



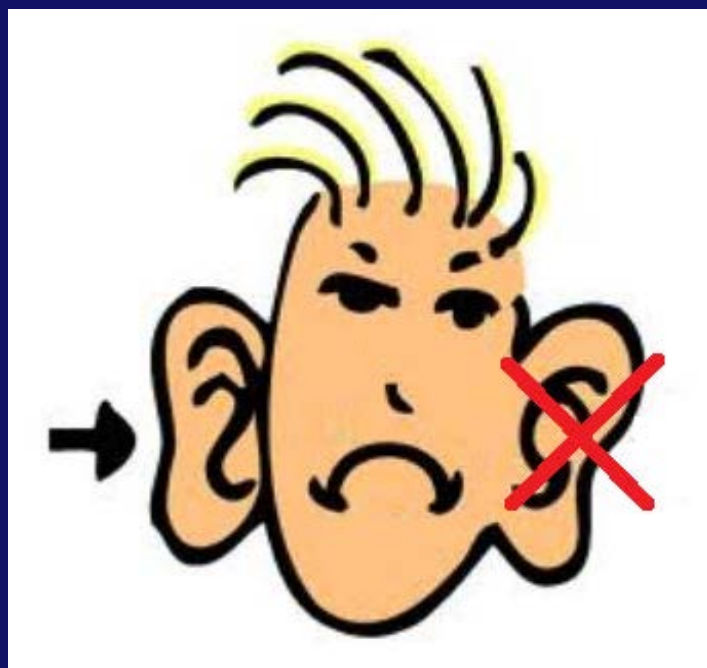
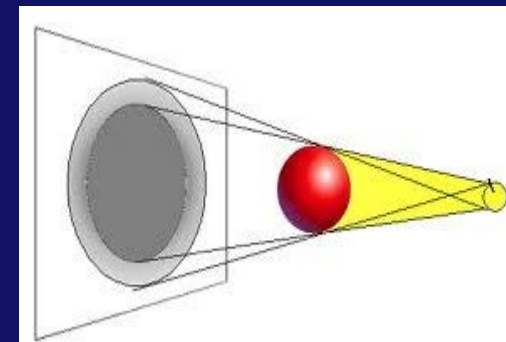
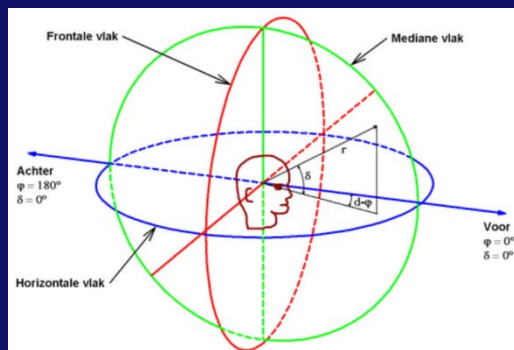
LEIDEN UNIVERSITY MEDICAL CENTER

*Triage*  
*to*  
*CROS hearing aid*  
*or*  
*Bone Conduction Device*  
*of*  
*Patients with SSD*

**Wim Soede**  
**Johan H.M. Frijns**



# Challenging situations for patients with Single Sided Deafness



## Challenge

- Directional hearing (binaural)
- Intelligibility in noise (binaural)
- Headshadow (mono)

## A selection of literature

- Transcranial contralateral cochlear stimulation in unilateral deafness.  
Wazen JJ, Spitzer JB, Ghossaini SN, et al. *Otolaryngol Head Neck Surg* 2003;129(3):248-54.
- Bone-anchored hearing aids in unilateral inner ear deafness: an evaluation of audiometric and patient outcome measurements.  
Hol MK, Bosman AJ, Snik AF, Mylanus EA, Cremers CW. *Otol Neurotol* 2005;26(5):999-1006.
- Subjective benefit after Baha System application in patients with congenital unilateral conductive hearing impairment.  
Kunst, Hol, Mylanus, Leijendeckers, Snik, Cremers, *Otol Neurotol*, 2008
- BAHA in SSD: patient compliance and subjective benefit (20%)  
Schrøder, Rayn, Bonding, *Otol Neurotol*, 2010)
- Benefit of BAHA in the elderly with SSD,  
Faber, de Wolf, Cremers, Snik, Hol, *Eur Arch Otorhinaryngoly*, 2013

