SONIC | pep

Step up with
pep

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What is Pep?
'Pep' is that energetic feeling you get when life is great and you are ready to take on the world. It's the feeling your patients get when taking the first step to better hearing with Pep.

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Pep Highlights

- Pep is ideal for the first-time user and for patients with basic hearing needs.
- Provides processing features essential to improved listening comfort and improved overall hearing ability
- Includes features for patient convenience
- 5 Models – BTE and Custom options

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Features

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Keeping Sound Natural

- **Pep uses Speech Variable Processing (SVP), a fast-acting WDRC system designed to replicate the functions performed by a healthy cochlear amplifier.**

- **Benefit:**
  Preserves subtle nuances of speech, making sound clear and natural in a variety of listening situations.
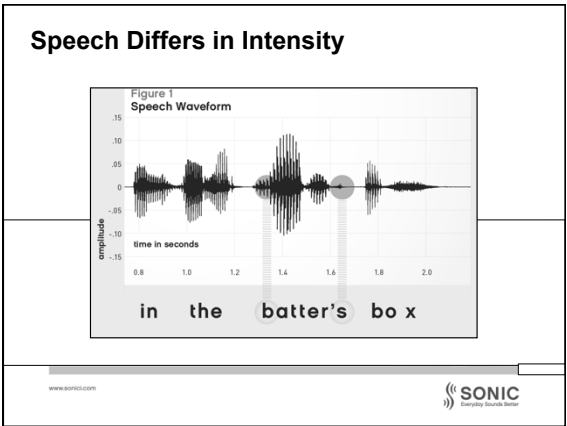
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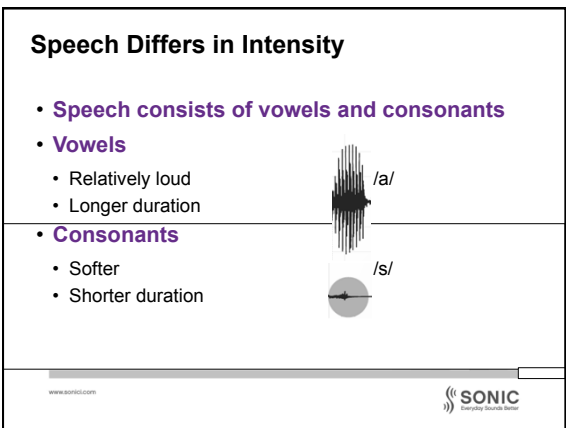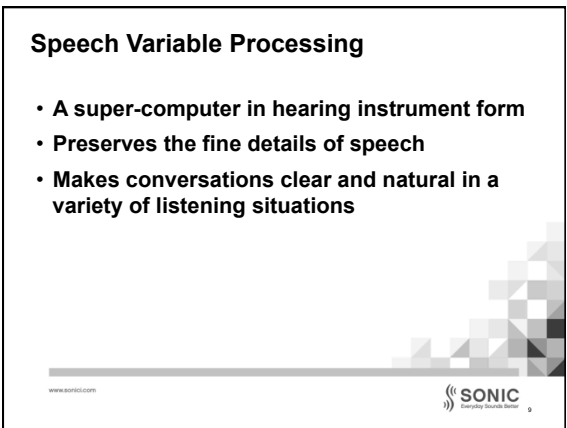Everyday Sounds Better

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A Word About Speech

- **Speech is complex and dynamic**
  - Patterns and sounds vary all the time
  - Components may be quick or slow
  - Have different levels of energy as vocal inflections rise and fall

- **Our ears translate these things naturally**

- **A hearing device requires sophisticated technology to process speech accurately**
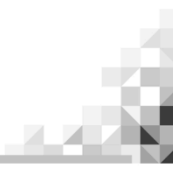
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Speech Differs in Intensity

Figure 1
Speech Waveform

in   the   batter's   bo x

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Speech Differs in Intensity

- **Speech consists of vowels and consonants**
- **Vowels**
  - Relatively loud   /a/
  - Longer duration
- **Consonants**
  - Softer   /s/
  - Shorter duration

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Speech Variable Processing

- **A super-computer in hearing instrument form**
- **Preserves the fine details of speech**
- **Makes conversations clear and natural in a variety of listening situations**

