

Assessing tinnitus and disability

From a workers' compensation standpoint, assessing tinnitus poses challenges. The subjective nature of tinnitus makes measurement difficult, and the medical literature related to tinnitus and disability does not lend itself to meta-analysis. However, a systematic review of the literature allows us to address several relevant questions:

- How do we evaluate tinnitus causality?
- How do we fairly represent the evidence for impairment and disability due to tinnitus?
- What is the evidence that tinnitus, by itself, causes measurable disability?
- What is the evidence for treatment?

Measurement and assessment tools

Testing definitions include reproducibility (the test provides very similar results when administered to the same population twice), accuracy (the test measures what it is supposed to), and appropriateness (the test result addresses a question involved in this project). Accuracy is a minimum requirement.

With respect to accuracy, it is important to measure the amount of tinnitus present, not the effect of depression, anxiety, hearing loss, or other factors. For the most part, it is not possible to measure the amount of tinnitus, so accuracy is in significant doubt. This is a major problem in assessing disability due to tinnitus.

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All the methods of assessing tinnitus are based on subjective responses like questionnaires and self-reporting scales. Some measure the loudness or sound frequency of tinnitus by matching sounds presented by the tester or the ability of presented sounds to mask the tinnitus. Test reliability is poor even in the same subject. The Tinnitus Handicap Inventory is the most appropriate scale with the best validation.

Causality

The literature is consistent in concluding that acoustic trauma causes tinnitus, which may persist even if the hearing loss resolves. The threshold of acoustic trauma in most of the literature is about 115 dB for 15 minutes, or 140 dB of impact trauma.

Tinnitus can also result from causes other than noise-induced hearing loss. The evidence for causation of tinnitus is adequate for sensorineural hearing loss, high-dose ASA, and NSAIDs.

Occupations with greater intensity and duration of noise exposure are associated with greater incidence of tinnitus. There is no particular employment that causes tinnitus, apart from association with noise-induced hearing loss.

There is no evidence that the quality of tinnitus varies according to cause. Some

papers suggest that the frequency of tinnitus is predicted by the frequency of hearing loss, but this is not consistent.

Disability

In tinnitus discussions, handicap refers to impairment that substantially limits one or more of life's activities, which could be overcome by special compensation such as assistive listening devices or hearing aids.

There is no evidence to support the idea that tinnitus alone causes disability. Most patients with tinnitus do not request treatment; only about 10% report severe or disabling tinnitus. Some of the best data suggest that tinnitus loudness correlates well with disability.

Depression, anxiety, and other psychological factors frequently coexist with and strongly affect the reported magnitude of tinnitus. Some tools measure tinnitus and some measure impairment, after controlling for depression.

Because of the limitations of available assessment tools, it is not possible to define a threshold measure at which tinnitus causes impairment. For the same reason, there is no evidence that impairment from tinnitus alone varies according to its cause. This does not mean that tinnitus does not cause impairment, only that the tools are inadequate.

Treatment

Cochrane reviews consistently report no effective treatment for tinnitus.¹ Many reviews consider all patients together without differentiating based on severity. Several papers have specifically addressed the use of antidepressants in severely affected patients and reported efficacy.

A Cochrane review in 2006 did not find support for the treatment of tinnitus with antidepressants, but this review considered all tinnitus patients together, not differentiating severely affected ones. Other Cochrane reviews included betahistine,

gingko, carbamazepine/gabapentin, zinc, cognitive-behavioral therapy, and tinnitus retraining therapy/masking therapy. These reviews showed no treatment effect. Cognitive-behavioral therapy appeared to improve quality of life and depression, but not tinnitus loudness.

