The Ponto 3 Sound Processor Family: Proven technology to Make Listening Easier

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Agenda

0-5 minutes  Introduction
5-15 minutes  BrainHearing™ and evidence
15-30 minutes  Sound Quality: Output, Bandwidth, Clarity
30-45 minutes  Fitting with Genie Medical 2016.1
45-55 minutes  Pediatrics: Softband and DSL-BC
55-60 minutes  Q & A
Learning Objectives

• After this course learners will be able to describe the fitting range and features of the Ponto 3 sound processors.
• After this course learners will be able to explain how Direct Sound Transmission and INIUM Sense Processing contribute to BrainHearing.
• After this course learners will be able to describe the importance of Output, Bandwidth and Clarity for BAHS patients.

Ponto 3 – The Definition of Power

The most powerful family of abutment-level sound processors

- Ponto 3
  - 45 dB HL
- Ponto 3 Power
  - 55 dB HL
- Ponto 3 SuperPower
  - 65 dB HL
Ponto 3 delivers new success factors for even better patient outcomes

Power your Brain
• Introducing BrainHearing™ for BAHS

Powerful sound quality
• Highest output ever from an abutment level soundprocessor
• Widest frequency bandwidth
• 15% better speech understanding in 70% of time

Empowering children
• First ever DSL-BC
• New Ponto Softband

BrainHearing™ for BAHS
Ponto 3 – Power your brain

The most important part of hearing

- Orient: The brain uses all auditory input to orient itself about its sound environment.
- Separate: The brain compares the sounds it receives in order to separate them.
- Focus: The brain has to know where to focus in noisy sound environments.
- Recognise: The brain recognises sounds based on experience and gathers meanings from what it hears.

BrainHearing™ is about a fundamental understanding of how hearing works – and how the brain makes sense of sound.

Ponto 3 – Power your brain

Introducing BrainHearing™ for BAHS

- Hearing loss or poor sound quality puts an extra strain on the brain that has to work harder.
- BrainHearing™ is about designing hearing devices to make listening easy.
- We provide audibility and signal processing that supports the brain’s cognitive processes:

  - **Direct Sound Transmission**
  - **Inium Sense platform**

These are the prerequisite for delivering the output, bandwidth and clarity users need to experience powerful sound quality.
Direct Sound Transmission

SWIR test
Sentence – final Word Identification and Recall

Cognitive Outcome Measure
at Ecological Signal-to-Noise Ratios

Method, SWIR test

Task: repeat last word (of 7 sentences)
1. Her går alle med
2. Han ligger stadig i
3. Eleven skriver en lang
4. Hele byen kom til
5. Hans datter vil på
6. I går havde filmen
7. Fabrikkens port var ikke

Task: recall final words


Method

Ponto Plus Power optimally fitted on abutment and softband

Speaker setup

Results

Recall is significantly better for abutment compared to softband fitting

(\(n=16\))

\[ P = 0.015 \]

13% improvement of words correctly recalled

Recall is significantly better for abutment compared to softband fitting

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Direct Sound Transmission

Inium Sense platform

These are the prerequisite for delivering the output, bandwidth and clarity users need to experience powerful sound quality
Sounds Are Vitamins For The Brain

Output – more loud and soft sounds

Bandwidth – greater range of high and low tones

Clarity – without distortion

Powerful sound quality
Output, Bandwidth, Clarity
Output

Ponto 3 – Powerful sound quality

Highest abutment-level output ever

We are continuously making Ponto more powerful

14 dB higher max output

Maximum force output level at 90 dB SPL input

<table>
<thead>
<tr>
<th>Frequency [Hz]</th>
<th>Force output [dB µN]</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>60</td>
</tr>
<tr>
<td>1000</td>
<td>90</td>
</tr>
<tr>
<td>10000</td>
<td>120</td>
</tr>
</tbody>
</table>

Because sound matters
Ponto 3 – Powerful sound quality
Is There a Risk of Over Amplification?

Objective measurement of the MPO of several hearing devices:

<table>
<thead>
<tr>
<th>Device</th>
<th>Measured MPO</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sophono Alpha 3</td>
<td>50 dB HL</td>
<td>Hulst, et al., 2013</td>
</tr>
<tr>
<td>Streameridge</td>
<td>45 dB HL</td>
<td>Meertens, 2016</td>
</tr>
<tr>
<td>Standard Baha (Stream / MPx)</td>
<td>67 dB HL</td>
<td>Lankhoff &amp; Motschsuch, 2013; Zwanenburg et al., 2014</td>
</tr>
<tr>
<td>Ponto Pro</td>
<td>67 dB HL</td>
<td>Zwanenburg, 2014</td>
</tr>
<tr>
<td>Baha Carefree</td>
<td>60 dB HL</td>
<td>Zwanenburg, 2014</td>
</tr>
</tbody>
</table>

http://www.snikimplants.nl

SuperPower
as we know it in traditional hearing aids

Associated with ...

