

For those who like sABR welcome to ...

# SimHERA

Windows 8/10  
Mac OS (10.12-10.15)

EcochG  
ABR  
CAEP  
with more to come



## Simulated Human Evoked Response Audiometry

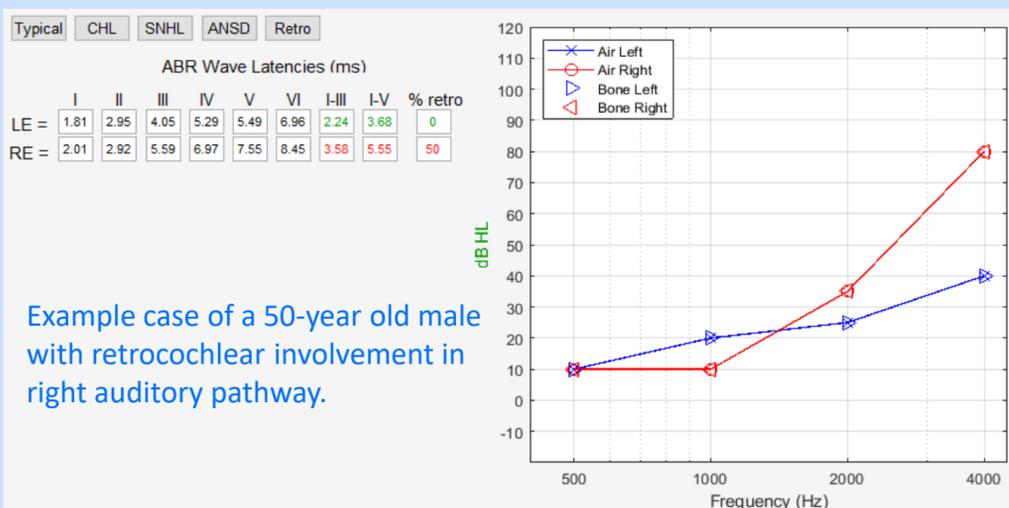
### Innovative Virtual Training of Human Evoked Response Audiometry (HERA)

- SimHERA provides real-time simulations as if learners are performing live HERA testing on patients and clients
- SimHERA is a virtual suite of software tools loaded with features that are specifically designed for teaching clinical HERA testing of infants and adults with various levels and types hearing functions
- As a multipurpose educational software tool, SimHERA can be used for self-directed clinical training and practice, one-on-one teacher-to-student instruction, and full-course integration with random and predefined cases and instructor-protected assignments and exams for in-class or remote learning
- developed over 10 years by Dr. Tony Herdman for teaching HERA at The University of British Columbia



#### SimHERA's case simulator

- Simulate any hearing case of **typical, conductive, sensorineural, retrocochlear, or auditory neuropathy spectrum disorder** across all ages (birth to 120)

