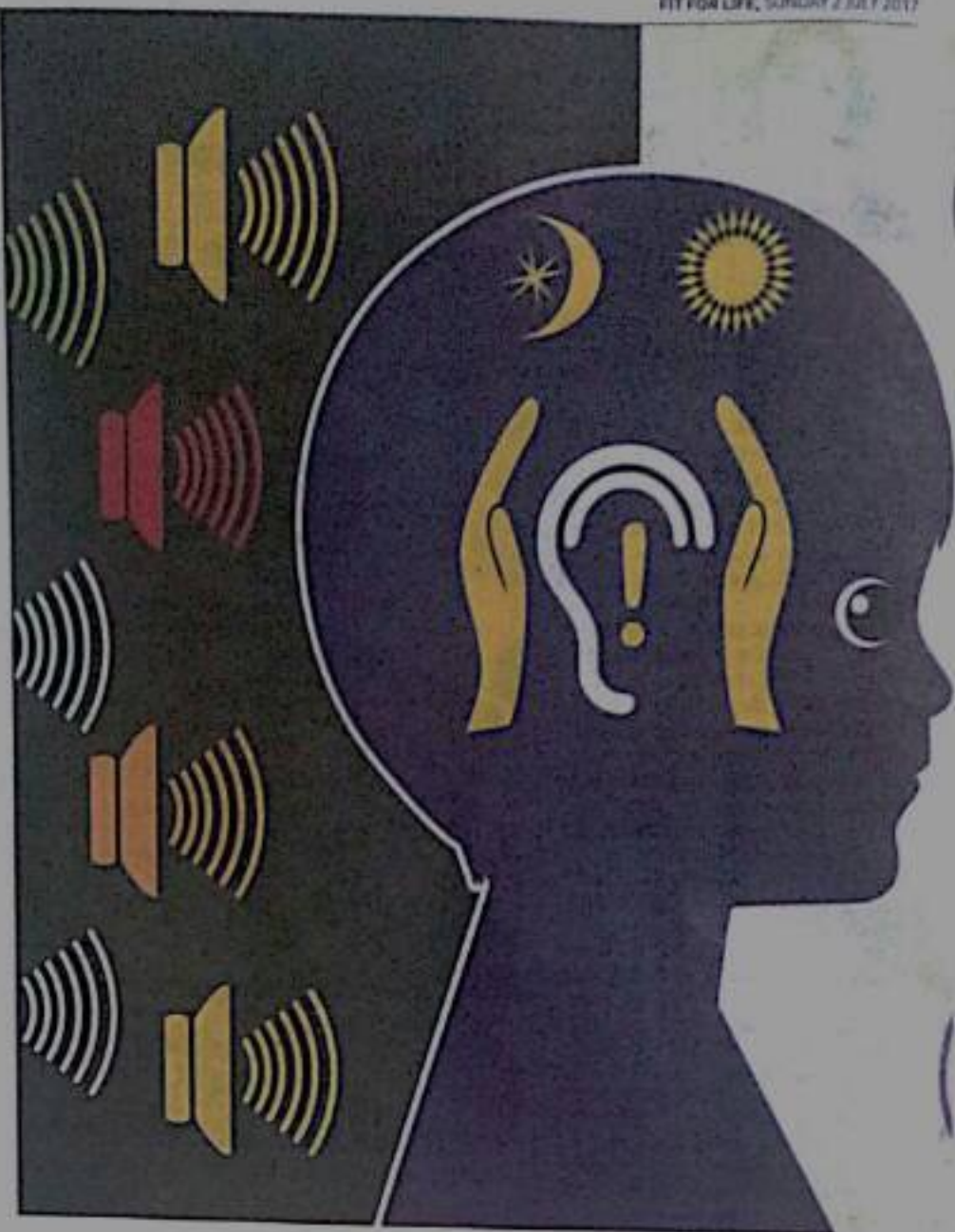
Hearing devices include hearing aids, cochlear implants and assistive listening devices such as the FM system.

A hearing aid is a small, electronic device that amplifies sounds. Hearing aids are programmed specifically to a person's hearing loss.

When a child has a significant hearing loss and does not benefit from the hearing aids, a cochlear implant is considered.

A cochlear implant is a device inserted surgically, to provide direct stimulation to the auditory nerve.

There are certain criteria to be met before



a person can undergo cochlear implant. A team of specialists including otologists, audiologists and speech-language pathologists will meet to decide on a person's suitability for a cochlear implant.

Assistive listening devices are usually recommended for particular listening environments, such as in a class room or meeting room.

The assistive device helps the hearing aid/cochlear implant user to better hear the speaker, rather than the surrounding environmental noise.

However, hearing devices are not meant to cure the hearing loss.

Once the device is turned off or runs out of battery, the wearer will still have deafness and be unable to hear.

I: Impact of hearing loss

Hearing loss in children, if unaddressed, can have significant impact on a child's life, such as delayed language development and poor academic performance.

Hearing loss will affect a child's ability to communicate with others, causing feelings of loneliness, isolation, and even frustration.

In addition, the World Health Organization estimates that unaddressed hearing loss could cost up to an estimate of US\$750bil (RM3 224bil) per year globally.

This includes health sector costs (excluding the cost of hearing devices), costs of educational support, loss of productivity and societal costs.

Thus, it is really important to have interventions that can minimise the impact of hearing loss.

J: Jaundice

Hyperbilirubinaemia or jaundice is also one of the causes of hearing loss at birth.

Very high levels of bilirubin in a newborn's blood will cause the bilirubin to cross over the thin layer of tissues between the brain and the blood (the blood-brain barrier).

The bilirubin can damage the brain (including the part related to hearing) of a newborn infant.

The severity of hearing loss can vary from mild to significant and permanent hearing loss in the baby.

Hence, the treatment of jaundice cannot be taken lightly and bilirubin levels in babies who have jaundice need to be monitored.

K: Klinik Audiologi dan Sains Pertuturan (KASP), Universiti Kebangsaan Malaysia (UKM)

KASP offers a wide range of audiological and speech therapy services to the public, from newborns to adults.

It is also a teaching facility for audiology and speech-language pathology students.

Services include diagnostic audiological assessments, vestibular assessments, tinnitus clinic, aural (re)habilitation, auditory processing assessments, cochlear implant clinic (run by UKM Cochlear Implant Team), as well as speech and language assessments and therapy.

Ear, Nose and Throat (ENT) specialist clinics are also available. To access either one of these services a referral letter is required and an appointment has to be made.

L: Listening hierarchy

Learning to listen is not automatic. There are four stages in the listening hierarchy a child has to go through to develop listening skills.

The first is detection - when the child needs to hear the presence or absence of sound. The child should be introduced to many new sound experiences every day so that he/she knows that the world is noisy, yet full of interesting sounds.

Next is discrimination - the child needs to know whether the sounds heard are the same or different.

This is followed by identification - the child should correctly repeat what is heard, or understand what each sound means.

The final stage is comprehension - the child is able to understand connected speech using hearing alone, such as following directions, asking and answering questions, and participating in conversations.

Even if a child has reached the level of comprehension, sometimes, a revisit to detection, discrimination and identification is still required.

This is just an overview of what the listening hierarchy is like.

M: Mainstream school

With the provision of early diagnosis and early intervention, it is possible for a hearing-impaired child to be able to learn to lis-