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Neonatal Screening models outside the US: Protocols and technology updates

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Special guest star : Barbara Cone-Wesson

Update on NHS technologies (20 min)

- OAE to AOAE (TEOAEs, DPOAEs)
- AABR
- Cochlea-Scan
- Tracking Software solutions
- ASSR (Barbara-10 min)

Update on NHS technologies

- OAE to AOAE
  - In order to increase the acceptance of OAE testing in non-specialized environments (maternity ward) manufacturers have started supporting the automated OAE (AOAE) format.
  - Despite the lack of widely-used criteria (specially for the DPOAEs) the AOAE testing is well received.
  - The testing protocols are evaluating TEOAE or DPOAE responses at 2.0 , 3.0 and 4.0 kHz.
  - The type of protocol use(TE vs DP) is gradually equalizing to a 50% - 50 %

Update on NHS technologies

- OAE to AOAE
  - Most commercial “automated” devices (Biologic, GSI, Interacoustics, Labat, Madsen/Zoth) support both TEOAE and DPOAE tests.
  - Despite the development of intelligent algorithms the automated devices tend to miss BORDER-LINE cases.
  - To note: a number of devices offer descriptions of the AOAE recording but not the actual data waveforms.

Update on NHS technologies

- AABR
  - The automated ABR protocol was conceived as a means to identify AN cases in the NICU population and to provide of a fast third-phase ABR information around a relative threshold of 35 dB nHL.
  - Commercially speaking, 4 devices are monopolizing the AABR testing arena. Biologic-ABaer, GSI-AudioScreener, Zoth-AccuScreen and a portable unit by Natus (Algo).
  - Note :The data from Algo are rather “cryptic” (parameters describing the evaluation of the recording) and numerical analyses are not possible.

Update on NHS technologies

- AABR-II
  - Many un-resolved technical issues are present such as: noise effects (ie muscular artifacts from an agitated infant), electrode impedance, stimulus intensity etc. These factors have a significant effect on the time and the quality of the AABR testing.
  - Faster and more precise algorithms are needed.

Update on NHS technologies

- Cochlea-Scan
  - The succesfull use of DPOAEs in screening has led to a development of a model by which sensorineural damage can be approximated in terms of hearing threshold (Janssen 2003, Gorga 2003).
  - Information from Input-Output DPOAE curves can be extrapolated to provide hearing estimates in dB HL.
  - In this context one may obtain not only PASS-REFER estimates, but for the REFER cases an estimate and a categorization (conductive vs sensorial) of the hearing threshold.

Update on NHS technologies (8 min)

- Cochlea-Scan-II
  - This approach is new and therefore requires time to be developed further and to mature clinically.
  - Several issues need to be addressed first, using large-size sample sets of WB and NICU infants.
  - Our experience indicates that the Cochlea-Scan approach introduces significant time DELAYS in a UNHS program.

Update on NHS technologies (CCScan)

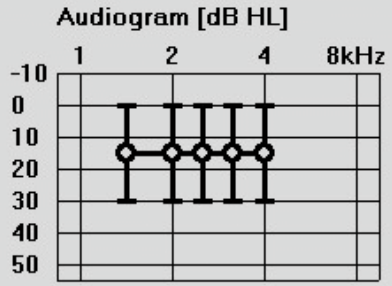
left Ear: CochleaScan - OK

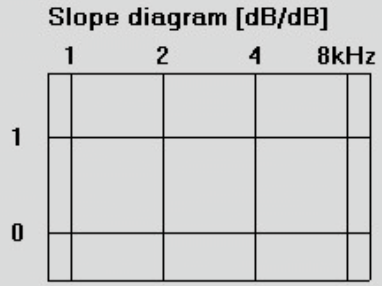
B7191, 2 min * 17/09/2004

Date of Test: 21/09/2004

Time of Test: 12.35.23

f2 [kHz]	TH [dB]	NF [dB]	L2 [dB]
1,5	<30	-08	30
2,0	<30	00	30
2,5	<30	-03	30
3,0	<30	-08	30
4,0	<30	-17	30
5,0	—	—	—





fischer-zoth

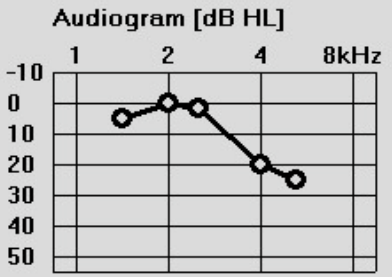
left Ear: CochleaScan - OK

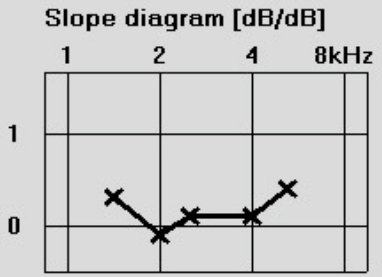
B7083, 15 min 29/08/04

Date of Test: 22/06/2004

Time of Test: 11.43.38

f2 [kHz]	TH [dB]	NF [dB]	L2 [dB]
1,5	05	-11	25
2,0	00	-12	20
2,5	02	-17	30
3,0	NA	-22	65
4,0	20	-17	40
5,0	25	-19	45





fischer-zoth

Update on NHS technologies (CCScan)