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Three Key Components of SVP

- Speed
- Frequency Contrast
- Precision Frequency Shaping

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Three Key Components of SVP

- Speed
- Frequency Contrast
- Precision Frequency Shaping

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Speed is Key to Accuracy

- **A healthy cochlea:**
  - Analyzes and adjusts amplification of sound very quickly
  - This speed is key to maintaining natural sound quality

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Speed is Key to Accuracy

- **SVP attempts to replicate this behavior in two ways:**
  - Quickly and accurately measures the input level of the incoming signal.
  - Applies the correct amount of amplification, for just the right amount of time, at just the right frequency.
- **Every component of speech receives the correct amount of gain**

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Traditional Multichannel Systems

- **Commonly slow-acting systems**
- **Not fast enough**
  - To detect differences in intensity
  - To apply gain to the appropriate speech sound
- **Application of gain**
  - Homogenous
  - Often incorrect – especially for very soft speech sounds

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Three Key Components of SVP

- **Speed**
- **Frequency Contrast**
- **Precision Frequency Shaping**

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Frequency Contrast

- **A healthy cochlea:**
  - Amplifies sound in such a way that natural level differences across frequencies is preserved
  - Frequency Contrast is maintained
  - Critical for speech clarity

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Frequency Contrast

- **SVP preserves Frequency Contrast**
  - Measures and applies gain to the wideband acoustic signal.
- **The signal is never measured and adjusted in separate frequency regions**

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Traditional Multichannel Systems

- **Gain is applied in individual bands and recombined**
- **Consequences of applying gain in separate bands**
  - Spectrum can be flattened
  - Eliminates the contrast inherent in the signal

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Three Key Components of SVP

- **Speed**
- **Frequency Contrast**
- **Precision Frequency Shaping**

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Precision Frequency Shaping

- **Independent application of gain at any frequency, not just within a specified channel**
- **Result?**
  - Continuously variable compression ratio across all frequencies
  - Provides a very high quality, natural sound

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Traditional Multichannel Systems

- **Adjusts gain in each channel**
  - *Within* a channel, the gain is fixed
- **If the prescribed gain is significantly different across channels:**
  - Drastic changes in compression
  - Results in less than optimal sound quality

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Conclusion - Speed

Speech Variable Processing	Traditional Systems
• Fast analysis of input signal	• Slow analysis of input signal
• Can accurately detect rapid intensity differences	• Cannot accurately detect very quick intensity differences
• Applies correct amount of gain to **each** speech sound	• Applies homogenous amount of gain – soft sounds don't get enough amplification

• **Benefit – better speech understanding**

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Conclusion – Frequency Contrast

Speech Variable Processing	Traditional Systems
• Wideband acoustic signal is measured	• Signal is divided into many separate frequency regions
• Gain is applied to the entire signal	• Gain is adjusted in many frequency regions
• Contrasts within the signal is maintained	• Flattening of speech spectrum

• **Benefit – improved speech clarity**

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Conclusion – Frequency Shaping

Speech Variable Processing	Traditional Systems
• Gain is not applied within a channel	• Gain only adjusted within a specified channel
• Independent application of gain at every frequency	• Gain applied within a channel is fixed
• Continuously variable compression ratio across all frequencies	• Results in less than optimal sound quality

• **Benefit – improved speech clarity**

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Focusing on the Speaker

- **Pep features a fixed,** hypercardioid directional response to reduce sounds coming from the sides and behind.
- **Benefit:** Increased focus on sounds from the front (typically the speaker)
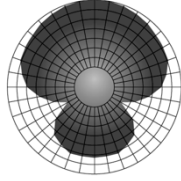
BTE, ITCD Models

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Providing Comfort in Noise

- **Soft Noise Reduction uses expansion to manage the amplification of low input level sounds, while preserving the input in frequencies where speech is dominant.**
- **Benefit:** Reduces soft, low-level sounds without modifying the amplification of important speech-related signals

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Providing Comfort in Noise

- **Adaptive Noise Reduction reduces gain only in frequencies where speech is not present.**
- **Benefit:** Preserves speech clarity while providing comfort.

