

The Science Supporting Sky Lumity

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Account Manager, Children's Hospitals & Schools

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The Science Supporting Sky Lumity.

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Learning Objectives

- After this course, participants will be able to list the features of Sky Lumity.
- After this course, participants will be able to describe the benefits of Dynamic Noise Cancellation and Tap Control.
- After this course, participants will be able to explain when they would utilize Tap Control.

Phonak and pediatrics



A Lumity solution for pediatrics



50 years of commitment to
pediatric solutions



Speech understanding
with innovative technology



Connectivity



Designed for young users



Conversations shine for everyone with Phonak Sky Lumity

Sky L
(M, PR, SP, UP)



NEW

All Sky form factors to meet the needs of any pediatric patient



Sky Lumity is the winner of the Hearing Technology Innovator 2023 award in the **BTE hearing aid** category



SmartSpeech Technology with our most advanced feature-set to date



Universal connectivity for improved access to speech



Fun colors children can mix and match to show off their uniqueness



myPhonak Junior for personalization, convenience & peace of mind

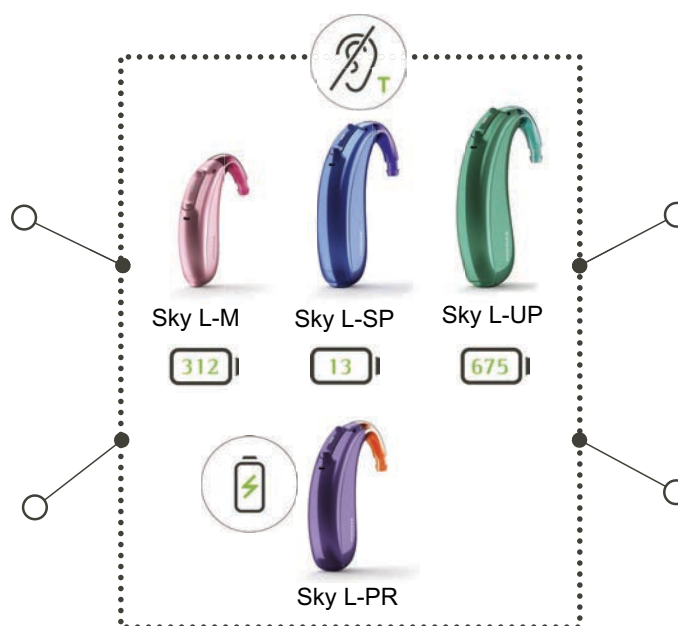


Phonak Sky™ Lumity●

Sky under the Lumity hood

- AutoSense Sky OS 5.0
- StereoZoom 2.0
- Speech Enhancer
- SpeechSensor
- Dynamic Noise Cancellation
- Motion Sensor Hearing*
- RogerDirect™

- CROS L-R compatible*
- Tap Control*



- Universal Bluetooth® connectivity
- myPhonak Junior app
- Wearing time and Remote Support

- Robust and reliable housing
- Stylish color range
- Tamper-proofing options
- LED visual indicator
- Pediatric workflow

*Sky L-PR only

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Sky Lumity: Colors

Popular pediatric colors



Velvet Black



Electric Green



Caribbean Pirate



Majesty Purple



Precious Pink



Lava Red



Blue Ocean

Standard colors



Beige



Sand Beige



Sandalwood



Chestnut



Champagne



Silver Gray

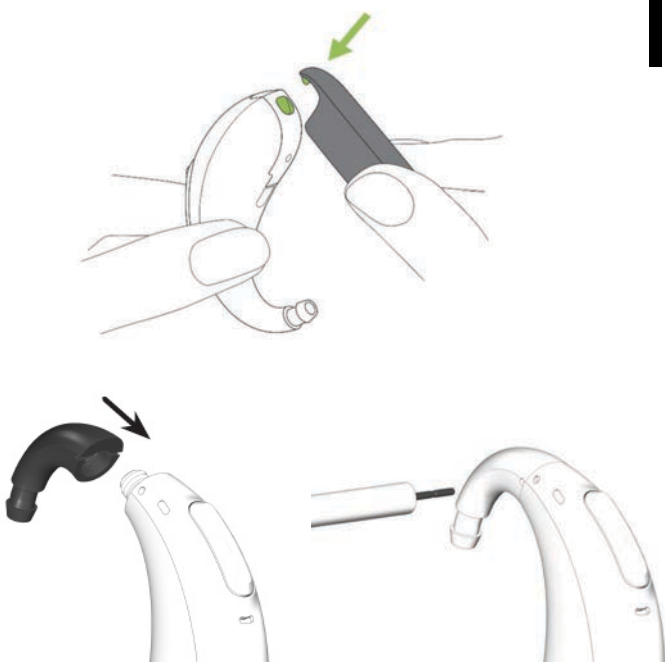


Graphite Gray



Sky Lumity: Protection

IP68



Sky Lumity PR and Charger Combi BTE 2



Designed to keep up with a child's lifestyle



6 hours

AutoSense Sky OS

10 hours

Roger or TV Connector
streaming



M = ~107 hrs*

UP = ~160 hours*

SP = ~143 hrs*

* M, SP & UP battery time dependent on brand of battery, degree of hearing loss and how the hearing aid is used, eg streaming time etc.