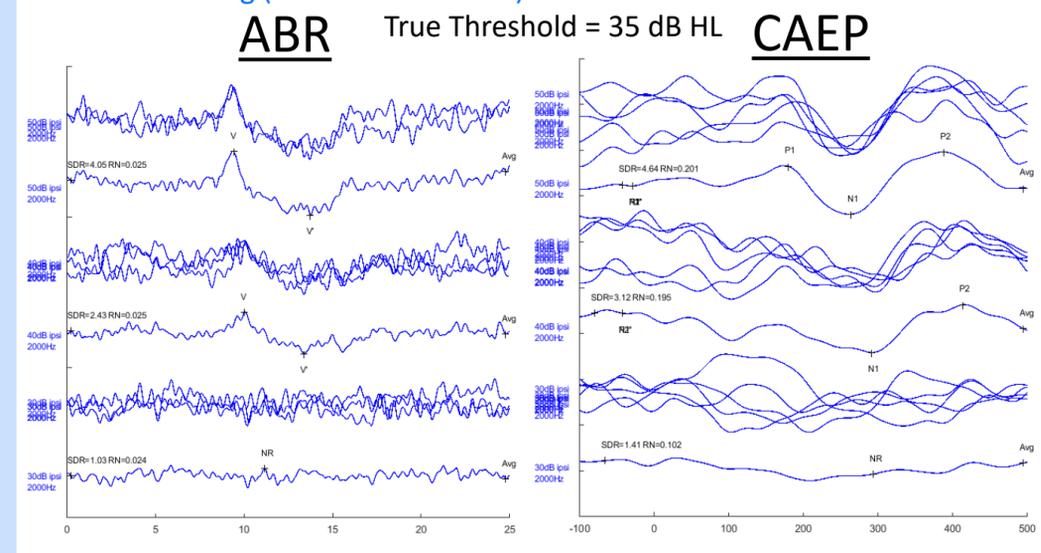


- Build your own cases or allow SimHERA to randomly generate cases based on epidemiological prevalence
- Instructors can hide and lock specific case information in order to effectively and fairly evaluate student performances during remote or in-class SimHERA assignments and exams

#### SimHERA's simulators (EcochG, ABR, CAEP, and more to come)

- Easily perform multiple HERA tests, such as Electrocochleography (EcochG), Auditory Brainstem Response (ABR) and Cortical Auditory Evoked Potentials (CAEP) on a single case
- Perform HERA using air- and bone-conducted stimuli

#### Threshold Testing (6-month old infant)

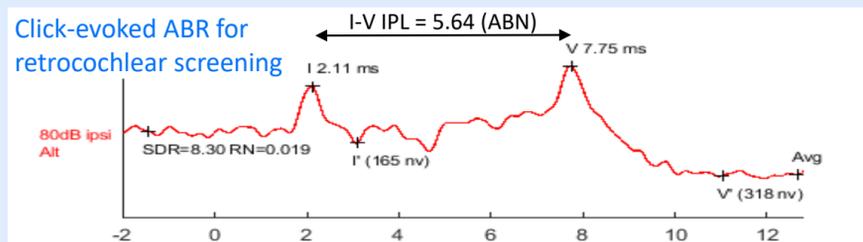


#### SimHERA's user-friendly interface

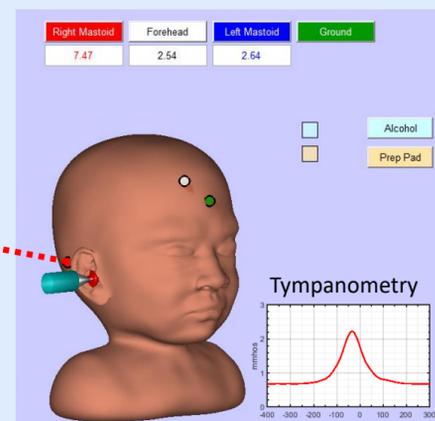
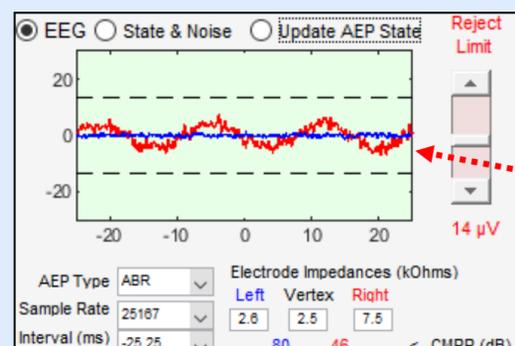
- Realistic online simulations for HERA testing just as if the learner was assessing real cases in the clinic



- Display the AEP wave and overlay the **signal-only** and **noise-only** waves to visualize true responses and noise
- Effortlessly change stimulus and recording parameters
- Easily mark waveforms and show peak amplitudes, peak latencies and waveform SDR, SNR, Fsp, and RN



- Set or randomly fluctuate EEG noise based on sleep/awake state across a user-set session time
- Standard and advanced waveform analyses: average, subtract, multiply, split buffer, FFT, wavelet
- Prep scalp and place electrodes on 3D models creating impedances that affect EEG noise and common-mode rejection ratio (CMRR)



# SimHERA's suite of feature-packed simulators

EcochG  
ABR  
CAEP  
with more to come

**Simulated Auditory Brainstem Responses (sABR)** is SimHERA's inaugural simulator that was developed over the past 10 years by Dr. Tony Herdman for teaching UBC's advanced electrophysiological course. sABR is based on over 75 years of ABR literature along with Dr. Herdman's 15 years of teaching electrophysiology to graduate students and over 20 years of research in the auditory neuroscience and neuroimaging. sABR has been part of training over 200 clinicians and students across multiple universities.