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Stopping Whistle and Squeal

- **The Adaptive Feedback Canceller in Pep generates a signal of magnitude equal to and opposite in phase to detected feedback, then applies it to cancel out the feedback signal.**
- **Benefit:**
  Cancels feedback without reducing gain, providing more overall gain for the patient.

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Listening Programs

- **3 configurable listening programs (+DAI/FM for BTE, Power BTE)**

	Universal	Telephone	Television	DAI/FM
Adaptive NR	Medium	Medium	Off	Medium
Directionality	• Omni or Fixed Directional (BTE, ITCD) • Omni (ITC, CIC) • Dual Omni (Power BTE)	• Omni (BTE, ITCD, ITC, CIC) • Dual Omni (Power BTE)	• Omni (BTE, ITCD, ITC, CIC) • Dual Omni (Power BTE)	• Omni (BTE, ITCD, ITC, CIC) • Dual Omni (Power BTE)
Other		Configurable Mic / Telecoil Mix		Configurable Mic / DAI Mix

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Available Models

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Model Feature Summary

	Power BTE	BTE	ITCD	ITC	CIC
Program Button	■	■	●	●	
Volume Control	■	■	●	●	
Directionality	Dual Omni	■	■		
Telecoil	■	■	●	●	
DAI/FM	■	■			
Open Fit Options	■	■			
Battery Size	13	13	312	312	10

■ Standard
● Optional

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Color Options

BTE Models

Beige   Dark Brown   Black   Grey

Bottom shell black on all BTE models

Custom Models

Beige   Light Brown   Med. Brown   Dark Brown

Brown devices made with clear shells

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BTE Acoustic Options

- **The BTE and Power BTE can be fit with either an earhook or thin tube**

Earhook	Connects to	Ear piece options
	Tubing	Custom mold
Thin Tube	**Connects to**	**Ear piece options**
	Thin Tube (2 sizes)	Domes (5 options) Custom mold

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BTE Thin Tube Options
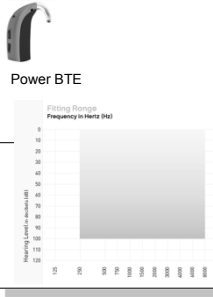
	0.9 mm	1.3 mm		Open Dome	Tulip Dome	Dome, Small Vent	Dome, Large Vent	Power Dome
XS (6 mm)				■				■
S (8 mm)				■		■	■	■
M (10 mm)				■		■	■	■
L (12 mm)					■	■	■	

Provides increased low and mid frequencies
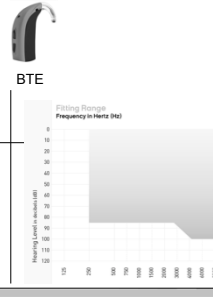
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BTE Fitting Ranges

Power BTE

BTE
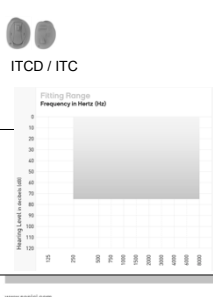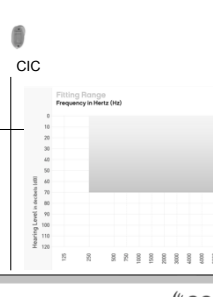
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Custom Model Fitting Ranges

ITCD / ITC

CIC

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Feature Summary

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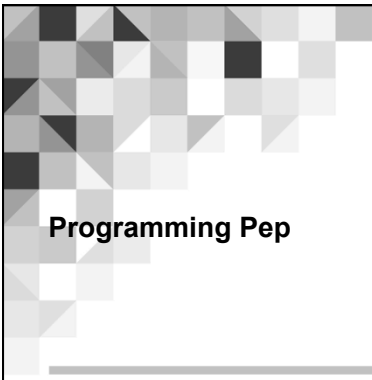
Feature Summary

