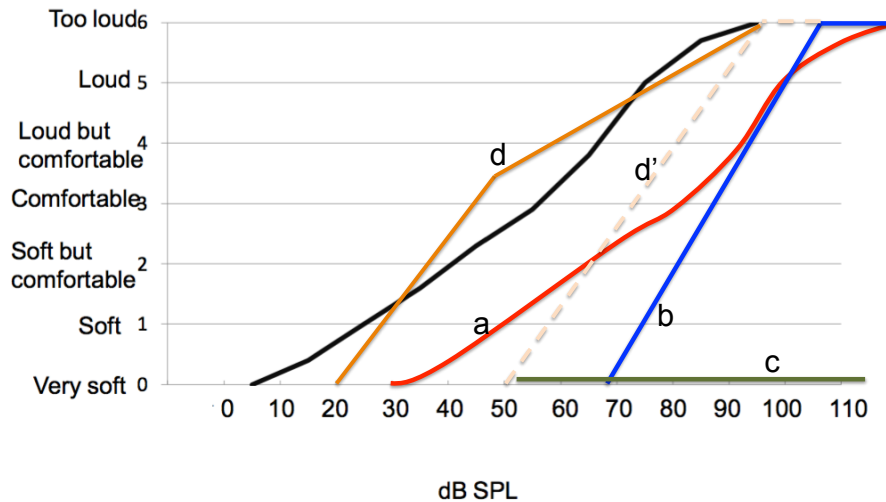


The Auditory System and Human Sound-Localization Behavior

Answers Exercises Chapter 14: Impaired Hearing.

Exercise 14.1:



Loudness growth curves for (a) 30 dB conductive loss, (b) OHC function loss, (c) IHC function loss, (d) sensorineural loss with HA

- (a) With a 30 dB conductive hearing loss the normal loudness growth curve will simply shift rightward by 30 dB.
- (b) With a sensorineural hearing loss of OHC function there is a dramatic shift of the recruitment threshold, in combination with a strongly reduced dynamic range.
- (c) When the IHC function is lost there is total deafness.
- (d) For OHC function loss nonlinear amplification can be useful to increase the dynamic range of acoustic input. For conductive hearing loss, however, nonlinear amplification leads to unnecessary distortions, and so this should not be considered. For IHC loss the only hope is a cochlear implant.
- (e) The hearing aid will shift the hearing loss of 50 dB leftward to 20 dB at the low levels, but at 45 dB HL the nonlinear compression kicks in, leading to a better dynamic range ('kneepoint').