**Simulated Electrocochleography (EcochG)** is the most recent addition to the SimHERA suite. The EcochG module simulates cochlear potential (CM, SP, and CAP) from extratympanic electrodes. Like sABR, the EcochG simulator can simulate cochlear potentials for infants and adults with various hearing levels and types. Future updates will include modeling of cases with Ménière's Disease and EcochG for intra-operative monitoring.

**Simulated Cortical Auditory Evoked Potentials (CAEP)** is another recent addition to the SimHERA suite. The CAEP module simulates slow cortical potentials (P1-N1-P2) for evaluating hearing thresholds in infants and adults with various hearing levels and hearing types. Future updates will include CAEP testing of gap-detection thresholds for cases with central auditory processing disorders.

**Future SimHERA modules and updates** will include simulated Middle-Latency Responses (MLR), Auditory Steady-State Responses (ASSR), Late Auditory Evoked Potentials (LAEP; e.g., MMN, N2b, and P3), and otoacoustic emissions (OAEs). Dr. Herdman updates SimHERA regularly based on new findings, user feedback, and user requests.

**Student and Instructor versions of SimHERA** were specifically designed to meet the versatile needs of both in-class and remote-learning delivery. Student versions can be run in "open mode" where students can create their own cases or allow SimHERA to randomly create one. In "assignment mode", students can conduct HERA testing on their own computers with certain features locked, such as unable to see the audiogram or retrocochlear latency delays. This maintains the integrity of assignments and exams because students can't discover the "true" case characteristic until the cases are unlocked by an instructor version that is password protected. Students perform the assignments, generate online marked-up waveform reports, and send the digital report file to the instructor. The instructor version will unlock all features and reveal the audiogram and other case features in order to easily grade the assignments and exams.

**SimHERA's Open-Learning Community** is rapidly growing. Instructors, clinical trainers, and students who wish to share their own created SimHERA cases can easily do this with other community members privately or through SimHERA case database. **Web tutorials are also freely available to view online on the SimHERA website.**

**SimHERA can be installed on Windows 8/10 and Mac OS (10.12-10.15) computers** with typical laptop processing and memory capacities. SimHERA uses internet-based licensing so it can quickly be installed and running within an hour. There are no special dongles or hard-lock keys that need to be mailed or that can be lost or stolen. Also, SimHERA's internet-based licensing allows for easy transfer of a license to another computer in case of computer failure or the need to transfer back and forth from a student's to a university's computer. **This has been very useful for many universities during the COVID-19 pandemic.**

**SimHERA can be purchased** as a single-user license for 6- or 12-month durations. Class sets of student and instructor licenses can be purchased with additional educational offers. All updates to SimHERA are free for the duration of the license. Visit the SimHERA website for more information and purchasing or contact Dr. Herdman directly. **You can try it for free for 30 days!**

Purchase directly from Flintbox: <https://ubc.flintbox.com/#technologies/12131650-45d1-47b4-bd5b-8b66bbd956f5>

**An online ABR course using sABR** was also developed by Dr. Herdman and UBC's Centre for Professional Development to train audiologists, health practitioners, and students who might not have direct access to expert educators in HERA testing.

## Special Educational Offers and Web-Demos Available

For special educational offers for a class set of SimHERA licenses and/or the online ABR course please contact Dr. Tony Herdman at [aherdman@audiospeech.ubc.ca](mailto:aherdman@audiospeech.ubc.ca)

[audiospeech.ubc.ca/research/brane/simhera](https://audiospeech.ubc.ca/research/brane/simhera)

# Supporting Education in Audiology for over 10 years