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How accurate are bedside hearing tests?

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HOW ACCURATE ARE BEDSIDE HEARING TESTS?

To the Editor: We read with interest the article by Boatman et al., who conclude that bedside tests for hearing loss have low sensibility and good specificity.¹ We concur with the authors that despite their wide use among neurologists, these tests are not appropriate screening tools.²⁻⁴ We recently conducted a similar study to determine the accuracy of the Rinne and Weber tuning fork tests, using pure-tone audiometry as the standard reference, and to establish the diagnostic concordance between the combined use of them and tonal audiometry.

We studied 58 subjects (116 ears) administering the Rinne and Weber tests with 128 Hz and 256 Hz tuning forks. Later on the same day, an audiologist carried out a tonal audiometry blinded to the bedside test results. Positive Rinne test and Weber test lateralizing to the same ear indicated conductive hearing loss, whereas a negative Rinne test and a Weber response lateralizing to the contralateral ear indicated a sensorineural hearing loss. Hearing loss was defined when threshold was >20 db at any frequency in one or both ears.

The Weber test showed low sensibility (40% and 60%, 128 Hz and 256 Hz tuning forks) and modest specificity (68% and 69%). In contrast, the Rinne test had good specificity (90% and 93%) but only modest sensibility (88% and 52%). In both tests, the positive likelihood ratios were lower than 10 (Weber 8.8 and 8.3, Rinne 1.3 and 1.98) and the negative likelihood ratios were lower than 1 (Weber 0.85 and 0.57, Rinne 0.13 and 0.15). The diagnostic concordance between the findings in bedside tests and tonal audiometry was poor (Kappa concordance coefficient: 0.38 for the 128 Hz tuning fork and 0.37 for the 256 Hz tuning fork).

The use of 128 Hz or 256 Hz tuning forks did not significantly modify the Rinne and Weber utility. We conclude that the Rinne and Weber tests do not reliably predict the presence and type of hearing loss. However, a positive Rinne test could be used to discriminate between conductive

hearing loss and other conditions (specificity greater than 90%).

Our work confirms the Boatman et al. findings; the Rinne and Weber test results should not prevent neurologists from indicating an audiometry test to diagnose the existence of hearing loss.

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Disclosure: The authors report no conflicts of interest.

Reply from the Authors: We thank Dr. Kauffman et al. for sharing results from their study of tuning fork tests. Their findings support our conclusion that bedside tests are unreliable screening tools for detection of hearing loss.

As noted, the Weber test was developed to detect unilateral hearing loss. While it may be effective at doing so, hearing loss in older adults is typically bilateral. Although a nonlateralizing Weber does not rule out bilateral hearing loss, we have observed that many examiners pronounce hearing “normal” if the Weber does not lateralize. Likewise, the Rinne test, which differentiates conductive from sensorineural (SN) hearing loss, will be normal even if a significant SN hearing loss is present, as is often the case in older adults.

When there is suspicion of hearing loss, we agree with Kauffman and colleagues that audiometry should be performed even if bedside tests are normal.

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Disclosure: The authors report no conflicts of interest.

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