- High max. power
- Big hearing losses

Does this also apply to BAHS?
Ponto 3 SuperPower

To be associated with ...

- High max. power output (MPO)

Every BAHS patient can benefit from the higher MFO in SuperPower

- Will conductive losses get too much amplification?
  - No, prescribed gain is equal in the three devices.
  - Every BAHS patient can benefit from the higher MFO in SuperPower
Ponto 3 – SuperPower made beautiful
All candidates benefit from higher output!

The Ponto 3 SuperPower changes it all.....

All candidates benefit from more power and higher output – LOUD sounds should sound LOUD!
• Softband and headband users - remember skin attenuation
• For SSD - to match their normal loudness perception in best ear
• For all moderate / severe loss beyond 30 dB HL
• For progressive loss - remember longevity

Ponto 3 SuperPower

Conductive
Mixed / SSD
Ponto 3: Industry’s widest bandwidth

38 % wider frequency bandwidth

Bandwidth Ponto 3
200-9500 Hz*

Bandwidth other bone anchored device
250-7000 Hz*

*Linear comparison of equivalent bone anchored sound processors.
The perceptual performance has not been evaluated.
The importance of high frequency

- Task: Learn 5 new words
- 2 groups of children,
  - one listened to limited bandwidth -> 4.6kHz
  - the other listened to extended bandwidth -> 9 kHz
- Research question: How many trials do they need to be able to pair the word and picture correct?


The importance of extended bandwidth

Results:

Children learn new words **3 times quicker with extended bandwidth** compared to the children who listen to limited bandwidth.


*The study included both normal hearing and hearing impaired children who were exposed to limited and extended bandwidth. No conclusion can be drawn from this study with regards to Ponto 3.*
Clarity

Ponto 3 – Powerful sound quality
FreeFocus optimised directionality

- Brain hearing leads us to focus on improving the situations that matter the most

A typical user spends 70% of time in Omni mode
FreeFocus test

*Objective:* Compare the subjective and objective outcome of the Free Focus directionality system in Ponto 3 to the directionality system in Ponto Plus

*Design:*
- 19 adult patients (conductive (5), mixed (9) and SSD(5)), all using Ponto Plus prior to test
- Test devices: Ponto 3 /Ponto Plus, Ponto 3 Power/Ponto Plus Power
- Test Speech Focused in laboratory, Automatic Tri-mode in real life.
- Outcome measures:
  - Speech in Noise test (Dantale II), loudspeaker set-up: S,N +/-110, 180
  - SSQ

Evidence

Speech Focused mode

1.1 dB improved SNR with Ponto 3 over Ponto Plus.

1.1 dB ~ 15% improved speech intelligibility
Evidence
Speech Focused mode

Patients experienced significant improved speech understanding and spatial perception with Ponto 3 over Ponto Plus.

FreeFocus feature test report (2016), Oticon Medical report no 34425-00

What do patients say about Ponto 3?

“Generally better speech understanding”

“I hear better at work” (as photographer)

“Hear more clearly what the other passengers in the bus are talking about”

“Other people tell me that I hear better, I also feel it myself”

“Better speech understanding”

Clearer speech understanding
FreeFocus directionality system

- FreeFocus:
  - **15%** better speech understanding with Speech Focused mode.

- A typical user spends more than **70%** of the time in Speech Focused mode. This brings users significantly better speech understanding in the majority of everyday listening situations.
Genie Medical

Genie Medical 2016.1 Release overview
Product introduction / features

- Ponto 3 family and fitting range
- DSL-BC fitting rationale
- Binaural Coordination
- FLogram
- FreeFocus
- Binaural Synchronisation
- Fitting Assistant

- Recommend fitting flow is updated
Recommended Fitting flow

The fitting flow is:

1. Detect sound processor
2. Select type of fitting:
   - Single-sided deafness
   - Softband
3. Measure Feedback limit
4. Measure BC In-situ

Hand-out Oticon Medical Streamer
(don’t need to do anything in Genie Medical)

Ponto 3 family and fitting range

- Ponto 3
- Ponto 3 Power
- Ponto 3 SuperPower

Fitting range

<table>
<thead>
<tr>
<th>Conductive / mixed HL</th>
<th>Single-Sided Deafness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conductive</td>
<td>SSD</td>
</tr>
<tr>
<td>Mixed</td>
<td></td>
</tr>
</tbody>
</table>

The order is changed:
run the Feedback Manager before BC In-situ.
Ponto 3 family
All candidates benefit from higher output!

