

Now Hear This . . .



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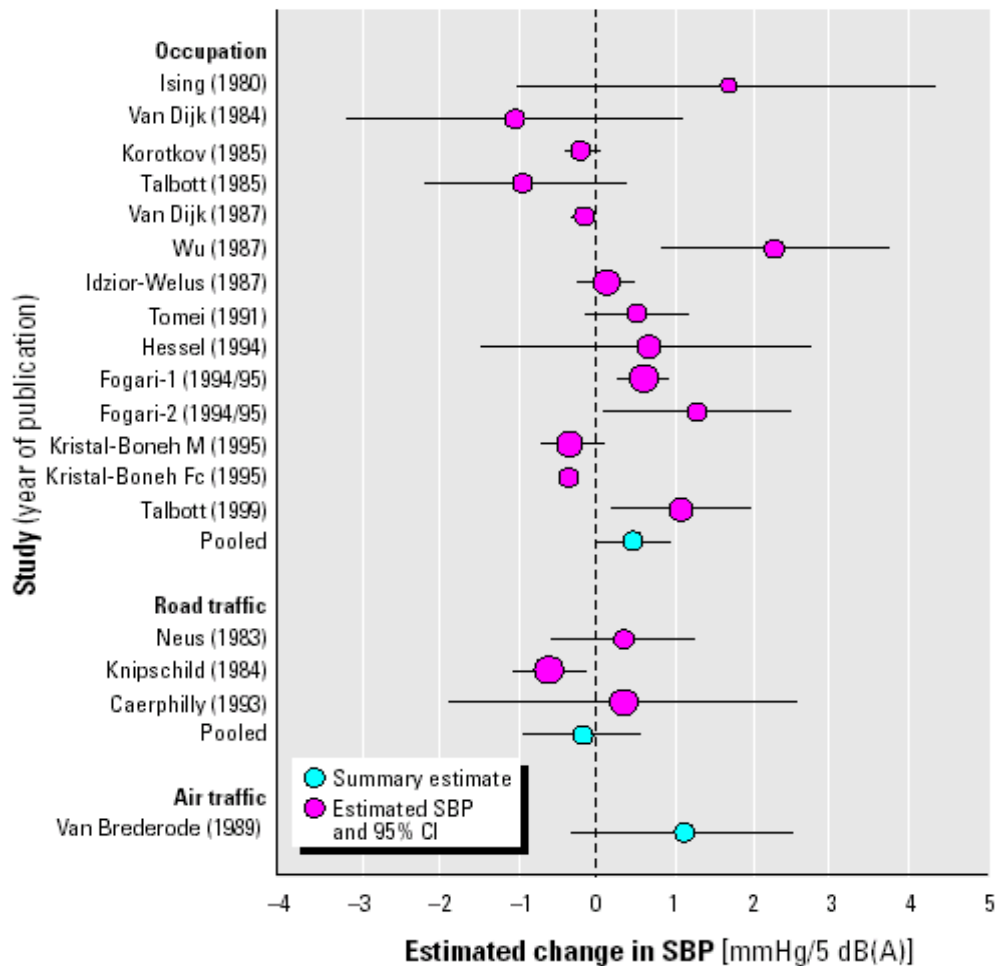
Noise and Blood Pressure

There have been numerous studies that have investigated the possible effect of either work or environmental noise exposure on blood pressure. Ninety percent of hypertension is defined as “essential” (cause unknown) and investigation of the cause of hypertension remains an active area of research.

A review paper published in 2002 of 43

published articles concluded that for each five decibel increase in occupational noise exposure there is an increase of .51 (95% CI .012 – 1.00) mm Hg in systolic blood pressure and a 14% increase (relative risk of 1.14 (95% CI 1.01 – 1.29) in the occurrence of hypertension (1). Figure 1 shows a summary of the study results for systolic blood pressure by source of noise; occupation, road traffic or air traffic. Figure 2

Figure 1. The association between noise exposure and systolic blood pressure change, adjusted for sex, age, and work type. Abbreviations: CI, confidence interval; SBP, systolic blood pressure change. The dotted line corresponds to no effect of occupational noise exposure on systolic blood pressure. The measurement ranges of the studies included were occupational noise exposure $L_{Aeq,8hr}$ 50-116 dB(A); road traffic noise exposure $L_{Aeq,6-22hr}$ 51-80 dB(A); and air traffic noise exposure $L_{Aeq,7-19hr}$ 63 to > 75 dB(A). This estimate has a large variance.



shows a summary of the study results for work-related noise exposure and hypertension.

