

Supplemental Online Content

Jiang Z, Wang J, Feng Y, et al. Analysis of early biomarkers associated with noise-induced hearing loss among shipyard workers. *JAMA Netw Open*. 2021;4(9):e2124100. doi:10.1001/jamanetworkopen.2021.24100

eFigure 1. Hearing Thresholds as a Function of CNE at Different Frequencies Among Workers Older Than 40 Years

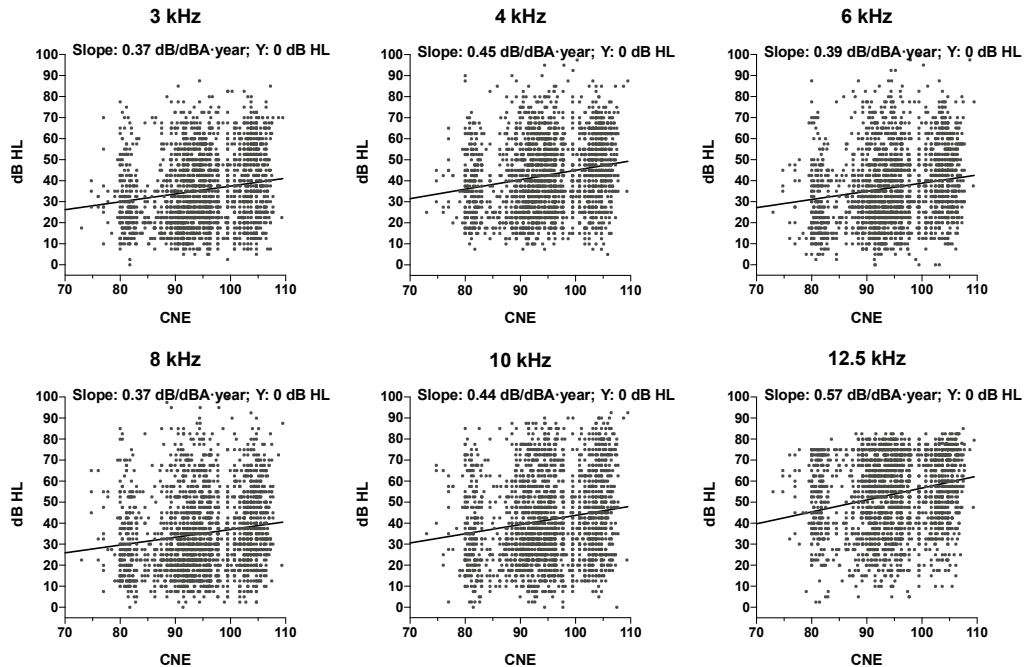
eFigure 2. High Frequency Hearing Thresholds as a Function of Career Length Among Workers Aged 40 Years or Younger

eFigure 3. High Frequency Hearing Thresholds as a Function of Career Length Among Workers Older Than 40 Years

eFigure 4. Hearing Thresholds as a Function of Career Length in the Sander Area

eFigure 5. Hearing Thresholds as a Function of Career Length in the Welder Area

This supplemental material has been provided by the authors to give readers additional information about their work.