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• Softband and headband users - remember skin attenuation
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DSL-BC fitting rationale

DSL-BC available in all Ponto devices:
• Ponto Pro
• Ponto Plus
• Ponto 3

• Preferences
Audiologists can choose which rationale should be the default
**FLogram**

- FLogram is a new way to look at a fitting / prescription.

![FLogram graph](image)

**FLogram in Genie Medical**

- FLogram is for bone anchored devices what SPLLogram is for AC hearing aids

![FLogram in Genie Medical](image)

- FLogram is a graph option; the setting of the sound processor is the same no matter which graph is selected.
FLogram in Genie Medical

- FLogram makes it easy to judge audibility, see and compare:
  - The patient’s BC hearing threshold as measured with BC In-situ
  - Max Force Output of the device and
  - Aided Normal Speech spectrum

Hearing threshold level in FLogram

- 0 dB HL* = RETFL
  *) measured with direct sound transmission via abutment

- RETFL = Reference Equivalent Threshold Force Level (for direct bone conduction transmission), normal hearing reference.¹

FreeFocus

• Four FreeFocus modes:
  - Optimized Omni
  - Speech Focused
  - Split Directional
  - Full Directional

  2 Surround modes:
  - Speech Focused - default
  - Select Optimized Omni for patients who require increased loudness.

Binaural Synchronization

• 'Binaural Broadband' ensures that Directional modes and noise reduction states are synchronized to be the same in left and right devices.
Binaural Coordination

• The operation of one device affects the other in the same way

Volume control
Changing program
Muting the device

Fitting Assistant

• A new tool to easily fine tune the sound processor

• Generally little need for fine tuning, but if needed likely the controls can provide ‘guidance’.

• The controls are designed specifically for the challenges in BAHS prescriptions and fittings.
Fitting Assistant controls

• **Soft Sound Perception**
  - increases HF Soft

• **LF Compression Ratio (CR)**
  - increases CR, by reducing gain at moderate and loud level

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Fitting Assistant controls

• **LF Roll-off**
  - decreases LF gain
Ponto 3 – Power to participate

Proven Wireless Connectivity

- Wireless connectivity that does not compromise on power

Empowering children

New Softband and DSL-BC
The new Ponto Softband

Designed to stand up for high activity levels, be comfortable to wear and still meet the high standards of safety.

Empowering children

The new Ponto Softband & SoundConnector™

- Widest colour option
- New wearing option
- Flexible
- Comfortable
- Safe
- Proven performance
- Extended wearing options
Flexible – for different needs

• Adjustable to most headsizes
• Unilateral & bilateral in one solution

New wearing option

• Ponto SoundConnector™
• For cap or headwear
• Tamperproof
• Reassuring "click"
• Also sold as single item
Widest design options

- New softband colors, skins, and stickers!
First ever DSL-BC

The well-known DSL fitting rationale is now **tailor-made for BAHS**, called DSL-BC.

For the **first time ever** implemented in BAHS!

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DSL-BC for BAHS

- Build on DSL v5.0 m[i/o] concept: Map the natural dynamic range to the patient's dynamic range (residual auditory area).

- Input parameters to DSL-BC:
  - BC In-situ hearing threshold
  - _Sound processors’ MFO_
  - _RHCD (Real Head to Coupler Differences)_
    - determines the patients’ Dynamic Range

- And the amplification is prescribed

*Product specific information already in Genie Medical*
DSL-BC

- Adult and Pediatric version

Documentation on DSL-BC

- Susan Scollie and Bill Hodgetts have followed and approved / accredited our implementation

- Paper on DSL-BC is submitted by Scollie et al.
DSL-BC for BAHS

- Compared to NAL-NL1 in Ponto, DSL-BC provides:
  - Less LF amplification
  - Less amplification for conductive HL
  - Some higher amplification (and CR) for larger mixed HL

DSL-BC

- Accessible in all Ponto devices!
  - Ponto Pro
  - Ponto Plus
  - Ponto 3

- First ever DSL-BC in BAHS fitting software!!
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**Empowering children**
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- New Ponto Softband
Ponto 3 - SuperPower made beautiful
The world’s first single-unit SuperPower

- Ponto 3 SuperPower combines a discreet, small design and a battery that lasts.
- Abutment-level processor - no strings or need for any bulky ear- or body-worn devices

Questions?