A Lumity solution for pediatrics



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Connectivity

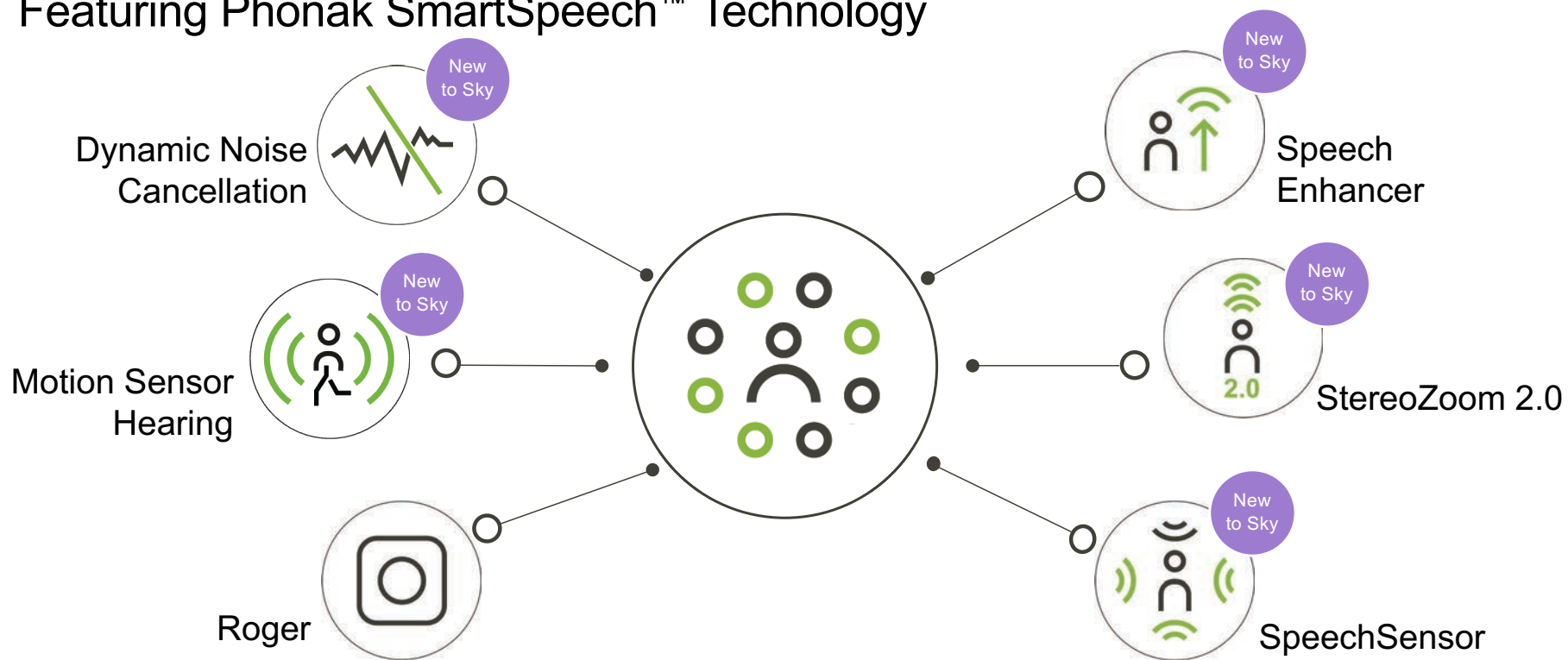


Speech understanding
with innovative technology



Designed for young users

AutoSense Sky OS 5.0 Featuring Phonak SmartSpeech™ Technology



Sky Lumity: Performance levels

Feature	90	70	50
StereoZoom 2.0 in ASOS	X		
StereoZoom 2.0 as manual program	X	X	
SpeechSensor	X		
Speech Enhancer	X		
Dynamic Noise Cancellation	X	X	
Motion Sensor Hearing (Sky L-PR)	X	X	X
Tap Control (Sky L-PR)	X	X	
HFP improvement	X	X	X
Windblock*	X	X	X
Roger and Directional	X	X	X

New

*Established features migrated to new levels for Sky

Impact of fatigue on children with hearing loss

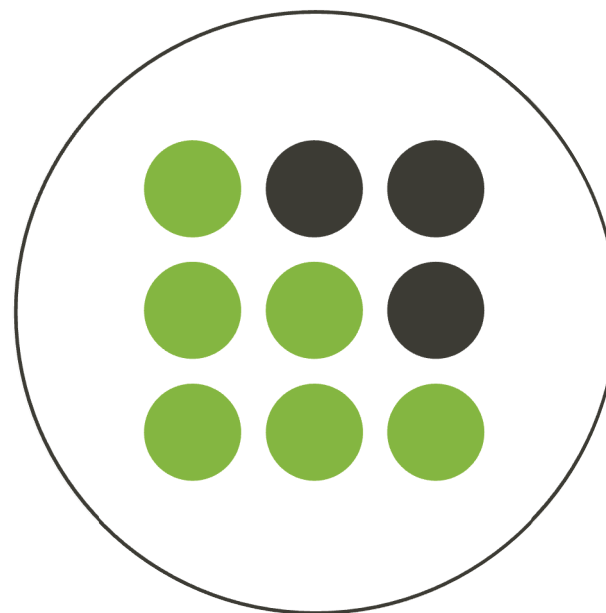
- Children with hearing loss **experience greater levels of fatigue** than children with normal hearing which is attributed to the **difficulties they experience in noisy environments**¹
- Almost **90%** of an elementary-age child's school day is spent **listening** to speech in noise²



1. Hornsby, B. W. Y., Gustafson, S. J., Lancaster, H., Cho, S. J., Camarata, S., & Bess, F. H. (2017). Subjective fatigue in children with hearing loss assessed using self- and parent-proxy report. *American Journal of Audiology*, 26(S), 393–407. |
2. Cruckley, J., Scollie, S., & Parsa, V. (2011). An exploration of nonquiet listening at school. *Journal of Educational Audiology*, 17, 23–35.