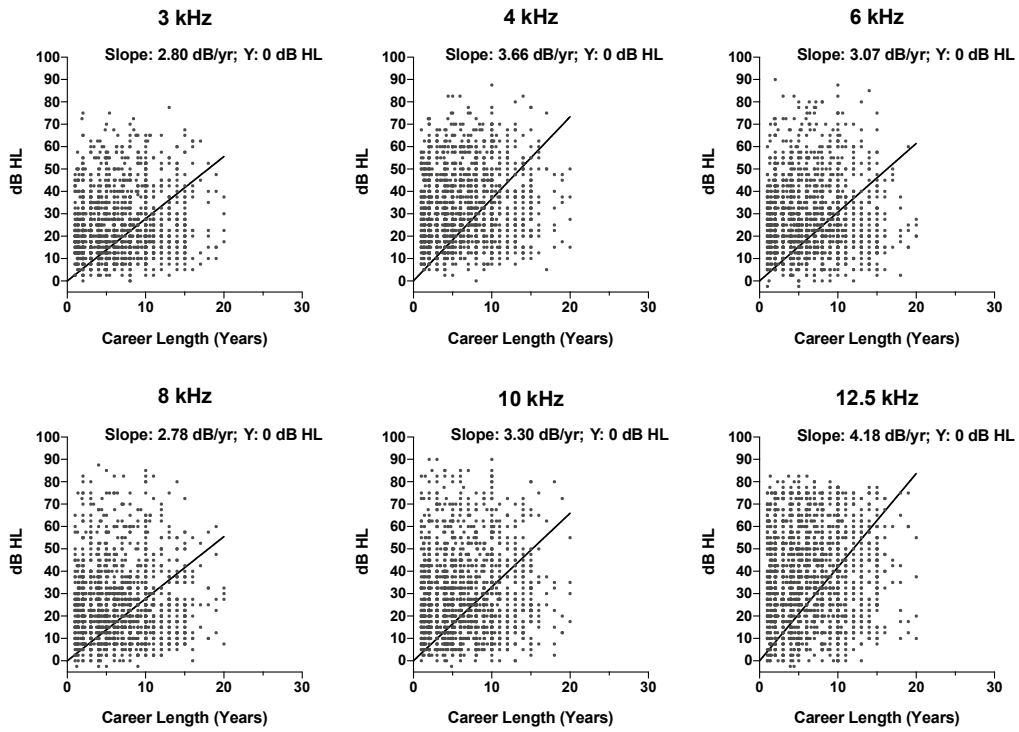


eFigure 1. Hearing Thresholds as a Function of CNE at Different Frequencies Among Workers Older Than 40 Years

The black solid line is a fitting line with an intercept of 0.

Effect of career length on NIHL

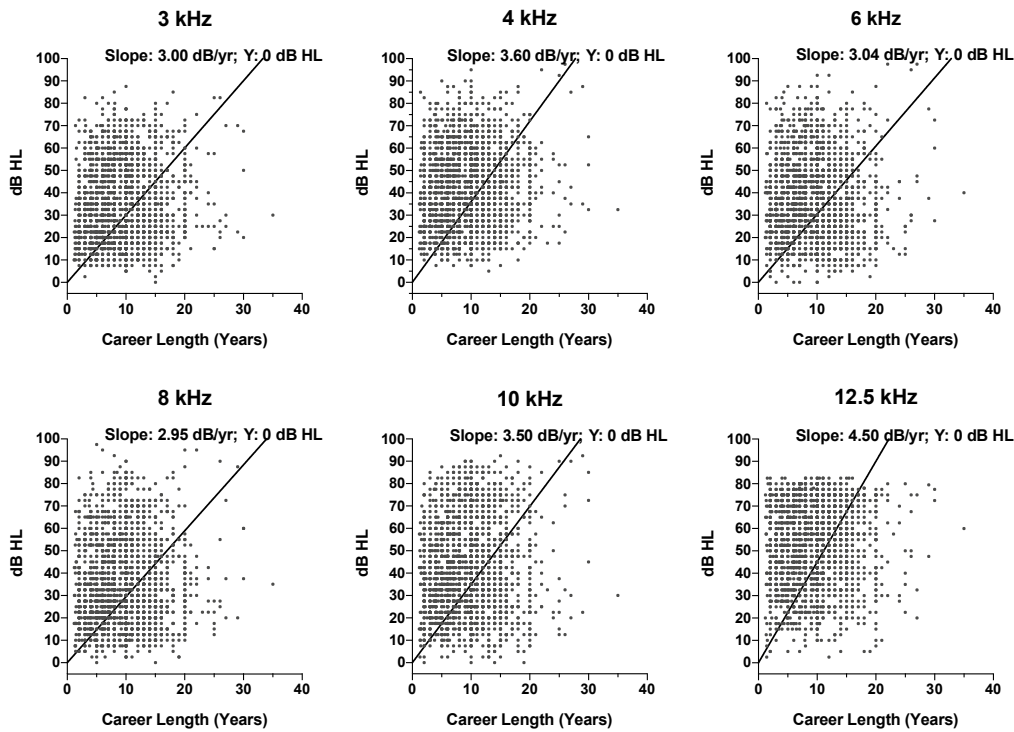
To determine how NIHL was affected by the career length, scatterplots were constructed at high frequency showing the hearing threshold as a function of career length for each subject. In the younger group (≤ 40 years, eFigure 2), hearing thresholds increased with career length most rapidly at 12.5 and 4 kHz, followed by 10, 6, 3 and 8 kHz; the slopes at these frequencies were 4.18 (95% CI, 4.01-4.35), 3.66 (95% CI, 3.53-3.80), 3.30 (95% CI, 3.15-3.44), 3.07 (95% CI, 2.94-3.20), 2.78 (95% CI, 2.67-2.89), and 2.78 (95% CI, 2.65-2.90) dB/year. In the older group (>40 years, eFigure 3), hearing thresholds also increased with career length most rapidly at 12.5 and 4 kHz, followed by 10, 6, 3 and 8 kHz; the slopes at these frequencies were 4.50 (95% CI, 4.38-4.62), 3.60 (95% CI, 3.50-3.70), 3.50 (95% CI, 3.39-3.60), 3.04 (95% CI, 2.95-3.14), 3.00 (95% CI, 2.91-3.09), and 2.95 (95% CI, 2.85-3.04) dB/year.



