



income countries have inadequately trained primary ear and hearing care personnel. Additionally, inadequate budgets for healthcare, fragmented healthcare systems, and a lack of political will in most of these countries, make it impractical and challenging to bring awareness, early detection, and intervention that may prevent permanent hearing loss. Some examples like ototoxic medicines and noise exposure can cause disabling hearing impairments but are avoidable, which makes awareness imperative. Improved awareness campaigns and use of noise-protection devices can reduce noise-induced hearing loss^{2,3}.

Thinking Globally, Acting Locally: The WFA[®] Community-based Hearing Healthcare Model

By: Tani Austin, BC-HIS; H. William Noël, III, BC-HIS; and Alfred Mwamba, AuD

*In an effort to provide access to lower to middle-income countries, the Starkey Hearing Foundation (SHF) developed a simple, sustainable, and scalable program that benefits people with hearing loss around the world who do not have access to primary ear and hearing care services. This article describes the SHF approach to solving the global hearing healthcare problem. Although THP would rarely have an article discussing a process from just one manufacturer's vantage point, we are pleased to present this unique process to readers from the Starkey Hearing Foundation founder, who is a pioneer in the field of hearing health missions to disadvantaged communities. **Read this Continuing Education article and take the quiz on page 67.***

Opportunities to Help

Over 90 percent of the burden of chronic ear infections is borne in countries in South-East Asia, Western Pacific and African regions, and by ethnic minorities in the Pacific Rim². Chronic otitis media, a leading cause of hearing loss is largely manageable through medical resources and surgical procedures.

The State of Global Hearing Healthcare

Approximately 360 million people (5% of the world's population) worldwide live with disabling hearing loss¹. A disabling hearing loss is characterized by a loss greater than 40 dB in adults and greater than 30 dB in children. Most of these hearing-impaired people live in countries where little to no access

to hearing healthcare exists.

The World Health Organization (WHO) suggests that 50% of hearing impairment can be prevented and awareness, early detection, and intervention techniques are essential² to accomplish this. The problem is that most of the lower-to-middle

It has been documented that hearing impairment or deafness in childhood often delays speech development, social interactions, and cognitive skills². About one third of people 65 and over develop age-related hearing loss. This can cause the feeling of loneliness and isolation and negatively impact socio-economic status. This aging population continues to grow in all regions mentioned above².

The Traditional Approach

The traditional method of audiological assessment helps us understand the degree and type of hearing loss. The softest sound a person can hear is measured by air conduction. Then it needs to be determined how the cochlea is hearing tones by thresholds through the mastoid bone. This helps assess if the hearing loss is sensorineural (nerve damage) or conductive (biological / medical reason) or a combination of the two called a “mixed” hearing loss.

A subjective measure is used to determine what is most comfortable for a level of speech and for understanding speech. A similar subjective measurement is used to understand what they perceive to be “uncomfortably” loud. The patient is then asked to respond by repeating words that may or may not be in their immediate vocabulary memory because of the severity of hearing impairment. This is recorded as their word discrimination; their ability to recognize and repeat words. All of these measures give the hearing aid specialist a subjective perspective on how the patient responds to a stimulus.

This battery of audiological measurements gives a detailed picture of the hearing loss a person is experiencing. These tests describe the problem of the patient to help develop an understanding of the problem and the solution. When fitting a patient with a hearing instrument, the focus of the hearing aid specialist is on **audibility, binaural balance, and loudness control**.

From the beginning days of dispensing hearing aids, the profession has

evolved from using subjective measures to objective measures, or a combination of both, for fitting and validating hearing instrument fittings. Custom air-tubed ear molds made it easy to switch to different behind-the-ear hearing instruments for the patient to try. Hearing instrument fittings were viewed as successful based on how well the patient responded to hearing with a specific hearing instrument.

be hearing. RECD measurements are deemed a gold standard in fitting validation by the American Academy of Audiology.