Of other nonpharmacologic measures, only measures that improve hearing, such as the use of hearing aids, have credible evidence of efficacy across many patients. Beyond depression, fatigue, and other psychological factors, no other factor strongly influences the outcome for tinnitus. ■

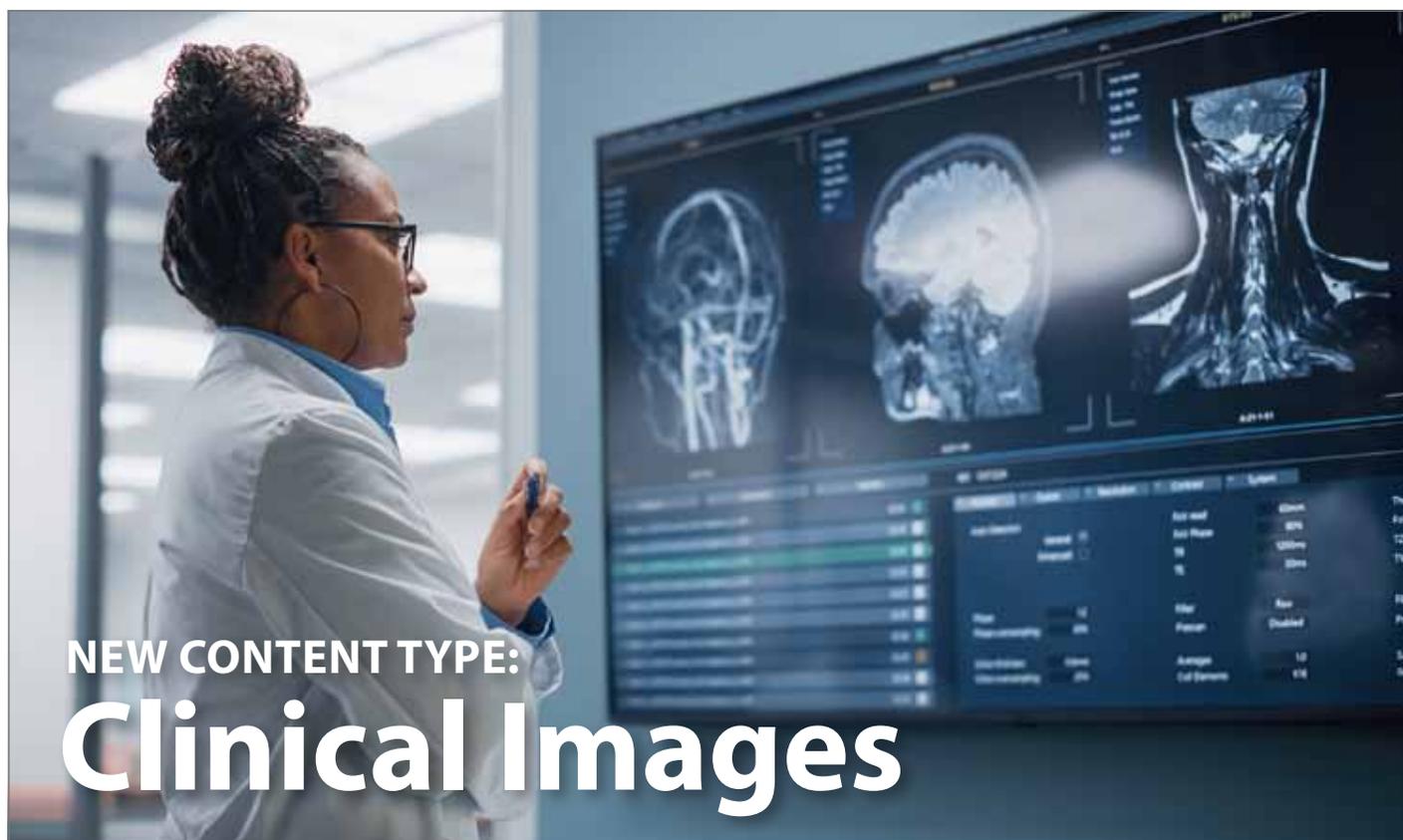
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1. Washington State Health Care Authority. Tinnitus: Non-invasive, non-pharmacologic treatments: Final evidence report. 10 April 2020. Accessed 20 January 2023. www.hca.wa.gov/assets/program/tinnitus-final-rpt-20200410.pdf.

Additional reading

Piccirillo JF, Rodebaugh TL, Lenze EJ. Tinnitus. *JAMA* 2020;323:1497-1498.



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