How AutoSense Sky OS helps

- **200+** unique setting combinations
- Scans the environment **700 times** per second
- More than **20 years of innovation** in machine learning using real-world sound recordings of children's environments
- AutoSense Sky OS 5.0 provides **greater listening comfort** by accurately classifying both speech and noise to provide the right level of noise reduction



Speech Enhancer

- Adaptive feature that is designed to enhance the peaks of speech in quiet situations
- More gain for speech in quiet while maintaining listening comfort and natural sound quality.
- Less listening effort



Speech Enhancer for kids



Children with hearing loss may have **difficulty understanding very low-level speech**¹



Access to speech has been shown to **influence language outcomes** in children with hearing loss¹



Activating Speech Enhancer provides children with an **additional 15% understanding of soft speech**²

¹ Wolfe, J., Duke, M., Miller, S., Schafer, E., Jones, C., Rakita, L., Dunn, A., Battles, J., Neumann, S., & Manning, J. (2022). Low-Level Speech Recognition of Children with Hearing Aids. *Journal of the American Academy of Audiology*, 33(4), 196–205. <https://doi.org/10.1055/a-1692-9670> |

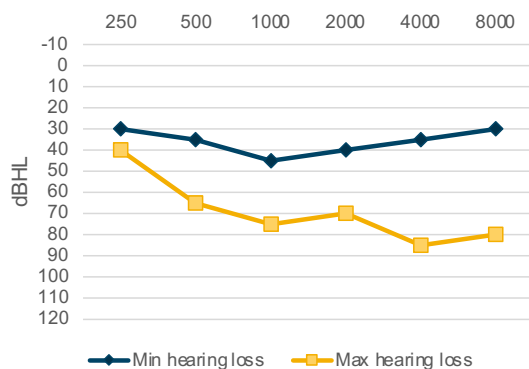
² Manning, J., Wolfe, J., Neumann, S., Nelson, J., & Dunn, A. (2022). The Use of Speech Enhancer with Pediatric Hearing Aid Users, [Conference Poster], 7th Phonak European Conference, Berlin, May 11 - 13 2023, retrieved from www.phonak.com/evidence.

Speech Enhancer benefit study

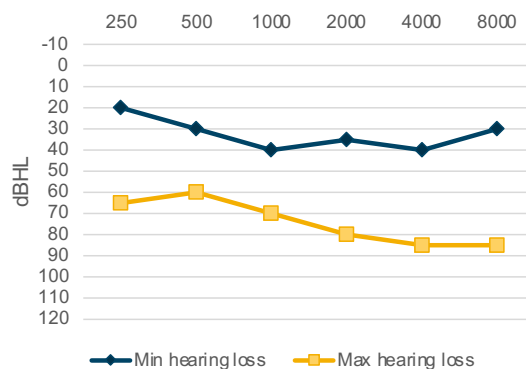
2022: Speech Enhancer study. Hearts for Hearing, Oklahoma USA

33 participants | Two groups

Range of hearing loss | 5 – 8 years olds
(13 participants)



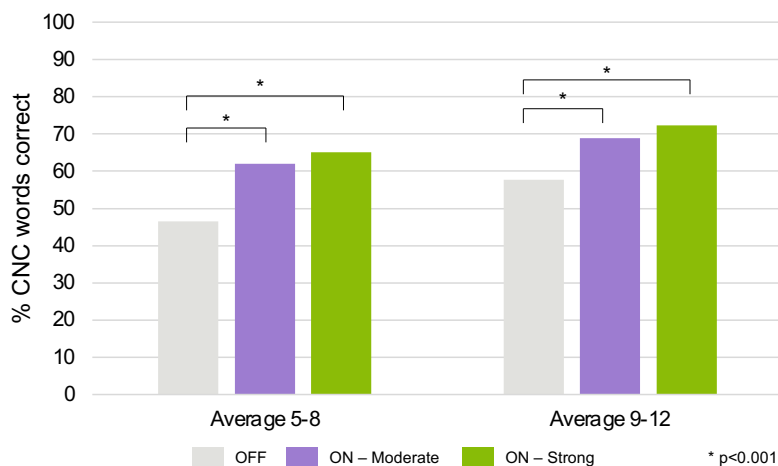
Range of hearing loss | 9 – 12 years olds
(20 participants)



