



## **Guidelines for Audiometric Baseline Revision**

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As indicated by regulations, revision of a baseline audiogram may be warranted and is permitted when there is persistent shift or significant improvement in audiometric thresholds. Pertaining to these regulations, the NHCA recommends the following guidelines, meant to be employed by a professional supervisor (i.e.: licensed audiologist or physician), with the goal of fostering consistency among professional reviewers of audiometric data from occupational hearing conservation programs. As required by federal regulations, the final decision regarding audiometric baseline revision is the responsibility of the professional supervisor; however, the guidelines may be used by the occupational hearing conservationist, or within data-processing software, to assist in the identification of records for potential revision. The professional supervisor should be prepared to justify any deviations from these guidelines.

The baseline is the first audiogram obtained upon entry into the hearing conservation program. This test may be a pre-placement audiogram. In the event that there are two audiograms performed within the first twelve months, the professional supervisor will determine which audiogram will serve as the reference baseline for all subsequent review. Each annual audiogram will be compared to the reference baseline to detect significant improvement or Standard Threshold Shift (STS). An STS is defined as an average change for the worse of 10 dB or greater at 2000, 3000, and 4000 Hz, relative to the baseline. Age correction may be applied unless prohibited by individual state regulation. The test results for the two ears are examined separately and if one ear meets the criteria for revision, the baseline is revised for that ear only.

### **Revision for Persistent Improvement**

If the thresholds for 2000, 3000, and 4000 Hz for either ear on an annual test show an average improvement of 5dB or more compared to the baseline, and the improvement is persistent on the next test occurring at least six months later, then the record should be identified for review by the professional supervisor for potential baseline revision for persistent improvement. In the ear/s showing persistent improvement, the baseline for that ear/s should be revised to the test which shows the lower (more sensitive) value for the average of thresholds at 2000, 3000, and 4000 Hz. If both tests show the same numerical value for the three-frequency average, then the professional supervisor should revise the baseline to the earlier of the two tests. This protocol should be followed, unless the professional supervisor determines a specific reason/s for not revising, or for using a test other than that with the more sensitive thresholds for the

revised baseline.

### **Revision for Persistent OSHA Standard Threshold Shift**

If thresholds for either ear show an STS and the STS persists on a subsequent annual test (or the next test given at least six months later), then the record should be identified for review by the professional supervisor for potential baseline revision because of persistent worsening. In the ear/s showing persistent STS, the baseline for that ear/s should be revised to the test which shows the lower (more sensitive) value for the average of thresholds at 2000, 3000, and 4000 Hz. If both tests show the same numerical value for the three-frequency average, then the professional supervisor should revise the baseline to the earlier of the two tests. This protocol should be followed, unless the professional supervisor determines a specific reason/s for not revising, or for using a test other than that with the more sensitive thresholds for the revised baseline.

Following an STS, a retest may be conducted within 30 days of the annual test and may be substituted for the annual test if the retest shows better (more sensitive) results for the average threshold at 2000, 3000, and 4000 Hz. If a retest confirms the STS shown on the annual test, the baseline will not be revised at that point because the required six-month interval demonstrating persistent STS has not elapsed. The purpose of the six-month requirement is to prevent premature baseline revision when STS is the result of a temporary medical condition or other event affecting hearing.

All cases of STS must have appropriate follow-up as detailed in the regulations. After identifying an STS, the professional supervisor must further determine whether or not recording/reporting criteria have been met.

### **Other considerations for baseline revision:**

**Age Correction:** Baseline revision is effectively impacted by the application of Age Correction Tables F-1 (males) and F-2 (females) as presented in the Hearing Conservation Amendment to the OSHA Noise Standard (29 CFR 1910.95). The procedure and the age correction tables were developed by the National Institute for Occupational Safety and Health in the 1972 criteria document entitled "Criteria for a Recommended Standard...Occupational Exposure to Noise," ((HSM)-1101). Two diverse strategies have evolved pertaining to including or excluding age correction when calculating an STS.

Excluding age correction when calculating an STS will ultimately recognize average changes in hearing threshold levels at 2000, 3000, and 4000 Hz more quickly than when age correction is applied. As such, calculating STS without age correction is recognized as a best practice guideline. Furthermore, some state OSHA plans (e.g. Washington) do not permit age correction in calculating an STS for this reason.

In contrast, age correction may be recognized as a viable and permissible tool to account for cumulative environmental noise exposure. Therefore, federal OSHA and most state plans permit age correction in calculating an STS.

Unless prohibited by individual state OSHA plans, the feasibility of age correction must be weighed by each professional reviewer.

**Break in Employment:** A baseline should not be revised based solely on a break in employment. The first test following return to work should be entered and analyzed as an annual audiogram. If there is no STS, continue annual testing. If an STS is present, and shown to be persistent by a subsequent audiogram, the professional supervisor should review all audiometric tests prior to the break and consider any potential exposures or other events occurring during the break in employment. Based on this review, the professional supervisor should then make the decision whether baseline revision is warranted.

**Sale of Company:** A change in company ownership does not trigger baseline revision. When a business changes ownership and either remains at the same location or relocates and retains the current employees, the former employer is required to transfer all audiograms including baselines to the new employer. "Retaining current employees" includes those employees released/terminated, then immediately rehired at the time of sale. If a business moves to a different location (even out of state), and the same employees are retained, then the employer must transfer the audiograms to the new location. However, if the business changes ownership and hires new employees, then under these circumstances, the new business would have to establish baselines for the newly hired employees.

Initial guidelines approved by the Executive Council on February 24, 1996 (<http://www.hearingconservation.org/associations/10915/files/GuidelinesforAudiometricBaselineRevision.pdf>).

Updated guidelines edited and approved by the Executive Council on February 20, 2013.