Audiologists and hearing aid specialists agree that they ultimately measure fitting success by subjective measures. They use the audiogram as a picture of the hearing problem, then fine tune the patient experience

WHO Facts on Deafness and Hearing Loss*

- 360 million people worldwide have disabling hearing loss, and 32 million of these are children.
- Hearing loss may result from genetic causes, complications at birth, certain infectious diseases, chronic ear infections, the use of particular drugs, exposure to excessive noise, and aging.
- 60% of childhood hearing loss is due to preventable causes.
- 1.1 billion young people (aged between 12–35 years) are at risk of hearing loss due to exposure to noise in recreational settings.
- Unaddressed hearing loss poses an annual global cost of 750 billion international dollars. Interventions to prevent, identify and address hearing loss are cost-effective and can bring great benefit to individuals.
- People with hearing loss benefit from early identification; use of hearing aids, cochlear implants and other assistive devices; captioning and sign language; and other forms of educational and social support.

*From www.who.int/mediacentre/factsheets/fs300/en

Different types of amplification were tried and the patient chose the one that gave them the best response.

With the advent of custom-hearing instruments, prescriptive methods were used to validate fittings based on formulas because multiple custom hearing instruments for one patient would prove non-cost-effective for manufacturers. When a patient is not able to respond verbally about how they are hearing, RECD (Real Ear Coupler Difference) measurement is an option. Objective measurements entail predicting how the patient should

be based on their expertise and a subjective response. Order forms pour into hearing aid manufacturers missing key elements for designing the best hearing solution, so designed matrices are ball-parked or defined by audiologists’ or hearing specialists’ specific requests. The hearing specialist then asks patients how they are hearing and adjusts from the manufacturers’ “best fit.” Subjective outcomes have become the gold standard to which most hearing aid benefit results are compared⁷.

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WHO Facts on Causes of Hearing Loss and Deafness*

The causes of hearing loss and deafness can be divided into congenital causes and acquired causes.

Congenital causes

Congenital causes may lead to hearing loss being present at or acquired soon after birth. Hearing loss can be caused by hereditary and non-hereditary genetic factors or by certain complications during pregnancy and childbirth, including:

- maternal rubella, syphilis or certain other infections during pregnancy;
- low birth weight;
- birth asphyxia (a lack of oxygen at the time of birth);
- inappropriate use of particular drugs during pregnancy, such as aminoglycosides, cytotoxic drugs, antimalarial drugs, and diuretics;
- severe jaundice in the neonatal period, which can damage the hearing nerve in a newborn infant.

Acquired causes

Acquired causes may lead to hearing loss at any age, such as:

- infectious diseases including meningitis, measles and mumps;
- chronic ear infections;
- collection of fluid in the ear (otitis media);
- use of certain medicines, such as those used in the treatment of neonatal infections, malaria, drug-resistant tuberculosis, and cancers;
- injury to the head or ear;
- excessive noise, including occupational noise such as that from machinery and explosions;
- recreational exposure to loud sounds such as that from use of personal audio devices at high volumes and for prolonged periods of time and regular attendance at concerts, nightclubs, bars and sporting events;
- aging, in particular due to degeneration of sensory cells; and
- wax or foreign bodies blocking the ear canal.

Among children, chronic otitis media is a common cause of hearing loss.

*From www.who.int/mediacentre/factsheets/fs300/en

Demystify the Approach

Due to the enormous public health problem of hearing healthcare in low and middle-income countries that have challenges in tackling them, the Starkey Hearing Foundation (SHF) created a scalable program to serve the needs of low-to-middle income populations who have little-to-no access to primary ear and hearing healthcare.

The foundation has provided hearing instruments to people with hearing loss in developing countries for many years. The initial focus was on providing hearing aids and fitting individuals with hearing loss. Founders, William F. Austin and Tani Austin, recognized the need to do more to bring about lasting changes, so they have developed, utilize and promote an effective approach for

community-based hearing healthcare⁵ to date. This model accomplishes the goals of the WHO Primary Ear and Hearing Care Training Initiative⁶. The four-phase model provides primary ear and hearing care with the delivery of the hearing solution—hearing instruments. It is simple, sustainable, and scalable.

This method is simple to learn so that local citizens of developing countries can be taught the WFA® Fitting Method and help their own citizens. Currently, 94.4 % of the foundation's personnel live in the regions where they work, over 1000 people have been trained on the WFA® Community-Based Hearing Healthcare method and 51 countries use the method in Africa, Asia, and Latin America.