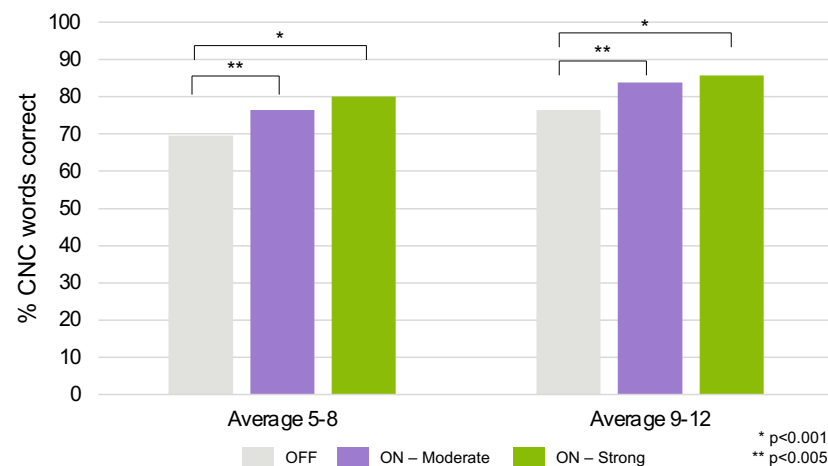
- **Hearing aids:** Either Naida P90-PR or Audéo P90-R
- **Speech stimulus:** Consonant Nucleus Consonant (CNC) words
- **Presentation level:** 40dB and 50dB
- **Conditions:** Speech Enhancer:
 - Off
 - On – Moderate
 - On – Strong

Benefit of Speech Enhancer for kids

**Speech Enhancer Off vs Moderate vs Strong
40dBA speech**



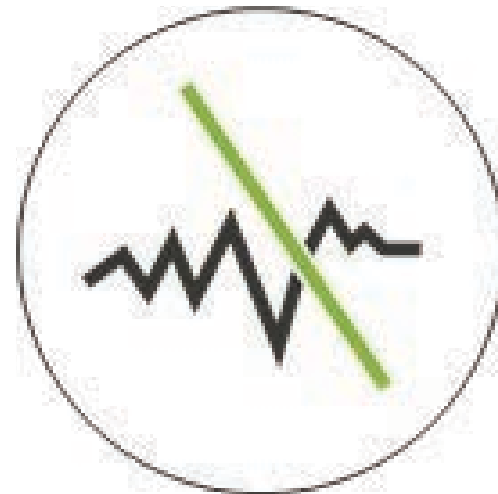
**Speech Enhancer Off vs Moderate vs Strong
50dBA speech**



Activating Speech Enhancer helps children understand more soft speech

Dynamic Noise Cancellation

- Spatial noise canceller that works in combination with a directional beamformer to improve the SNR in noise up to 4 dB.
- Reduces noise from the back and sides
- Reduces listening effort
- Personalized in the myPhonak app



Do children with hearing loss need noise reduction?

- Children with hearing loss **experience greater levels of fatigue** than children with normal hearing which is attributed to the **difficulties they experience in noisy environments**¹
- Almost **90%** of an elementary-age child's school day is spent **listening** to speech in noise²
- Children with hearing loss need **more favorable SNRs** for equivalent speech recognition performance compared to their normal hearing peers³



1. Hornsby, B. W. Y., Gustafson, S. J., Lancaster, H., Cho, S. J., Camarata, S., & Bess, F. H. (2017). Subjective fatigue in children with hearing loss assessed using self- and parent-proxy report. *American Journal of Audiology*, 26(S), 393–407.
2. Cruckley, J., Scollie, S., & Parsa, V. (2011). An exploration of nonquiet listening at school. *Journal of Educational Audiology*, 17, 23-35.
3. Crandell & Smaldino (2000). Classroom acoustics for children with normal hearing and with hearing impairment. *Language Speech Hearing Services in Schools*, 31(4): 362-370.

Dynamic Noise Cancelation (DNC) for kids with mild–severe hearing loss

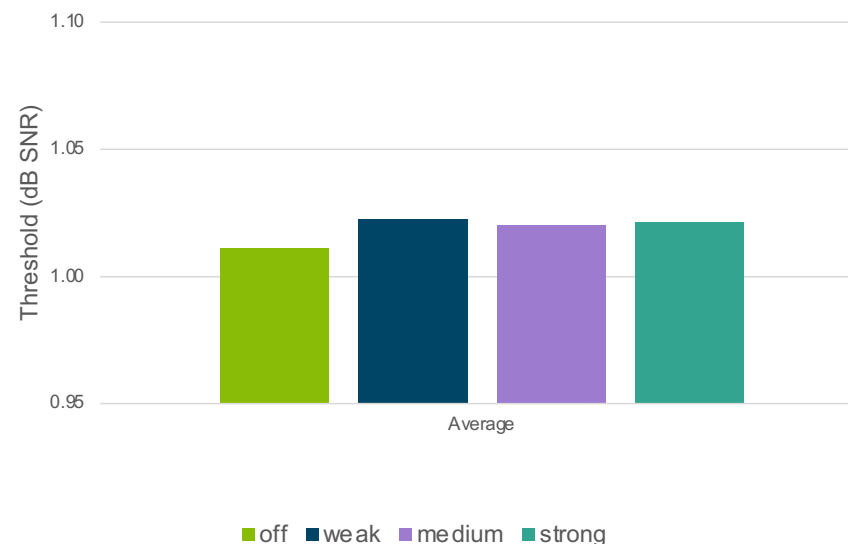
Objectives:

- Effect of speech intelligibility of DNC setting

Method:

- Determined SRT for Off, Weak, Medium and Strong DNC setting
- Noise at 68dBA and speech at variable levels
- SRT measured with HINT-C (Noise stable at 68 dBA and adaptive speech level)

Comparison of HINT-C with different DNC states
Speech 65 dBA, Noise 68 dBA



But what about younger kids?



