

T K GROUP, INC.  
NEWSLETTER  
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VOLUME 21 ISSUE 1

Please Don't Miss the Forest for the Trees

The original intent of requiring identification of a 10 dB Standard Threshold Shift (STS) as mandated by 29 CFR 1910.95 (The Occupational Noise Standard) was and remains two-fold:

1. **A 10 dB STS may be an early indicator of noise-induced etiology for which actionable intervention (e.g. mandated use of hearing protection, review of engineering controls, administrative controls, etc.) is activated.**
2. **A 10 dB STS may suggest underlying pathology.**

For many safety supervisors, performance review and salary structure is directly tied to Recordable (log) activity; resultantly the retesting of 10 dB STS

events often receives lesser priority and is overlooked.

While potential Recordable events should indeed be retested, do not lose sight of the fact that *the issue of Recordability is a political, legal, and recordkeeping compliance issue and not the vehicle to rely upon to make early identification of noise-induced hearing loss.*

T K Group suggests that all 10 dB STS events be retested not only to be proactive but also because many confirmed 10 dB shift patterns point to potential underlying pathology in need of timely (medical) referral.

This author recently fielded a telephone call from a client who had recently received a visit from an OSHA inspector. The OSHA inspector suggested to the client that Individual

Test Summaries (i.e. hearing threshold levels) included too much information-specifically that only the thresholds at 2000, 3000, and 4000 Hz needed to be presented and reviewed. T K Group provides complete audiometric review as mandated in CFR 1910.05 (g)(7)(iii) to state: "The audiologist, otolaryngologist, or physician shall review problem audiograms and shall determine whether there is a need for further evaluation".

Audiologic dysfunction (whether occupationally related or not), is not limited to the 2000, 3000, and 4000 Hz frequency range.



Age Correction a Customary Service

T K Group frequently receives calls during or after an OSHA inspection asking the question "Do the values shown on the Individual

Summary reflect age corrected analysis?" Answer: "No".

The Individual Summary simply lists the results of a

pure tone air conduction test yielding hearing threshold levels at each test frequency.

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*"...the issue of Recordability is a political, legal, and recordkeeping compliance issue and not the vehicle to rely upon to make early identification of noise-induced hearing loss."*

1987 - 2007

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YEARS OF EXCELLENCE

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### Age Correction a Customary Service (continued from Page 1)

Once thresholds are obtained, all data undergoes an age corrected analysis (unless otherwise requested or allowed pursuant to specific State mandate) to identify shift activity. Age corrected shift activity is reported on the 10 dB STS Listing and/or the Potential Recordable Listings. Unless otherwise requested, Individual Summaries do not reveal comparison averaging.



Customer No.: SEE\_DP-999

Bogus Database  
Rockford, IL 61101

JOHNSON, JOHN J  
Emp. No. 00012345

Test Results for 9/12/1991 test

**Individual Summary**

For Period from: 09/12/91

Dept.: LAB Job: SUPV Shift: 1 Noise Exp: \$5.00  
Clock Id: Birth Date: 02/21/59 Hire Date: 08/29/89 Gender: M

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3/15/2007

10dB STS Result:		Left* No		Right* No		Medical Referral:	N	Repeat Condition:	N
Recordable Result:		Left* No		Right* No		Reasons:			

Med Ref. Issues:	Prin:	Drainage:	Dizziness:	Ringing:	Sudden Loss:	Frost Loss:	Fulness:
Diseases:	Mumps:	Mastitis:	Scarlet Fever:	Meningitis:	Diabetes:	Kidney Dis.:	
Conditions:	Cold:	Allergies:	Head Injury:	Drugs:	Family Loss:	Protect. Prob.:	
Environment:	Gas:	Milroy:	Noisy Hobby:	Lead Status:	High Noise:	Protect. Used:	
Medical:	Surgery:	Sea MD:	Hearing Aid:	How: B = both ears, E = either or both ears, L = left ear, N = neither ear; R = right ear; Y = yes; -/blank = unavailable			
Otoscopy:	Dona:	Bilaga:	Drainage:	Other:			

Date	Time	THRESHOLDS						10dB STS		RECORDABLE		MEDICAL REFERRAL			
		LEFT			RIGHT			Left*	Right*	Left*	Right*	Ref	BL		
09/12/91	00:00	10	10	10	15	15	15	10	10						
09/10/90	00:00	10	10	10	15	10	10	10	10						
09/20/89	00:00	10	10	15	10	10	10	10	10	Y	Y				Y

Key: -/blank = No Change Y: new STS or Recordable C: Confirming R: Repealing F: Refused X: Rejected  
 P: Persistent NP: Non-Persistent I: Improvement PI: Persistent Improvement  
 Medical Referral Key: Rep. = Repeat Condition

### Commonly Observed Clinic-Based Test Discrepancies

Historically and with regular frequency, T K Group observes difficulties with audiograms conducted at ENT (Ear, Nose, and Throat) and Audiology clinics. The most common testing discrepancies are:

**Failure To Test 3000 and 6000 Hz:** Many clinic providers fail to provide hearing threshold levels at 3000 and 6000 Hz. This oversight is understandable since historically, clinically-based ENT (Ear, Nose, and Throat) and Audiologist practices obtained hearing threshold levels at the octave intervals (i.e. 500, 1000, 2000, 4000, and 8000 Hz) only.

Secondly, many practitioners are not familiar with OSHA test requirements necessitating threshold determination at 3000 Hz, vital to making 10 dB and Recordable shift analyses.