SHF Approach

Created and developed by William F. Austin, the WFA® Fitting Method stands for and is registered as Wide Frequency Audibility—WFA®. The method is based on modification of Raymond Carhart's comparative fitting approach that engages the patient in the fitting process to ensure a successful outcome.

The WFA® approach has been refined to facilitate use within any culture, language and test environment. This method ensures effectiveness by providing behavioral verification along the following parameters:

- Step one: *Audibility and Comfort*
- Step two: *Prevention of loudness discomfort, and*
- Step three: *Binaural balance.*

Phase 1. Patient Identification and Screening

Phase 1 consists of identifying and

training partners and community-based health workers. This includes identifying, screening, and providing primary ear-care services to hearing aid candidates; as well as taking ear impressions; creating ear molds; scheduling the phase 2 mission.

Phase 2. The WFA® Fitting Method Hearing Mission

Phase 2 consists of providing hearing devices and custom ear molds to qualified hearing aid patients using WFA® Fitting Method. This involves:

- counseling and training patients, family members, and teachers on caring for and operating hearing devices;
- providing aftercare information and resources to patients on where to go and who to contact for follow-up services; and
- training community-based teams to execute ongoing programs.

Phase 3. Aftercare Services

Phase 3 is a unique component of the model. It consists of:

- ongoing monthly aftercare services;
- giving patients access to additional care including counseling, batteries, and free services to repair or replace hearing aids when needed;
- monitoring and evaluating program and team;
- providing ongoing education for the program team and community-based healthcare workers;
- identifying new hearing aid candidates for future missions; and
- collecting data.

Phase 4. Mainstreaming Opportunities

Phase 4 is comprised of:

- providing self-empowerment tools

to become self-determining;

- equipping people with skills and resources to incorporate into life;
- employing speech-language pathologists who visit schools and provide additional care; and
- tracking progress in assimilation, listening, speech, and language in education classes and home.

Benefits of Model

The foundation simplified their model to provide opportunities for many people across the world to hear and to develop communication skills through auditory-verbal means⁵. The WFA® Community-Based Hearing Healthcare

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WHO Facts on Hearing Loss and Prevention*

Overall, it is suggested that half of all cases of hearing loss can be prevented through public health measures. In children under 15 years of age, 60% of hearing loss is attributable to preventable causes. This figure is higher in low- and middle-income countries (75%) as compared to high-income countries (49%). Overall, preventable causes of childhood hearing loss include:

- infections such as mumps, measles, rubella, meningitis, cytomegalovirus infections, and chronic otitis media (31%);
- complications at the time of birth, such as birth asphyxia, low birth weight, prematurity, and jaundice (17%);
- use of ototoxic medicines in expecting mothers and babies (4%); and
- others (8%).

Some simple strategies for prevention of hearing loss include:

- immunizing children against childhood diseases, including measles, meningitis, rubella and mumps;
- immunizing adolescent girls and women of reproductive age against rubella before pregnancy;
- preventing cytomegalovirus infections in expectant mothers through good hygiene;
- screening for and treating syphilis in pregnant women;
- strengthening maternal and child health programs;
- following healthy ear care practices;
- screening of children for otitis media, followed by appropriate medical or surgical interventions;
- avoiding the use of particular drugs which may be harmful to hearing, unless prescribed and monitored by a qualified physician;
- referring infants at high risk for early assessment of hearing, to ensure prompt diagnosis and appropriate management, as required;
- reducing occupational and recreational exposure to loud sounds by raising awareness about the risks; and
- encouraging individuals to use personal protective devices such as earplugs and noise-cancelling earphones and headphones.

*From www.who.int/mediacentre/factsheets/fs300/en

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program provides WHO level-3 training that includes basic training for primary caregivers, intermediate training for local providers, and advance training for professionals with higher-level training. This program is highly suited for bringing training resources to developing countries.