- Bayesian regression model on the SRT50 data
- Based on DNC Weak
 - Potential default setting
 - No access to an app to adjust the setting
- *“low probability that younger children would perform worse than older children and there is a low probability that the “weak” DNC setting would affect speech recognition performance”*

Speech intelligibility is maintained with Dynamic Noise Cancellation on Weak for young children with mild - severe hearing loss

Pletcher, K., Kruse, R., Branscome, K., Nelson, J., & Picou, E. (2024, April 17-20) Noise control algorithm reduces listening effort for adolescents who are bilateral hearing aid users. [Conference Poster], American Academy of Audiology Annual Conference, Atlanta, Georgia, USA. <https://www.phonak.com/evidence>. Poster in preparation

 Dynamic Noise Cancellation will be on by default for children of all ages with Target 10.0



Motion Sensor Hearing

- Automatically steers the beamformer when walking in noise
- Reduces listening effort
- Patient preference for localization, sound quality



StereoZoom 2.0

- For focus on speech coming from the front
- 2.5 dB better SNR than StereoZoom 1.0
- 16% better speech understanding (compared to fixed directional)
- Decreased listening effort



SpeechSensor

- Spatial speech detection algorithm, accurately detects the direction of the primary speech signal in noise.
- Improved SNR when speech is coming from the sides or back
- Reduced listening effort when speech is not in the front as compared to SZ2.0.



SmartSpeech Technology defaults for pediatrics



Features	Default
 Speech Enhancer	Moderate*
 Dynamic Noise Cancellation	Off**
 Motion Sensor Hearing	Wide
 StereoZoom 2.0	Age-dependent feature

* Based on Speech Enhancer study

** Dynamic Noise Cancellation study results pending

Compatibility with Roger™



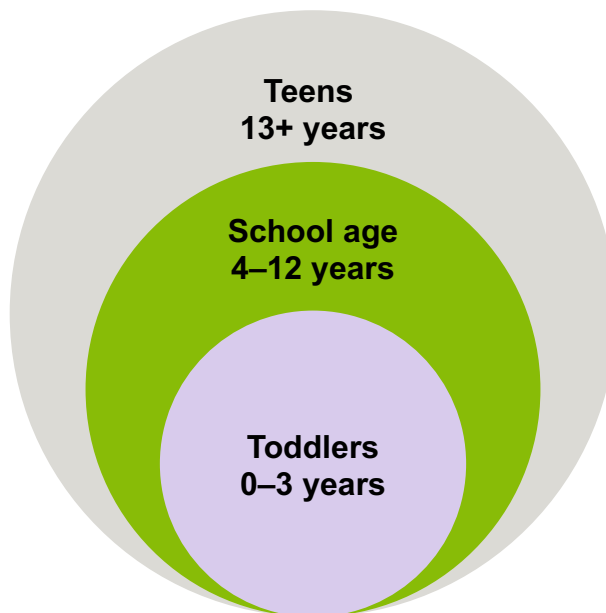
For home



Roger Clip-On Mic



Roger On™



For education



Touchscreen Mic



Pass-around



Multimedia Hub



SoundField

Benefits of Roger with kids

At least
32%

better speech understanding
compared to hearing aids alone¹

5,300
more words per day²

12%
more child-directed speech³

Kids appear to be
**Alert, Engaged
& Attentive⁴**

Better
receptive discourse skills⁵

Significantly better access to both quantity and quality of language

1. Wolfe, et al., (2021), 2. Benitez-Barrera, et al., (2018), 3. Bacic & Tharpe (2019), 4. Thompson, et al., (2020), 5. Curran et al., (2019).

Greater flexibility with Trial devices to support each family's needs

1

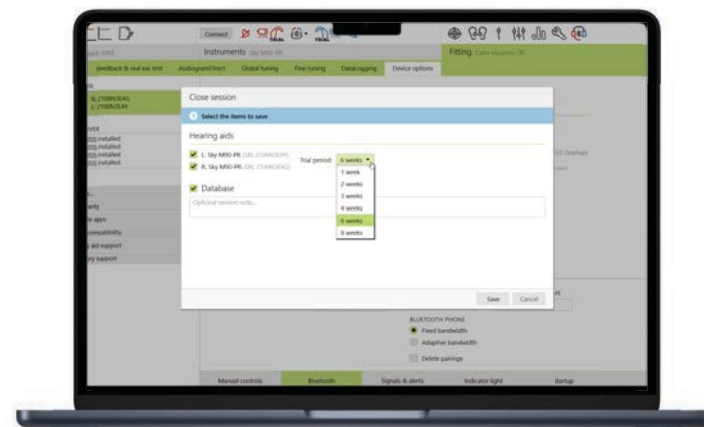
All Trial devices come with permanent Roger licenses installed