eFigure 2. High Frequency Hearing Thresholds as a Function of Career Length

Among Workers Aged 40 Years or Younger

The black solid line is a fitting line with an intercept of 0.



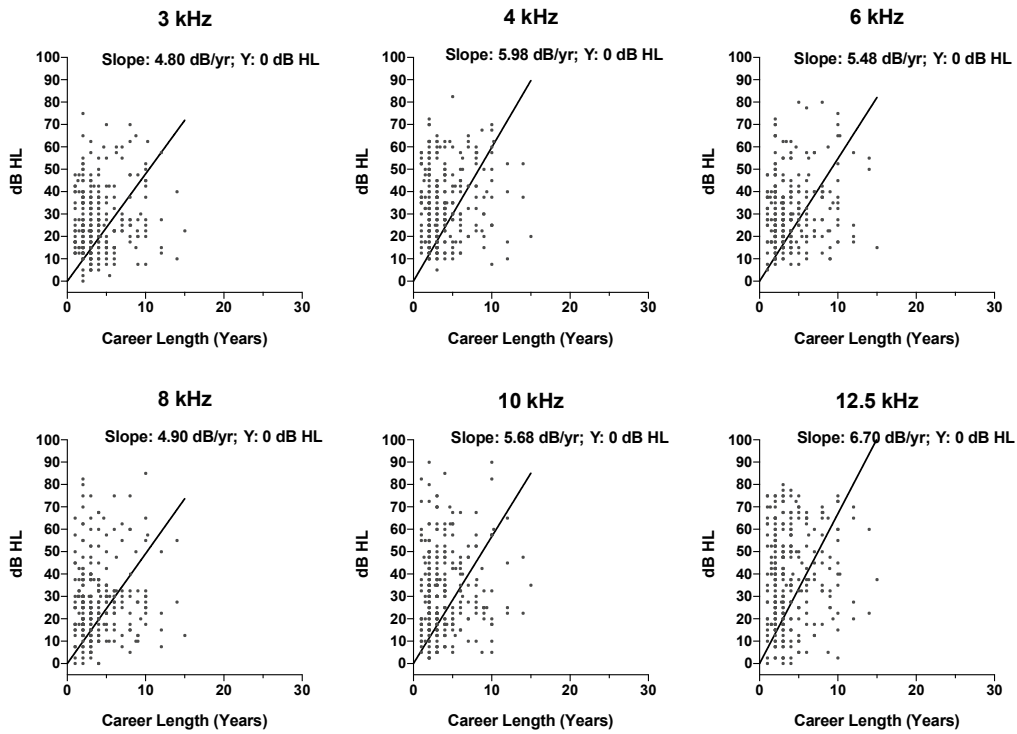
eFigure 3. High Frequency Hearing Thresholds as a Function of Career Length Among Workers Older Than 40 Years

The black solid line is a fitting line with an intercept of 0.