## The Cochlear BAHA selection guide

- **Claim BAHA:**

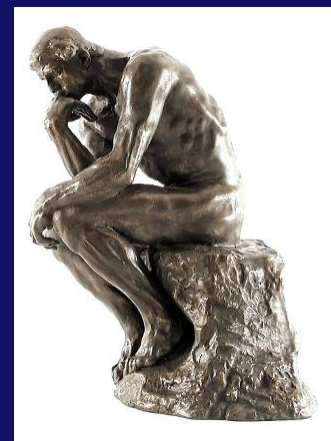
In SSD, Baha bypasses the deaf ear entirely and delivers sound directly to the hearing ear's cochlea. This overcomes the head shadow effect leading to improved speech understanding and 360-degree sound awareness.

- **Disclaimer CROS:**

The Baha solution not only offers great sound, there is also no occlusion of the hearing ear. Patients avoid drawbacks like cables associated with CROS (contralateral routing of signals) devices.

- **So let's implant or ...?**

- 2002 SSD Trial (together with Nijmegen)
- Main purpose: audiological evaluation
- Comparison with convential CROS (wired)
- 7 people involved in Leiden:
  - 1 very positive result (professional singer)
  - 4 neutral/”positive”
  - 2 negative, abutment removed
- Our conclusion:
  - insufficient triage and setting of expectations



1. Interview on the experienced audiological problems by the patient after surgery
2. Audiological explanation SSD:
  - Any solution is a monaural
  - Head-effect (may help in car, meeting, restaurant)
  - Directional hearing (no improvement to expect)
  - Speech in noise (may help in special situations)
3. Trial with CROS-hearing aid 8 weeks (wireless, thin-tube!)



## *Our Triage procedure (audiological center)*

1. Interview experienced audiological problems after surgery
2. Audiological explanation SSD:
  - Any solution is a monaural
  - Head-effect (may help in car, meeting, restaurant)
  - Directional hearing (no improvement to expect)
  - Speech in noise (may help in special situations)
3. Trial with CROS-hearing aid 8 weeks (Unitron/Phonak)

- 
4. Evaluation in Audiological Center  
(stop, keep CROS, continue with BAHA/Ponto)
  5. Trial with BAHA/Ponto  
(1 week, they know the situations to evaluate)