roger



2

Ability to choose length of trial period within the fitting session



A Lumity solution for pediatrics



50 years of commitment to
pediatric solutions



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with innovative technology



Connectivity



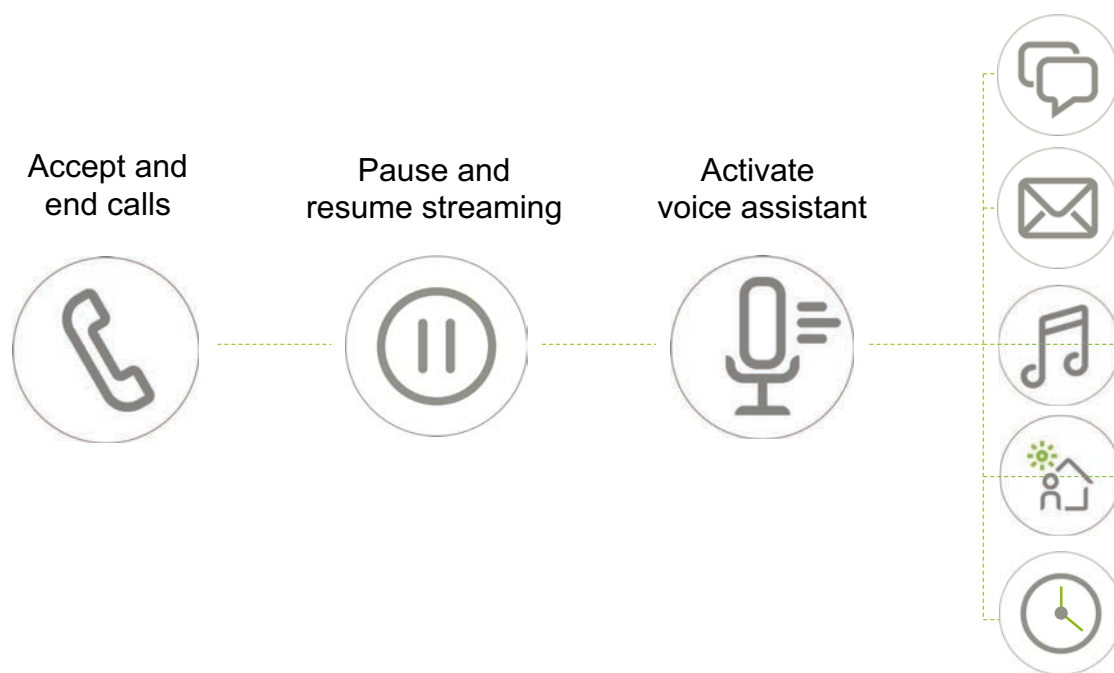
Designed for young users





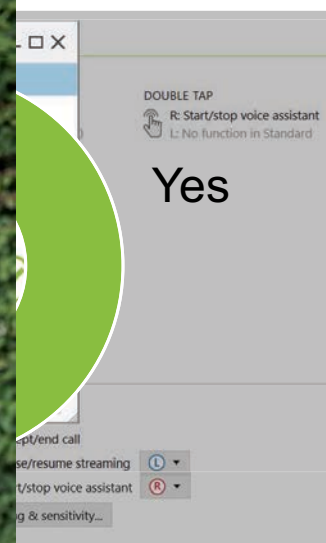
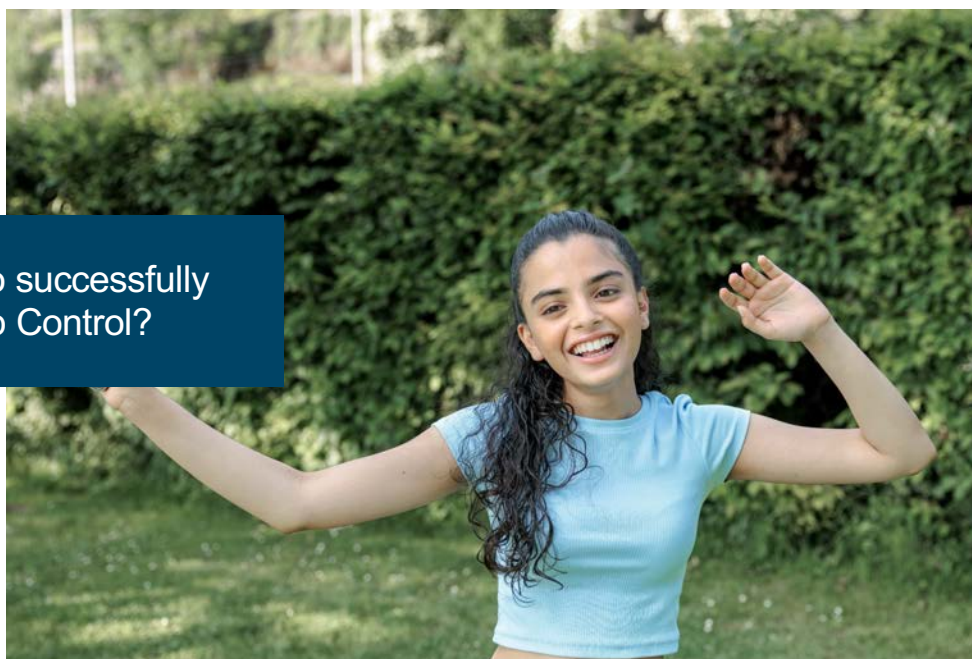
Tap Control

Tap Control



Should we consider Tap Control for kids?

Are kids able to successfully
activate Tap Control?



Can kids use Tap Control?