	Power BTE	BTE	ITCD	ITC	CIC
Sound Quality					
Signal Processing	<-------------------- Speech Variable Processing -------------------->				
Frequency Bandwidth	---------------------------------- 8 kHz ---------------------------------->				
Noise Management					
Adaptive Noise Reduction	■	■	■	■	■
Soft Noise Reduction	■	■	■	■	■
Adaptive Feedback Canceller	■	■	■	■	■
Directionality					
Dual Omni	■				
Fixed Omni		■	■	■	■
Fixed Directional		■	■		
Programming Options					
Universal Program	■	■	■	■	■
Program Memories	3	3	3	3	1
Program Options	3+1*	3+1*	3	3	3

■ Standard
*Compatible with DAI/FM

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Programming Pep

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What You'll Need…

- **EXPRESS*fit* 2012.1 or later**
- **HI-PRO, NoahLink, or EXPRESS*link*[3]**
- **#2 Programming Cables**
- **For BTEs:**
  - Programming Adapter
- **For Customs:**
  - ITCD – flex strip with programming pill
  - ITC, CIC – flex strip

BTEs: Connect the Programming Adapter

1. **Open the battery door and slide the programming adapter into the slot until it lines up with the instrument.**
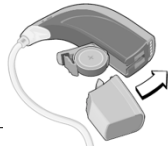
BTEs: Connect the Programming Adapter

2. **Close the battery door (with a fresh battery) and plug the cable into the programming socket.**

14

Customs: Insert the Flex Strip (ITCD)

1. **Insert the battery pill with the red indicator pointing to the + sign.**
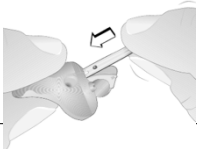2. ~~**Close the battery door.**~~

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Customs: Insert the Flex Strip (ITC, CIC)

1. **Insert a fresh battery.**
2. **Open the battery door slightly. With the black dot facing up, insert the end of the Flex Strip into the space between the battery door and the hinge until the black dot touches the faceplate.**
3. **Close the battery door.**

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First Fit Protocol

- **Success with a hearing instrument largely depends on the time you have for counseling**
- **Using our First Fit Protocol, you'll have more time with your patient to ensure success from the very start**

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Step 1: Detect Instruments

Simulate a Pep device

Click the Detect button to program attached devices

Click the arrow to change the programmer

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Step 2: Verify Acoustics

Patient's insertion gain shown in relation to selected device acoustics

Change acoustics to match physical configuration of the device

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Step 3: Verify Client Info

Set the appropriate Gender

Select an appropriate Experience Level

Use the Best Fit Fast Fitting Rationale

Enter RECD or REUG, if available

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Step 4: Manage Programs

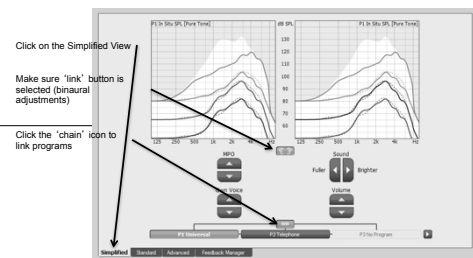

Configure programs as desired

Adjust Features, if desired.
(Adjust M/T mix on this screen)

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Step 5: Prepare for Paper Crinkle Test

Click on the Simplified View

Make sure 'link' button is selected (binaural adjustments)

Click the 'chain' icon to link programs

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Step 6: Perform Paper Crinkle Test

Steps:

• Give the patient a piece of paper and ask them to crinkle it.

• If it sounds like paper, Use the Volume Up button to increase overall volume by 2 dB.

• Repeat until the patient says the crinkling sounds like plastic or foil, then use the Volume Down button to reduce overall volume by 2 dB (or a maximum of 4 increases, whichever happens first)

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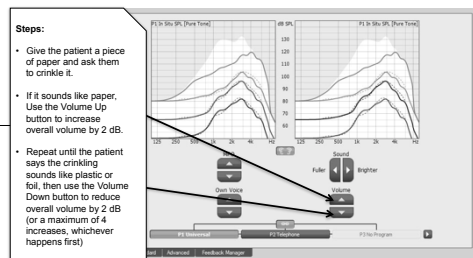
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Step 7: Measure Feedback Limits

Click Measure and follow the on-screen instructions

Step 8: Finish Session

Configure controls as desired

Demonstrate audible indicators to the patient

Enter comments and save

First Fit in Action!