- 
6. Final Decision
    - No HA
    - CROS
    - BAHA/Ponto

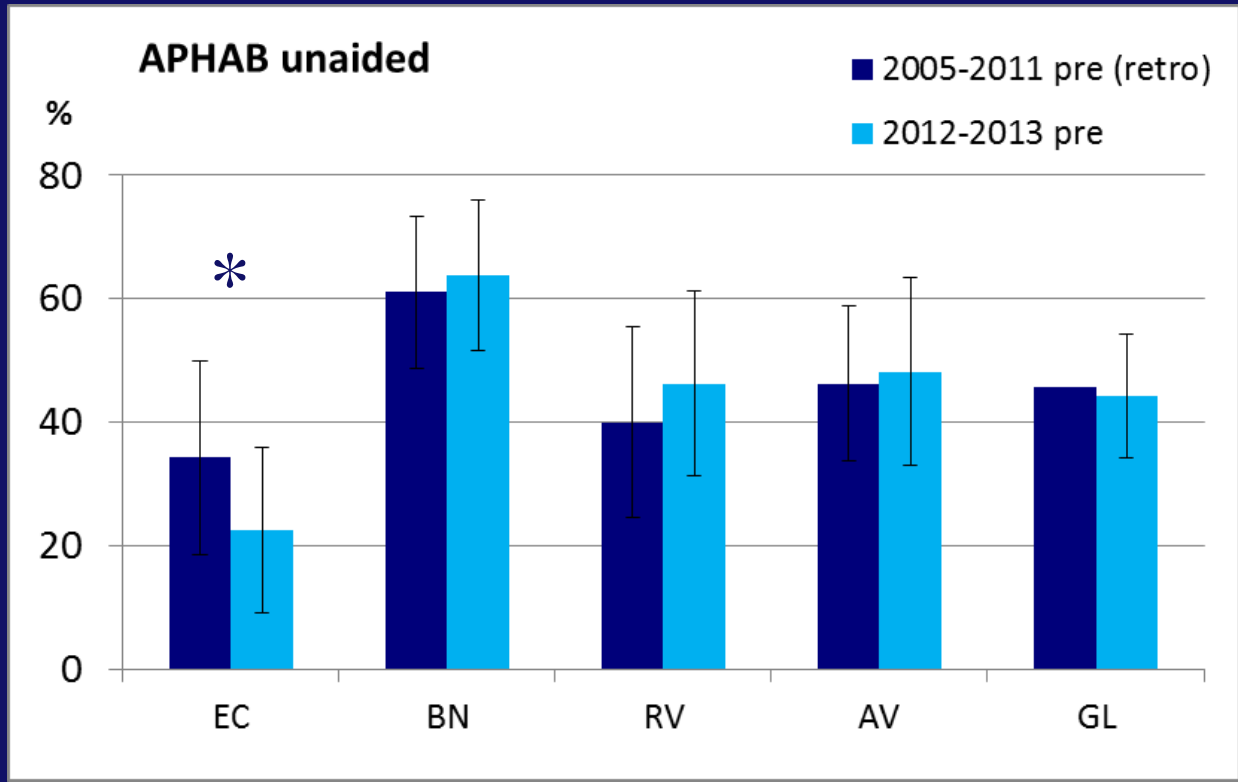


- Group 2005-2011 (N=65)
  - Survey carried out in 2011
  - APHAB Retrospective difference no HA versus CROS/BAHA (36/65)
  - (70% use more than 8 hours a day)
  
- Group 2012-2013 (N=38)
  - APHAB no HA @ 1<sup>st</sup> consultation (38/38)
  - APHAB CROS @ 2<sup>nd</sup> consultation (16/38)