Successfully used
'double tap' during
training

67% on first attempt
100% after one
reinstruction



Successfully used
Pause/Resume with a
double tap

83% on first attempt
100% after one
reinstruction



Successfully answered
a phone call with a
double tap

83% on first attempt
100% after one
reinstruction

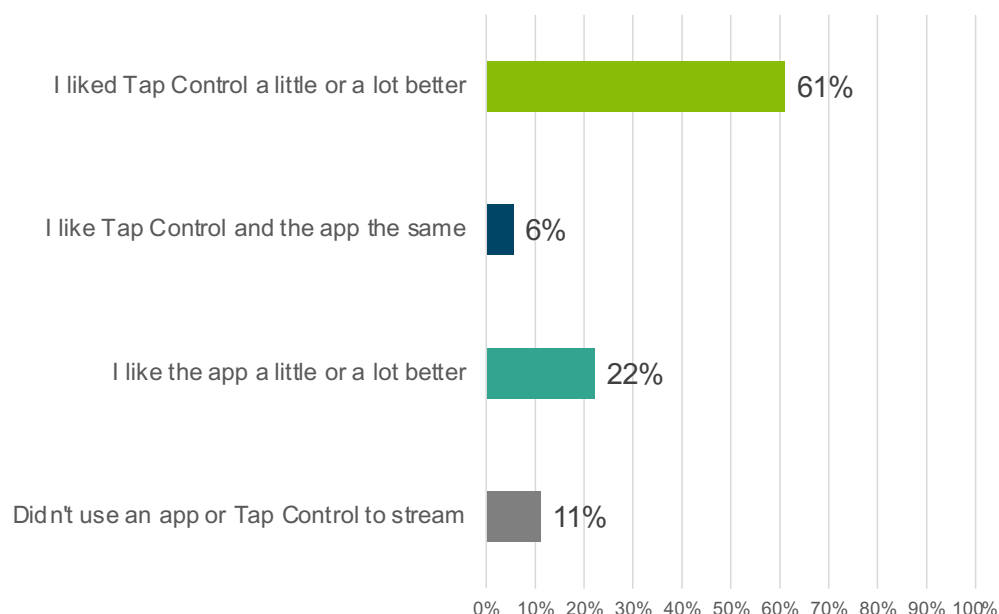


Successfully activated
the voice assistant with
a double tap

78% on first attempt
100% after one
reinstruction

Does Tap Control appeal to tweens and teens?

How do you prefer to control streaming?



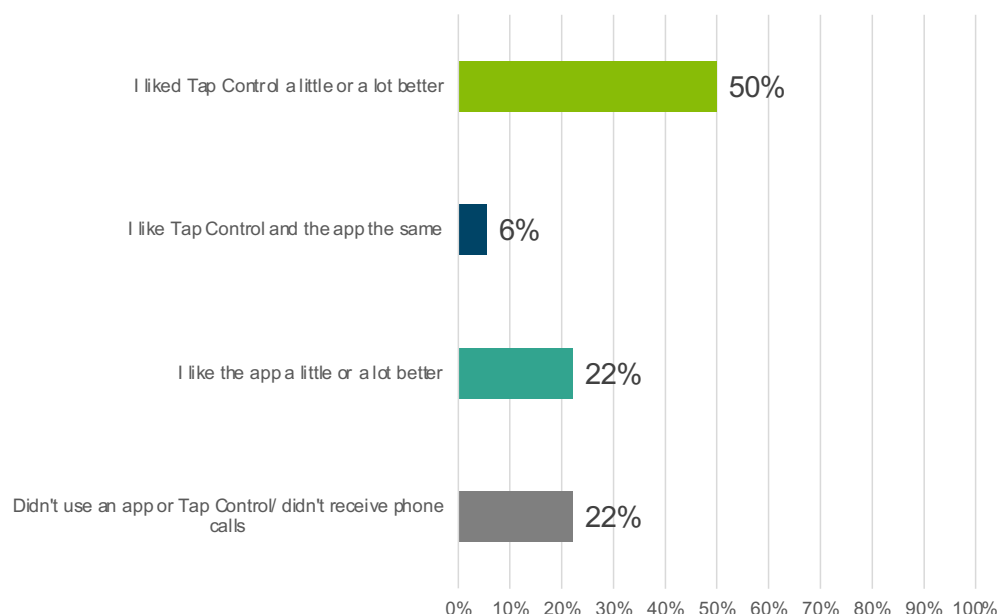
Instead of having to re-enter my cell phone in order to access the app, all I had to do was double tap. This makes it very convenient and I like that aspect about them.

It's faster than taking out my phone and pressing pause.

It seemed a lot more simple

Does Tap Control appeal to tweens and teens?

How do you prefer to answer phone calls?



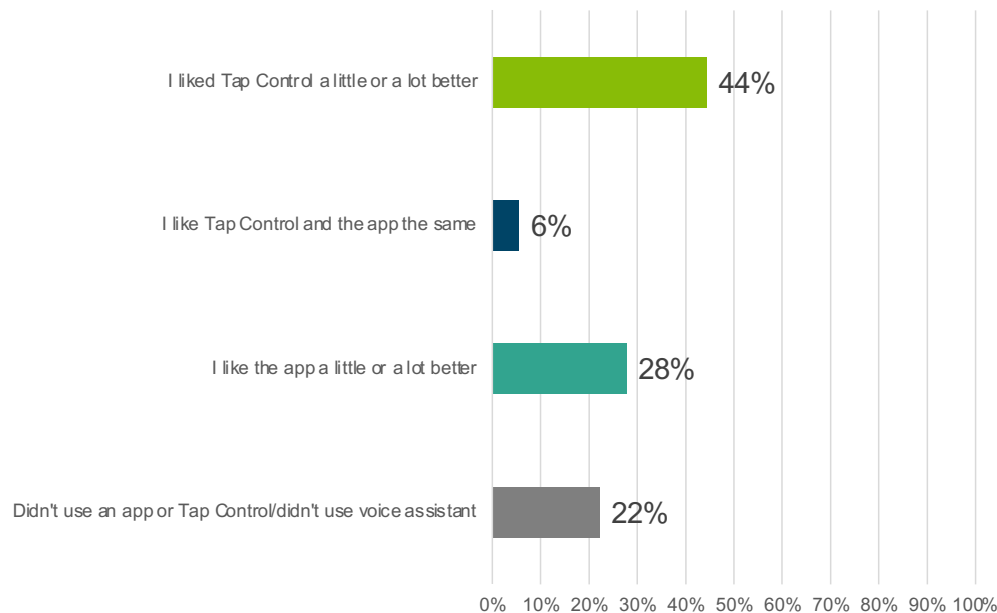
"It was so much nicer being able to not stop what I was working on and being able to just answer a call remotely."

