

Abstracts – MEMRO 2006, Zurich July 27–30, 2006

4th International Symposium on Middle Ear Mechanics in Research and Otology

7.1

Keynote Lecture

The development and utility of quantitative models of middle-ear function

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Purpose: Middle-ear models are used to elucidate our understanding of the relationships between middle-ear structure and function as well as to make predictions of the effects of alterations in structure on function. A review of models in the literature reveals a range of model complexities, from simple heuristic models with a few parameters, to complex finite-element models with large numbers of parameters.

Materials & Methods: The talk will address the utility and the limitations of the different classes of middle-ear models via the discussion of illustrative examples of different model types ranging from simple lumped models through distributed element and finite-element models.

Results & Discussion: Models of hearing function in normal and pathological ears will be discussed: including heuristic models of middle-ear transformer function, lumped and distributed models of TM perforation and distributed and finite-element models of normal TM function. The discussion will include: What kinds of new data are needed to better test models of middle-ear function? and should model predictions, by themselves, be used to make clinical decisions, or should they only be used to direct further research? [Supported by NIDCD]