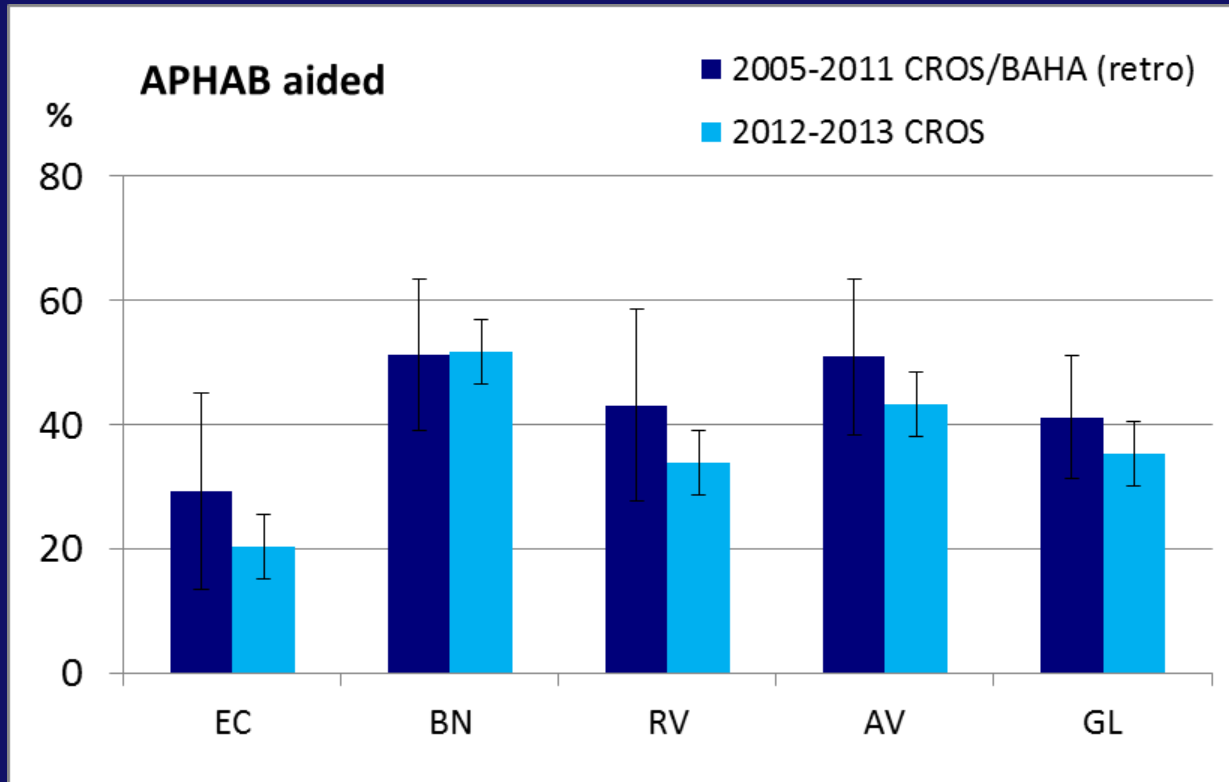
	2005-2013	Total
BAHA/Ponto	25	24%
CROS (wireless)	31	30%
No-HA	36	35%
Unknown	11	11%
Total	103	

EC Significant difference retro versus pro



Ease Communication	Background Noise	Reverberation	Aversiveness	Average EC/BN/RV
-----------------------	---------------------	---------------	--------------	---------------------

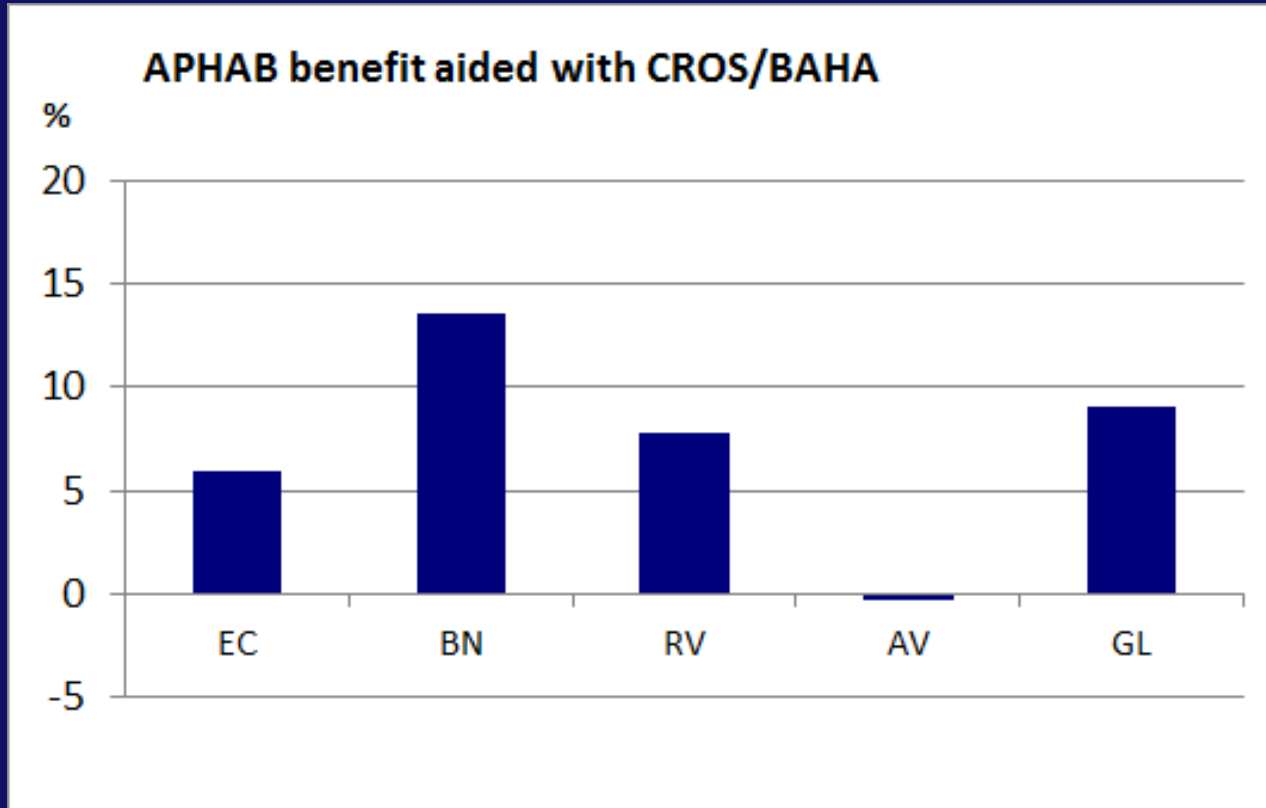
No significant differences between groups