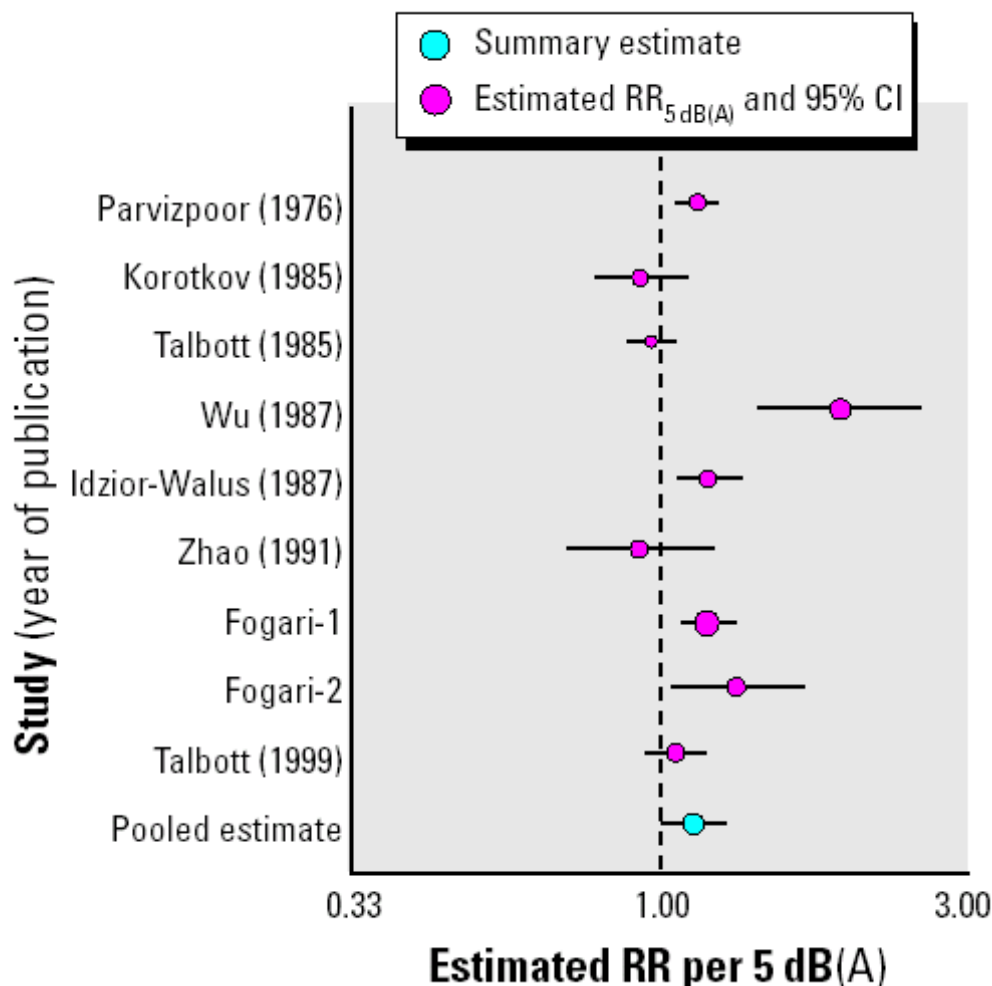
The most recent article included in the above review was published in 1999. Additional studies since then have also found an association between work-related noise and blood pressure (2-5). Although one of the studies has suggested the effect is only transient in people under the age of fifty.

Possible biological mechanisms for the association between noise and high blood pressure are: 1) release of stress hormones such as steroids; and 2) activation of the sympathetic nervous system with release of epinephrine. Animal models have shown both these changes.

Additionally, a recent article demonstrated genetic changes (damage) in rat heart cells. These changes persisted after noise exposure ceased (6). Finally chronic noise exposure has been associated with hyperlipidemia (7). Hyperlipidemia may, by causing atherosclerosis, increase the risk for hypertension.

The bottom line of all this data is that although individual authors have described the results of their studies as being limited, the number of articles with similar results is very suggestive that noise does have an adverse effect on blood pressure. Knowledge of all the possible effects of noise can but only help to motivate our patients to protect against noise exposure.

Figure 2. The association between occupational noise exposure and hypertension, adjusted for age, sex, and work type. CI, confidence interval. The dotted vertical line corresponds to no effect of occupational noise exposure. Measurement range of the studies, $L_{Aeq, 8hr}$, 55-116 dB(A).



References

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Electronic Reporting

A number of audiologists are now reporting electronically using the web site at: www.chm.msu.edu/oem to report. Clinics, health care provider offices or individuals that regularly report using the web site are assigned a personal identification number. The ID number adds another level of security and reduces the amount of data entry as the ID number replaces the contact information in the 'Report Submitted By' section of the form. The web site also allows audiometry reports to be submitted electronically.

If you have an interest in submitting reports electronically, email or call Amy Sims or Noreen Hughes at ODReport@ht.msu.edu, 1-800-446-7805.

The screenshot shows a Microsoft Internet Explorer browser window titled "OEM Form - Microsoft Internet Explorer". The address bar displays "https://ntweb11.ais.msu.edu/oem/HL_form1.asp". The main content area contains the following form:

Known or Suspected Occupational Disease Report
(Information will be held confidential as prescribed in Act.)

EMPLOYEE AFFECTED

Last Name:	First Name:	Middle Name:
<input type="text"/>	<input type="text"/>	<input type="text"/>
Age: <input type="text"/>	Gender: Male <input type="button" value="v"/>	Race: Don't Know <input type="button" value="v"/>
Street: <input type="text"/>		
City: <input type="text"/>	State: Michigan <input type="button" value="v"/>	Zip: <input type="text"/>
Home Phone Number: <input type="text"/> - <input type="text"/> - <input type="text"/>	Social Security Number: <input type="text"/> - <input type="text"/> - <input type="text"/>	

CURRENT EMPLOYER

Current Employer Name: <input type="text"/>	Worksite County: <input type="text"/>	
Worksite Address: <input type="text"/>		
City: <input type="text"/>	State: Michigan <input type="button" value="v"/>	Zip: <input type="text"/>

The browser window shows a status bar at the bottom with "Done" and "Internet" icons.

Now Hear This...

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Address service requested.

In this issue:
Noise and Blood Pressure

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Michigan Law Requires the Reporting of Known or Suspected Occupational NIHL

Reporting can be done by:

FAX 517-432-3606
Telephone 1-800-446-7805
E-Mail ODRREPORT@ht.msu.edu
Web www.chm.msu.edu/ocem

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. 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.

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