

Desired Sensation Level: Building on a Foundation of Success

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Introduction

The DSL hearing aid fitting rationale is the most popular choice for paediatric hearing aid fittings. DSL 5.0 incorporates clinical and research-based findings into a modern and efficient prescriptive hearing aid fitting rationale. The official name of the 2005 version is “DSL m[i/o] v5.0,” referred to as “DSL 5.0.” The philosophy of DSL 5.0 is to assure maximum audibility while maintaining comfortable loudness across all acoustic environments (Seewald,

channel-matched to specific hearing aids. Additionally, gain corrections for conductive hearing losses and binaural fittings are addressed, as are severe and profound hearing losses.

DSL 5.0 recommends compression kneepoints that increase with the hearing loss (providing more gain) while keeping compression ratios less than 4:1 and while keeping thresholds as low as possible to avoid acoustic distortions.

Real Ear to Coupler Differences

The RECD is simply the difference between the measurement achieved using an insert earphone at the eardrum and the standard 2 cc coupler. As children have smaller ear canals than adults, and because the 2 cc coupler was designed to approximate adult ear canals, paediatric RECD values are larger (i.e., the differences are greater) than those of adults. Although real ear measures from each ear canal are preferred, DSL offers predicted age appropriate RECD values which can be used to help determine the DSL 5.0 prescription when needed.

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Summary

The Desired Sensation Level 5.0 hearing aid fitting rationale (Scollie, Seewald, Cornelisse, et al, 2005) is available in advanced technology hearing aids and hearing aid fitting programs. DSL 5.0 is available in our proprietary hearing aid fitting software (Genie 8) and DSL 5.0 is available in Oticon’s Sumo-DM and Safran hearing aids.

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Moodie, Scollie and Bagatto, 2005). DSL 5.0 supports modern hearing aid fittings by accommodating multiple memories, multi-channel compression and expansion across dynamic listening environments. While working within DSL all data (assessment, target, verification etc) is acquired in dB SPL to maximise consistency and minimise confusion.

DSL 5.0 offers specific and unique targets for adult and paediatric hearing aid fittings. Furthermore, multi-stage input/output levels are specified to accommodate variable input signal levels to the hearing aid. Expansion, linear, linear compression and output limiting approaches can be

Table 1. Summary of target changes in DSL v5.0.
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Change Description	Change amount and direction
Adult/acquired versus pediatric/congenital target	7 dB reduction for moderate losses, 3 dB for severe losses.
Interpolation	Greater number of target values across frequencies when working with partial audiograms.
Compression threshold	Less gain and output for low-level inputs due to prescribed compression threshold. Inputs of 70 dB and above are not affected.
Output limiting	Narrowband output limiting targets largely unaffected. Output limiting for speech may cause target reductions of 5 to 10 dB if hearing loss is severe or test level is high.
Quiet versus noisy environments	Compression threshold raised by 10 dB and gain reduced at low-importance speech frequencies by about 5 dB.
Binaural fittings	Optional. Will reduce targets for speech by 3dB. Output limiting targets are not affected.
Conductive or mixed hearing loss	Increases gain by up to 9 dB for mild losses, 5 dB for severe losses, depending on magnitude of air-bone gap.

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Recommended Readings & References

Bagatto, M, Moodie, S, Scollie, S, Seewald, R, Moodie, K, Pumford, J, & Liu, R.. (2005). Clinical protocols for hearing instrument fitting in the Desired Sensation Level Method, Trends in Amplification, 9(4): 199-226.
Desired Sensation Level Method: <http://www.dslio.com/>
Scollie, S. (2007): DSL Version v5.0: Description and Early Results in Children. See featured article in www.AudiologyOnline.com
1-15-2007. Scollie, S, Seewald, R, Cornelisse, L, Moodie, S, Bagatto, M, Larnagaray, D, Beaulac, S, & Pumford, J.

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The Desired Sensation Level multistage input/output algorithm. http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&list_uids=16424945&dopt=Abstract ■