Ease Communication	Background Noise	Reverberation	Aversiveness	Average EC/BN/RV
-----------------------	---------------------	---------------	--------------	---------------------

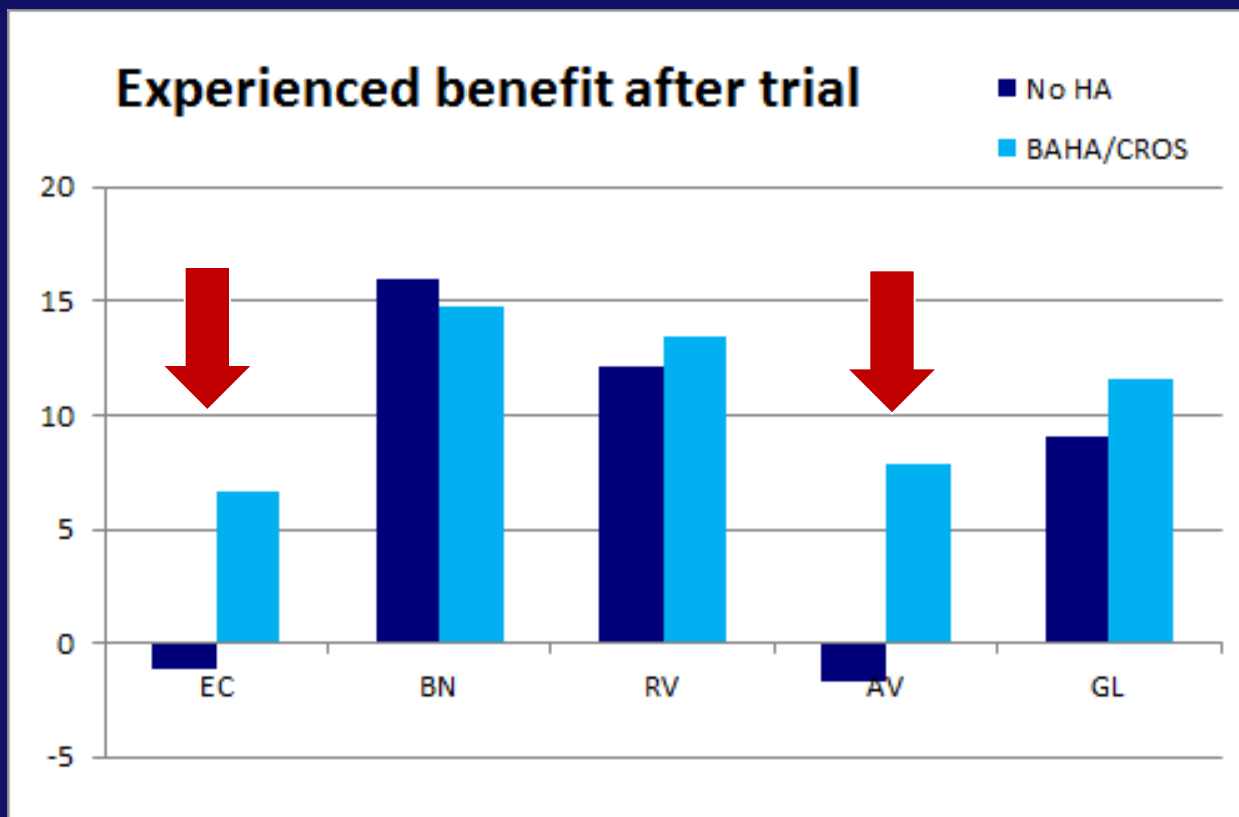
# Benefit based on APHAB (31 CROS+6 BAHA)

