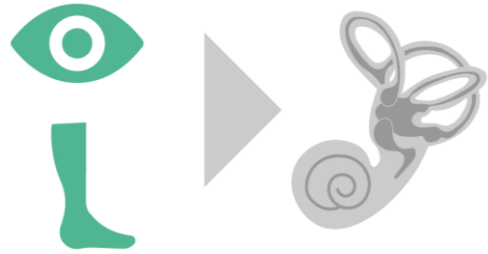
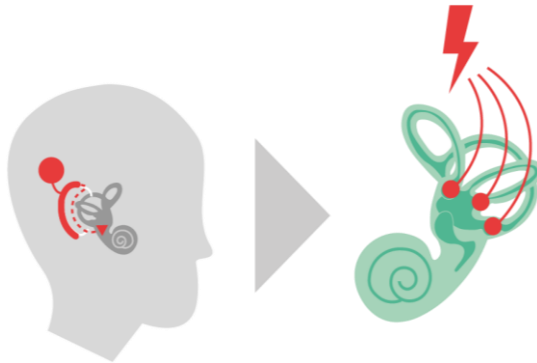


# Chronic vestibular disorders

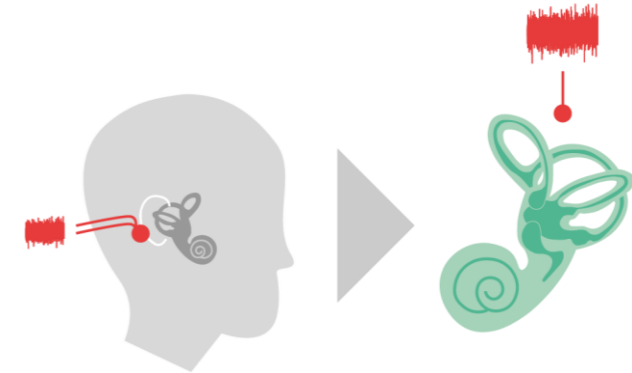
## Treatment options



▶ vestibular rehabilitation



▶ vestibular implant



▶ vestibular noise stimulation

CLINICAL PRACTICE GUIDELINES

### Vestibular Rehabilitation for Peripheral Vestibular Hypofunction: An Updated Clinical Practice Guideline From the Academy of Neurologic Physical Therapy of the American Physical Therapy Association

Hall, Courtney D. PT, PhD; Herdman, Susan J. PT, PhD, FAPTA; Whitney, Susan L. DPT, PhD, NCS, ATC, FAPTA; Anson, Eric R. PT, PhD; Carender, Wendy J. PT, MPT, NCS; Hoppes, Carrie W. PT, PhD, NCS, OCS, ATC; Cass, Stephen P. MD, MPH; Christy, Jennifer B. PT, PhD; Cohen, Helen S. OTR, EdD, FAOTA; Fife, Terry D. MD, FAAN, FANS; Furman, Joseph M. MD, PhD; Shepard, Neil T. PhD; Clendaniel, Richard A. PT, PhD; Dishman, J. Donald DC, MSc, FIACN, FIBE; Goebel, Joel A. MD, FACS, FRCS; Meldrum, Dara MSc, PhD; Ryan, Cynthia MBA; Wallace, Richard L. MSLS, EdD, AHIP; Woodward, Nakia J. MSIS

ORIGINAL ARTICLE

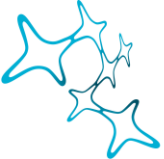
### Posture, Gait, Quality of Life, and Hearing with a Vestibular Implant

M.R. Chow, A.I. Ayiotis, D.P. Schoo, Y. Gimmon, K.E. Lane, B.J. Morris, M.A. Rahman, N.S. Valentin, P.J. Boutros, S.P. Bowditch, B.K. Ward, D.Q. Sun, C. Treviño Guajardo, M.C. Schubert, J.P. Carey, and C.C. Della Santina

frontiers | Frontiers in Neuroscience

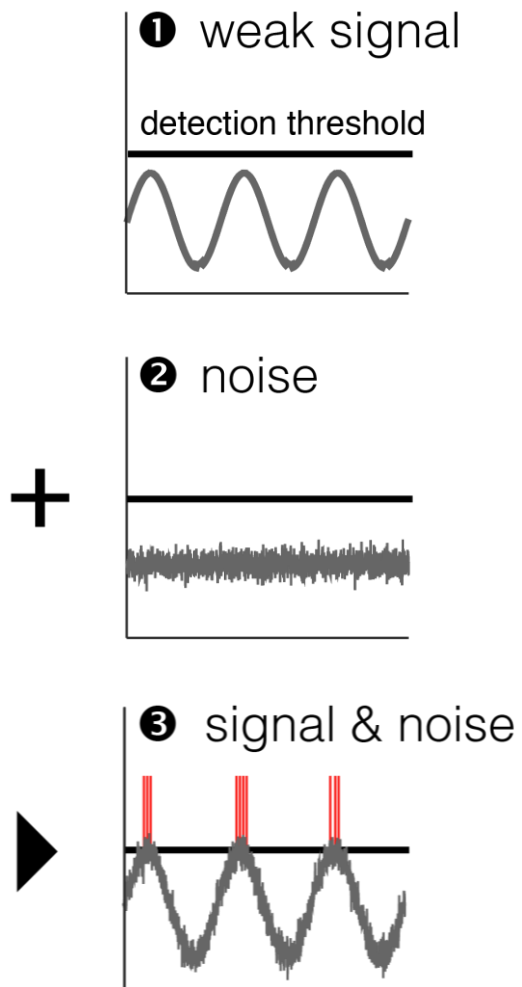
### Efficacy of nGVS to improve postural stability in people with bilateral vestibulopathy: A systematic review and meta-analysis

Ruth McLaren<sup>1\*</sup>, Paul F. Smith<sup>2,3</sup>, Rachael L. Taylor<sup>3,4</sup>, Shobika Ravindran<sup>1</sup>, Usman Rashid<sup>1</sup> and Denise Taylor<sup>1,3</sup>

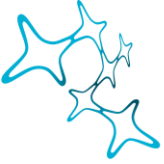


# Stochastic resonance

## Mechanism



Simonotto et al., Phys Rev Lett 1997, Collins et al., Nature 1995, McDonnell & Ward, Nat Rev Neurosci 2011



# Noisy galvanic vestibular stimulation

## Functionality assessment