Effect of occupational Leq-8h level on NIHL

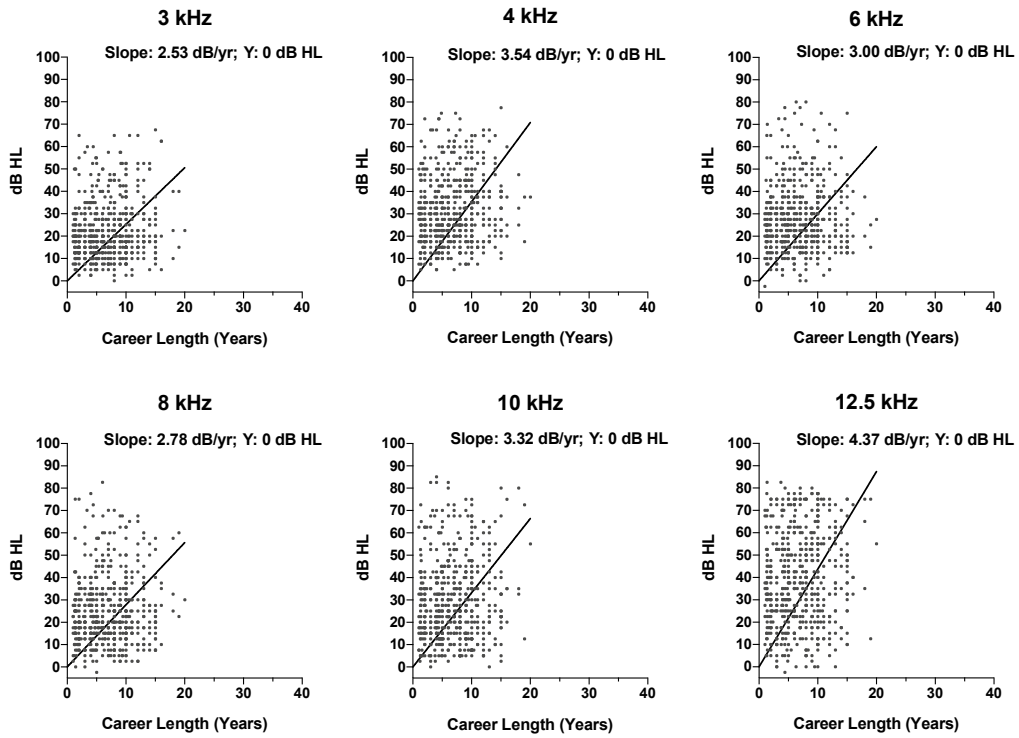
Because the magnitude of NIHL has long been known to be strongly dependent on exposure intensity, scatterplots were constructed to show the effect of occupational Leq-8h level on NIHL for the age-matched young workers in the higher noise Sander area (~95 dBA, n=288) and the lower noise Welder area (~82 dBA, n=547). There was no significant difference in age (mean [SD]) between the Sander (32.5 [4.6] years) and Welder workers (32.4 [4.8] years) ($p > 0.05$). Among the Sanders (eFigure 4), the slopes showing the growth rate of hearing loss with career length was 4.80 (95% CI, 4.33-5.27), 5.98 (95% CI, 5.42-6.54), 5.48 (95% CI, 4.97-5.99), 4.90 (95% CI, 4.39-5.44) 5.68 (95% CI, 5.09-6.26) and 6.70 (95% CI, 6.02-7.38) dB/year for 3, 4, 6, 8, 10 and 12.5 kHz, respectively. For the Welders (eFigure 5), the slopes were 2.53 (95% CI, 2.36-2.70), 3.54 (95% CI, 3.33-3.76), 3.00 (95% CI, 2.79-3.21), 2.78 (95% CI, 2.58-

2.98), 3.32 (95% CI, 3.08-3.55) and 4.37 (95% CI, 4.08-4.65) dB/year for 3, 4, 6, 8, 10 and 12.5 kHz, respectively. In general, the slopes were steeper for workers in the high-noise-level Sander area than the low-noise-level Welder area. Moreover, the slopes were steeper in both Sander and Welder areas at 12.5 kHz, and 4 kHz.



eFigure 4. Hearing Thresholds as a Function of Career Length in the Sander Area.

The black solid line is a fitting line with an intercept of 0.



eFigure 5. Hearing Thresholds as a Function of Career Length in the Welder Area

The black solid line is a fitting line with an intercept of 0.