No significant difference type CROS/BAHA/Ponto



Ease Communication	Background Noise	Reverberation	Aversiveness	Average EC/BN/RV
-----------------------	---------------------	---------------	--------------	---------------------

APHAB Group 2012-2013  
results splitted based on final choice



Ease Communication	Background Noise	Reverberation	Aversiveness	Average EC/BN/RV
-----------------------	---------------------	---------------	--------------	---------------------

## Male/Female differences 2005-2013

	Male	Female
Total	33%	67%
	↓ ♂	↓ ♀
BAHA/Ponto	16%	27%
CROS	42%	22%
No HA/Unknown	42%	51%



• Triage



- Information, set expectations
- Test CROS 2 months (continue yes/no)
- Test BAHA/Ponto headband 1 week (decision yes/no)

• APHAB (pre-post)

- Improvement 8-14%
- Choice No-HA

• Background Noise and Reverberation

• Ease Conversation and Aversiveness

• Claim benefit for CROS:

- Triage include CROS (wireless/open)
- CROS helps another group of SSD-patients



BAHA/Ponto	CROS	No-Ha
24%	30%	46%

(compare 20% Schröder, 2010)



- PACT-advies
- CROS is adequate functiegerichte verstrekking (CvZ advies van februari 2013)
- Een klassiek draadgebonden oplossing is géén adequate verstrekking
- Verstrekking 1<sup>e</sup> CROS systeem in overeenstemming met NOAH protocol via Audiologisch Centrum

- ZN, Nieuwsbrief december 2013 (zn.nl thema hoorzorg)

De PACT verzoekt de zorgverzekeraars om een standpunt in te nemen. Deze notitie is besproken in de werkgroep protocollering. Alle verzekeraars geven aan dat een Cros toestel behoort tot een hooroplossing die valt onder de functionele aanspraak. Zowel een draadloos als draadgebonden systeem kan een adequate oplossing zijn. Zorgverzekeraars maken individueel beleid op de vergoeding van een Cros toestel en leggen dit individueel vast in de afspraken die ze maken met audicienbedrijven. Afgesproken is dat elke zorgverzekeraar zelf zijn beleid communiceert.

- Stand van zaken januari 2014
  - CROS is functiegericht 😊
  - Draadgebonden CROS adequaat? 😞
  - Diverse contracten audicien-verzekeraars: “niet leverbaar” 😞
- Gebruik maken van bijzondere zorgvraag én bezwaar/beroep
- Problemen/klachten melden bij verzekeraar en FENAC