**Omission of 8000 Hz:** OSHA does not require testing at 8000 Hz, however T K Group does. Without 8000 Hz documentation, a determination of noise-induced versus non-noise induced etiology is very difficult and in some cases impossible; additionally, 8K omissions provide less defense against cases that in reality are not consistent with noise induced etiology but cannot be proven to the contrary

due to the historical exclusion of 8000 Hz.

**Masking:** Use of masking in clinical test batteries is a common clinical procedure whereby “narrow band” noise is introduced to the “non-test” ear when determining threshold in the “test” ear. Masking is performed clinically when there is a significant difference in thresholds between ears. Given a sufficiently intense test (tone) signal, that signal may “cross over” by bone-conduction to the non-test ear and fool both the patient and the clinician into thinking that the “test” ear was the ear responding to the signal. By providing masking to the non-test

ear, that ear is effectively removed from test participation so that valid thresholds may be obtained on the test ear.

Certain clinical circumstances may preclude the need to record air conduction thresholds. However, “masked” hearing threshold levels are of little use and impractical in occupational surveillance applications.

**Bone Conduction:** When circumstances warrant, recording of bone conduction thresholds may exclude the need to record air conduction thresholds, clinically; however, use of bone conduction thresholds

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Commonly Observed Clinic-Based Test Discrepancies (continued from Page 2)

is not allowed in OSHA analyses.

**Screening Audiometers:** Practitioners often use a portable or handheld screening device that presents test signals at one intensity level for all test frequencies. A telltale sign of a screening test may be apparent when all test frequencies possess the same hearing threshold level (e.g. 20, 20, 20, 20, 20, 20, 20, 20). A screening evaluation is not a valid, reliable, or accepted hearing test for OSHA compliance.

**The Lazy, Untrained, or Corrupt Technician:**

Yes, we see these too. While often not dissimilar in appearance to the aforementioned use of screening equipment (e.g. 15 15 15 15 15/15 15 15 15 15 15), experience and investigational savvy allows us to differentiate between fabricated data “strings” having identical threshold values for one or both ears and use of screening equipment. Barring use of screening equipment, identical data strings point to purposeful data fabrication, invalid manual threshold determination techniques, and/or inadequate (training) preparation. When setting up a clinic audiogram, please make

certain to request that a pure tone air conduction test be administered to include 500, 1000, 2000, 3000, 4000, 6000, and 8000 Hz, bilaterally.

The attending clinician most certainly retains the right and remains within accepted levels of professional efficacy to document masked air conduction, unmasked bone, and masked bone conduction thresholds; however, T K Group can only process pure tone air conduction threshold measures.



**New Information on Impulse Noise**

Impulse noise is a long recognized sole or combined contributor to noise induced cochlear damage. A common noise spectrum in occupational settings, impulse noise comprises high intensity, short duration bursts of energy (e.g. gunfire, metal stamping, etc).

Intuitively, many might think that exposure (measured in sound pressure level) to impulse noise within a confined space is far more damaging than the identical exposure level in an unconfined (open) space. Maybe not.

Auditory Physiologist Richard Price, a consultant at Auditory Hazard Analysis in Charlestown, Md., recently studied the risk of hearing loss posed by automobile airbag deployments.

Contrary to what many suspected, Price suggests that airbag deployment within the passenger area of cars with a “windows open” condition is far less damaging than deployment with the “windows closed” condition. These findings are likely related to a physiological process called the Acoustical Stapedial Reflex (ASR).

Audiologists have long known of an ear related physiological function called the Acoustical Stapedial Reflex (ASR). The ASR is activated by the contraction of the stapedial muscle which is connected to the stapes (bone), one of three bones which comprise the Ossicular Chain. The ASR activates in response to sudden, intense sound directed to the

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**ATTENTION!**

In an effort that we provide this newsletter electronically as well as to inform you of immediate professional announcements, please email us your email address to:

[robertwilliams@tkontheweb.com](mailto:robertwilliams@tkontheweb.com)

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## New Information on Impulse Noise (continued from Page 3)

to the ear(s). The ASR is nature's way of damping potentially damaging acoustical energy served to the hearing mechanisms. The ASR and subsequent stapedial contraction increases the impedance capability of the Ossicular chain, thus protecting the hearing mechanism against sudden, intense, and damaging noise.

Price's findings suggest that "thanks" to the ASR, "windows closed" airbag deployment results in less cochlear damage than a "windows open" condition because the energy released after airbag deployment in the "windows closed" is sufficiently intense to activate the ASR, which in turn affords greater protection against the noise. The "windows open" condition provides an environment less favorable to ASR activation, thus leaving the ear(s) more exposed to damaging noise levels given that no or less protection is provided by the ASR.

The message perhaps to be taken from this study is less the concern that airbags cause hearing loss, but rather the need to rethink the effects of impulse noise in all occupational and non-occupational settings. Given the choice most persons would likely choose hearing loss over debilitating injury or worse death. The real message to take from this study's initial findings is that Industrial Audiologists, Acoustical Engineers, and other related safety professionals might need to seriously rethink and better respect the potential effects of impulse noise in all types of industrial settings. While the results of this study cannot be applied to all environmental circumstances, perhaps future studies may suggest the need to direct and implement engineering controls in favor of confined spaces to best prevent noise induced damage due to impulse energy.



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**T K Group is conducting a CAOHC Certification and Recertification course on July 18th, 19th, and 20th 2007. If you wish to participate, please contact Beth Minnick at (815) 964-5445**