Now Hear This . . .

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NOISE AND BLOOD PRESSURE

We previously reviewed the association of noise with elevations in blood pressure in the Spring, 2004 Vol. 7, No. 1 issue of *Now Hear This*. A review article published in 2002 cited 43 published studies and concluded that for each 5-decibel increase in occupational noise exposure there was a .51 mm Hg (95% CI - .01 – 1.00) increase in systolic blood pressure and a 14% increase in the occurrence of hypertension (1). Although the emphasis of our surveillance program is on the health effects from exposure to *noise at work,* there is extensive literature on increases in blood pressure from exposure to *environmental noise from living near roads or airports*.

Table I summarizes 10 recent studies that found an association between noise and elevated blood pressure (seven from environmental and three from occupational exposures to noise). The studies can be grouped into two types: (1) relatively small groups of individuals (20-140) who have their blood pressure measured using 24-hour ambulatory equipment and the short term effects on blood pressure are analyzed in relationship to noise levels; and (2) large groups of individuals (623-40, 856) exposed to noise are assessed over years for the prevalence or incidence of hypertension or change in blood pressure measurements over time. **(See Page 2 for Table I.)**

The data consistently show short-term changes with acute noise exposure as well as a long-term increase in blood pressure or the prevalence of hypertension. A number of studies only showed the risk in men (7, 8) and some only showed a risk in middle-aged individuals (10, 11). One occupational study showed an increase in blood pressure with noise exposure even if the individuals were provided hearing protection (5).

The more recent data since our 2004 review strengthens the evidence for an association between noise and an adverse effect on blood pressure. The risk of non-auditory effects from noise exposure increases the importance of controlling and reducing noise exposures not only to reduce the occurrence of hearing loss but also to reduce the occurrence of negative, systemic, non-auditory health effects.

Table I. Summary of Recent Studies Finding a Significant Association Between Noise and Increase in Blood Pressure or Physician-Diagnosed Hypertension

Study	Source of Noise	Number of Subjects	Results
PANEL STUDY— 24 HR. AMBULATORY BLOOD PRESSURE			
Chang et al, 2009 (2)	*Environmental*	60	Among 18-32 year olds 5 dBA increase in 24-hour average noise 1.15 mm Hg systolic and 1.27 mm Hg diastolic increase
Haralabidis et al, 2008 (3)	*Environmental* Airports, Aircraft and Roads	140	6.2 mm Hg systolic and 7.4 mm Hg diastolic increase in response to aircraft events
Chang et al, 2007 (4)	*Occupational* Auto Manufacturing	20	≥85 dBA increased systemic vascular resistance
COHORT STUDY			
Lee et al, 2009 (5)	*Occupational* Metal Manufacturing	530	>85 dBA used muffs and ear plugs 3.8 mm higher systolic <85 dBA used muffs or ear plugs 2.0 mm higher systolic Intermittent noise, no hearing protection 1.7 mm higher systolic All results compared to office workers <60 dBA
Sbihi et al, 2008 (6)	*Occupational* Sawmill	10,872	Hypertension increased >85 dBA especially among longer duration workers
Barregard et al, 2009 (7)	*Environmental* Road and Train	1,953	Hypertension increased 1.9 times if 56-70 dBA 3.8 times if 56-70 dBA among men, not women
Belojevic et al, 2008 (8)	*Environmental* Road	2,503	Hypertension increased 1.6 times if levels by road >45 dBA at night for men, not women
Rhee et al, 2008 (9)	*Environmental* Helicopter or Fighter Air Base	623	Hypertension increased 1.6 times for helicopter but not fighter noise
Jarup et al, 2008 (10)	*Environmental* Airports, Aircraft and Roads	4861 (45-70 yr.)	Hypertension increased among men and women 1.14 times for 10 dBA increase in night-time aircraft or road noise For men alone 1.5 times increase
Kluizenaar et al, 2007 (11)	*Environmental* Road	40,856	Hypertension increased 1.39 for 45-55 year olds from road noise

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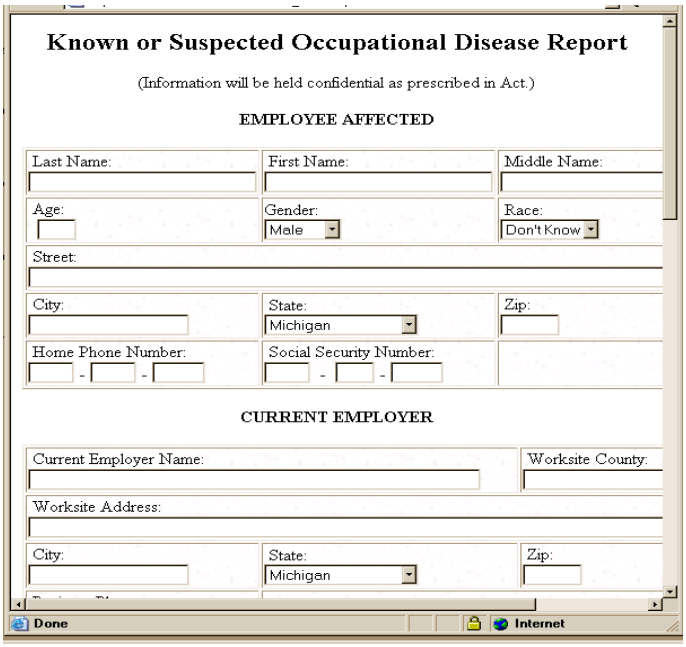
ELECTRONIC REPORTING

We continue to need your assistance in recognizing and reporting work-related noise-induced hearing loss. It is important to note that noise at work is only required to be a *contributor* to the hearing loss, and not the sole source of noise exposure in order for the hearing loss to be categorized as *work-related*. Additionally, the hearing loss can be known ***or suspected*** to be work-related in order to be eligible for reporting to the state.

We accept reports electronically, by regular mail, telephone and fax. Some audiologists and otolaryngologists find it is easier to report electronically. On our web site: www.oem.msu.edu you can click on "disease report form" to be given the option to submit a report electronically, along with the audiometric test results. This is a secure server for confidential medical data. A picture of the electronic reporting form is shown. To make electronic reporting simpler, you can be assigned an ID number so that you do not have to reenter your contact information for each patient.

If you need assistance reporting, please contact Amy Krizek at 1-800-446-7805.



Now Hear This...

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Michigan Law Requires the Reporting of Known or Suspected Occupational NIHL

Reporting can be done by:

Internet
www.oem.msu.edu
E-Mail
ODREPORT@ht.msu.edu
FAX
517-432-3606
Telephone
1-800-446-7805
Mail
MIOSHA-MTS Division
P.O. Box 30649
Lansing, MI 48909-8149

Suggested Criteria for Reporting Occupational NIHL

1. A history of significant exposure to noise at work; AND
2. A STS of 10 dB or more in either ear at an average of 2000, 3000 & 4000 Hz. And the employee's total hearing level is 25 dB or more at the same three frequencies. OR
3. A fixed loss.*

*Suggested definitions: a 25 dB or greater loss in either ear at an average of: 500, 1000 & 2000 Hz; or 1000, 2000 & 3000 Hz; or 3000, 4000 & 6000 Hz; or a 15 dB or greater loss in either ear at an average of 3000 & 4000 Hz.