15 min ... Infant sucking... Calibration was impossible

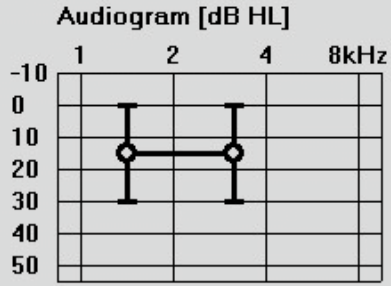
left Ear: CochleaScan - Error

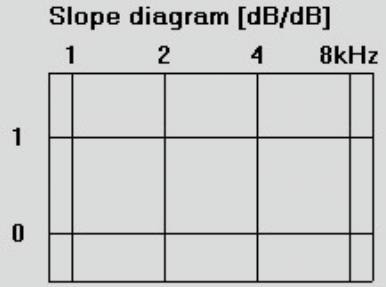
B7150, non fa calibr. bloc esame * 08/09/2004

Date of Test: 16/09/2004

Time of Test: 12.53.34

f2 [kHz]	TH [dB]	NF [dB]	L2 [dB]
1,5	<30	-05	30
2,0	—	—	—
2,5	—	—	—
3,0	<30	-07	30
4,0	—	—	—
5,0	—	—	—





fischer-zoth

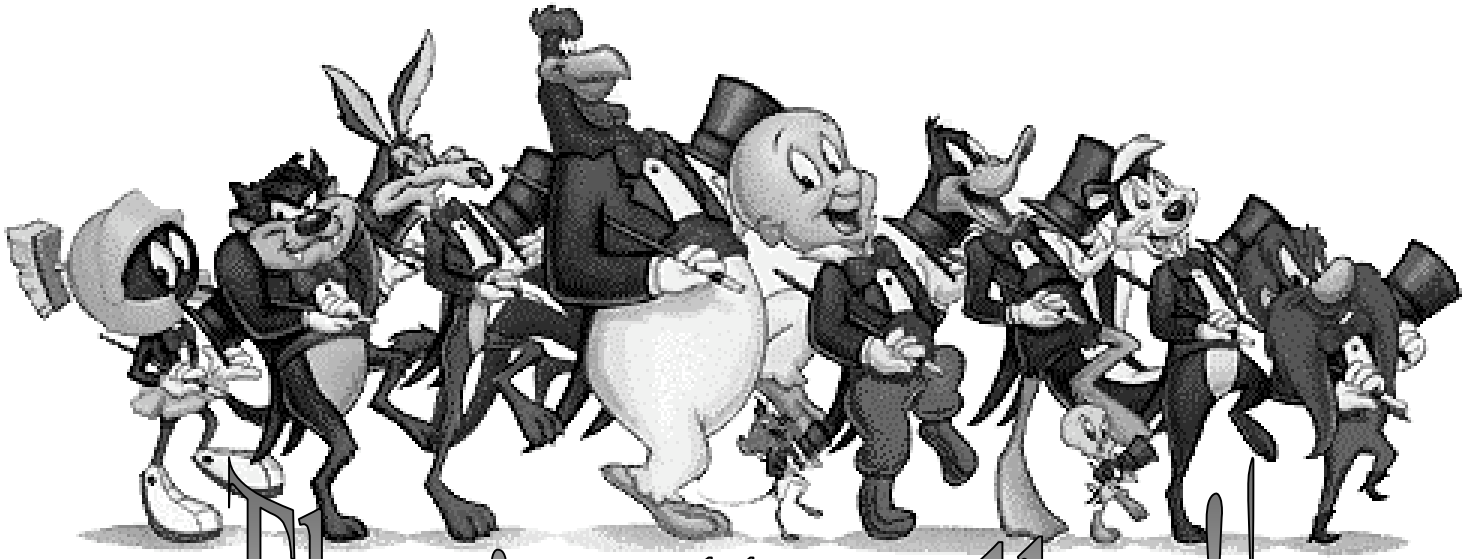
Update on NHS technologies

- Tracking Software:
  - With the diffussion of INTERNET and other web-technogies on a global scale, it might be possible to design software applications which can run from a centralized location and track UNHS or EHDI activities at remote locations.
  - Good tracking software is absolutely necessary to eliminate the leakage of retest cases. This issue is not addressed at all in the majority of NHS / EHDI programs.

Update on NHS technologies

- ASSR (comments before Barbara)
  - Recent developments in ASSR technology (mainly GSI, Audera) have suggested that it might be possible to estimate hearing threshold at 0.5, 1.0, 2.0 , 4.0 kHz efficiently. In this context it might be that a ASSR protocol can substitute the AABR...
  - An ASSR threshold estimation is needed in the evaluation of Cochlea-Scan.

Neonatal Screening models outside the US: PART 3



That's all Folks !!