Data collected from people fit by the Foundation with the WFA® Fitting Method indicated that a large majority (greater than 85%) are very satisfied with the hearing benefits they have been receiving. Summarily, the SHF through its WFA® Community-Based Hearing Healthcare model continue to champion a simple, sustainable, and scalable community-based hearing healthcare approach as a supplementary alternative to solving the global hearing healthcare problem. ■

WFA®
is a registered trademark
of the Starkey Hearing
Foundation

**Take the Continuing
Education Quiz on
page 67.**

Biographies

Tani Austin, BC-HIS, has more than 30 years of experience in the hearing industry, including: maintaining her own hearing aid practice for 10 years and serving as a proctor for Illinois Department of Public Health Practicum Examination for hearing aid dispensing, Secretary of the Illinois Hearing Society, and on the National Board of Certification in Hearing Sciences. Participating in dozens of hearing missions every year, Tani has visited over 100 countries to provide hearing aids and hearing care.

H. William Noël, III, BC-HIS, is Nationally Board Certified in Hearing Instrument Sciences. He holds a license to dispense hearing instruments in California and Minnesota. William has been working in the hearing industry for 38 years. He has held leading industry positions in manufacturing, sales and education, and training. He has been coaching trainee hearing specialists for the last 12 years in preparing for their licensure exams. Currently works in the Center for Excellence, Starkey Hearing Technologies Premier Fitting Clinic. Here he uses skilled arts and sciences to fit hearing instruments. Noel provides support for education and training for the Starkey Hearing Foundation.

Alfred Mwamba, AuD, is the only certified audiologist in Zambia, practicing at Beit Cure Hospital, and Program Director of the Trinity Institute of Health and Sciences and Technology. Currently the Director for the Starkey Hearing Institute established in Zambia in 2016.

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IHS Continuing Education Test

Thinking Globally, Acting Locally—article on page 42

1. Infections such as mumps, measles, rubella, meningitis, and chronic otitis media are non-preventable causes of childhood hearing loss.
 - a. True
 - b. False
2. Acquired causes of hearing loss include
 - a. low birth weight
 - b. severe jaundice in the neonatal period
 - c. injury to a person's head or ear
 - d. birth asphyxia
3. Globally, about ___% of people 65 years and older develop age-related hearing loss.
 - a. 40
 - b. 50
 - c. 60
 - d. None of the above
4. Approximately 3% of the world's population lives with disabling hearing loss.
 - a. True
 - b. False
5. Since the inception of hearing aid fitting, professionals have.
 - a. evolved from using subjective to objective measures.
 - b. evolved from using objective to subjective measures.
 - c. used a combination of subjective and objective measures.
 - d. A and c
 - e. B and c
6. On a global basis, 50% of hearing impairment can be prevented by
 - a. hearing health awareness.
 - b. early detection of hearing.
 - c. intervention techniques.
 - d. All of the above
7. ___ young people (aged 12 to 35 years old) from all around the world are at risk of hearing loss due to exposure to noise in recreational settings.
 - a. 11 million
 - b. 100 million
 - c. 1 billion
 - d. 1.1 billion
8. A disabling hearing loss in adults is characterized by a loss greater than
 - a. 25 dB.
 - b. 30 dB.
 - c. 35 dB.
 - d. 40 dB.
9. Counseling and training patients on caring for and operating hearing devices occurs in this phase of the WFA Fitting Method.
 - a. Phase 1
 - b. Phase 2
 - c. Phase 3
 - d. Phase 4
10. Congenital causes of hearing loss include
 - a. low birth weight.
 - b. recreational exposure to loud sounds.
 - c. foreign bodies blocking the ear canal.
 - d. otitis media (collection of fluid in the ear).

For continuing education credit, complete this test and send the answer section to:

International Hearing Society • 16880 Middlebelt Rd., Ste. 4 • Livonia, MI 48154

- After your test has been graded, you will receive a certificate of completion.
- All questions regarding the examination must be in writing and directed to IHS.
- Credit: IHS designates this professional development activity for one (1) continuing education credit.
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THINKING GLOBALLY, ACTING LOCALLY

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Answer Section

(Circle the correct response from the test questions above.)

1. a b

2. a b c d

3. a b c d

4. a b

5. a b c d e

6. a b c d

7. a b c d

8. a b c d

9. a b c d

10. a b c d