



MICHIGAN DEPARTMENT OF HEALTH & HUMAN SERVICES  
Division of Child and Adolescent Health

## HEARING SCREENING PROGRAM

An Explanation to Physicians

All Local Health Departments in Michigan conduct annual hearing screenings as required by law. School-age, pre-school, and special education children are screened at regular intervals by extensively trained Local Health Department hearing screening technicians.

The hearing screening is performed in two stages; the preliminary screening (Stage I) is performed at 1000, 2000 and 4000 Hz at 20, 20, and, 25 dB HL, respectively. Children who do not pass the preliminary screening will receive a second screening approximately 4 weeks later (Stage II), which includes an intermediate sweep and/or audiogram. The intermediate sweep is a more extensive screening. If *any* of the sounds presented are not heard, it is immediately stopped, and an air and bone conduction audiogram is completed.

When the results of the audiogram indicate the existence of a possible hearing problem, parents are notified and urged to take their child to their physician, **or** they may be invited to attend a free Local Health Department Otology Clinic (Stage III). At the Otology Clinic, an otologist and audiologist will examine the child free of charge and provide a diagnosis, treatment, and recommendations. Following medical intervention, the outcome is shared with the child's primary care provider.

Most hearing losses identified in this program are mild to moderate in degree and can be treated medically or surgically. Some children may have a permanent, sensorineural hearing loss, that requires extensive otologic, audiologic, and educational intervention.

DEGREES OF HEARING LOSS	
-10 dB HL to 25 dB HL	Normal Hearing Range
26 dB HL to 40 dB HL	Mild Hearing Loss
41 dB HL to 55 dB HL	Moderate Hearing Loss
56 dB HL to 70 dB HL	Moderately Severe Hearing Loss
71 dB HL to 90 dB HL	Severe Hearing Loss
91 dB HL +	Profound Hearing Loss

The MDHHS Hearing Screening Program is unique because bone conduction is included as a standard protocol during the audiogram. Bone conduction thresholds are obtained at the following frequencies: 250, 500, 1000, 2000, and 4000 Hertz. **Research has shown that children with bone conduction better than air conduction can have clinical symptoms even when air conduction is within normal range.**

Local Health Department hearing technicians utilize the following **referral criterion** to determine when medical intervention is necessary:

1. **Air Conduction:** A child is referred to Stage III if TWO frequencies of the same ear are worse than the following intensity levels:

<u>250 Hz</u>	<u>500 Hz</u>	<u>1000 Hz</u>	<u>2000 Hz</u>	<u>4000 Hz</u>	<u>8000 Hz</u>
30 dB HL	25 dB HL	20 dB HL	15 dB HL	25 dB HL	40 dB HL

2. **Air/Bone Gap:** A child is referred to Stage III when bone conduction thresholds are better than the better ear air conduction thresholds by at least the differences indicated:

<u>250 Hz</u>	<u>500 Hz</u>	<u>1000 Hz</u>
15dB	15dB	10dB

3. **Difference Between Ears:** A child is referred to Stage III when the *pure tone average* for each ear at 500 Hz, 1000 Hz, and 2000 Hz differs by 10dB or more. The technician considers this method only when the child's thresholds do not meet the first two criteria.
4. **History:** Technicians may occasionally encounter results that do not meet the above referral criteria exactly, but a concern remains. A change in threshold along with other factors (history of ear problems, a variation in threshold, parent, or teacher concern) would qualify as reason enough to make a referral. These factors can be used in combination with the referral criteria or in isolation.

This brief explanation may not answer all questions relative to the MDHHS Hearing Screening Program. If you have additional questions or concerns, please contact Jennifer Dakers, MDHHS Hearing Program Consultant at [dakersj@michigan.gov](mailto:dakersj@michigan.gov).



## EXPLANATION OF THE AUDIOGRAM

The Michigan Department of Community Health and your Local Health Department (LHD) work together to provide hearing screening services throughout Michigan. Some children will receive a “screening” and those who don’t pass the “screening” will have an audiogram. **Below is a sample audiogram.** The numbers in the boxes represent a passing threshold level according to the State guidelines. **A threshold is the softest level a person is able to hear and is measured in decibels. Your child should hear somewhere within the range shown in each box.**

### SAMPLE AUDIOGRAM

		Frequencies in Hertz					
		250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
RIGHT EAR	AC	30dB or less	25dB or less	20dB or less	15dB or less	25dB or less	40dB or less
	BC MASKED						
UNMASKED BC		*	*	*	*	*	
LEFT EAR	AC	30dB or less	25dB or less	20dB or less	15dB or less	25dB or less	40dB or less
	BC MASKED						

- ❖ Air Conduction (AC) – the method of finding the softest level a person can hear (the threshold) while wearing headphones. Measured in decibels, ex. 20dB HL, 55dB HL
- ❖ Bone Conduction (unmasked BC) – the method of finding thresholds with a bone conduction oscillator placed behind the ear on the mastoid bone; sound is sent to the inner ear by vibrating the bones in the head.  
\*bone conduction referrals are determined by comparing AC & Unmasked BC
- ❖ Bone Conduction Masked (BC Masked) – a diagnostic measure utilized by audiologists who may participate in Otolology Clinics hosted by the Local Health Department.
- ❖ Frequency – relates to the pitch of a sound. For example, 250 Hertz (Hz) and 500 Hz are low frequency sounds and 4000 Hz and 8000 Hz are high frequency sounds.
- ❖ Decibels – a measure of intensity or loudness. For example, 20dB is softer than 50dB

MDCH Referral Criteria:

- Air Conduction-the child’s responses were outside the “normal” range (levels indicated above)
- Air/Bone Gap-a difference between the air & bone conduction results may indicate a problem in the outer or middle ear
- Difference Between Ears-the child’s hearing is better in one ear than the other, which may indicate a problem

### PARENTS NEXT STEPS

1. If your child did not pass their audiogram, please contact your physician for an appointment.
2. Take the paperwork provided to you by the Local Health Department (LHD) to an Ear, Nose and Throat specialist or your physician; have him/her complete the diagnosis, treatment and recommendations and mail or fax the results back to the LHD.
3. All children who are referred to the doctor will automatically be re-checked the following year in school by the Hearing Screening Program.

Rev. 6/3/14

# AUDIOGRAM OF FAMILIAR SOUNDS