"so that i could get on the call right away and not have to go to the app it would just let me connect quicker"

"I take out my phone to see who is calling me so I would rarely tap to answer."

Does Tap Control appeal to tweens and teens?

How do you prefer to use voice assistant?



"sometimes I will accidentally call Siri with tap control."

"I didn't use the MyPhonak app in order to summon siri but i did just use the dedicated device button to summon Siri over the touch control as it wasn't as easy to use."

"Since all I have to do to activate Siri on my phone is say "Hey Siri" its a little easier I guess."

Will the default Tap Control setting for kids change?



Connectivity for all



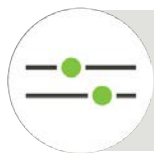
Peace of mind and personalization with myPhonak Junior



Sound environment data

Provides peace of mind for parents

NEW



Fitting flexibility

Connects dissimilar form factors (eg. M & SP)



Remote Support

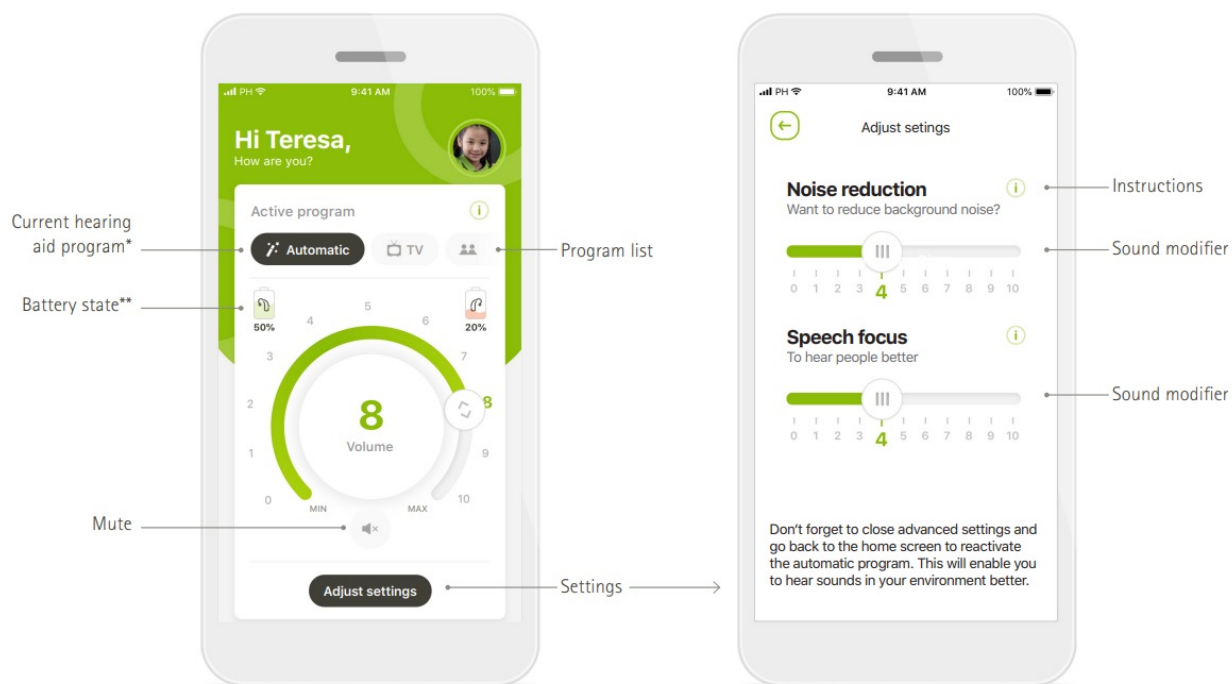
For convenience and empowerment



myPhonak Junior is the winner of the Hearing Technology Innovator 2023 award in the Mobile Apps for Hearing Devices category



Quick overview



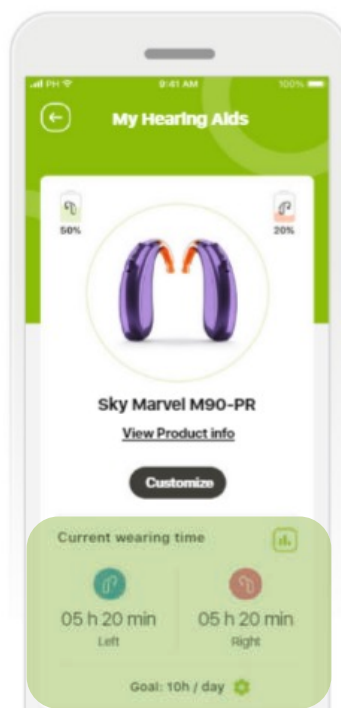
Remote Control

Adjust settings

* AutoSense™ Sky OS for Sky hearing aids. AutoSense™ OS for Bolero, Naida and Audéo hearing aids.

**Only available for rechargeable hearing aids

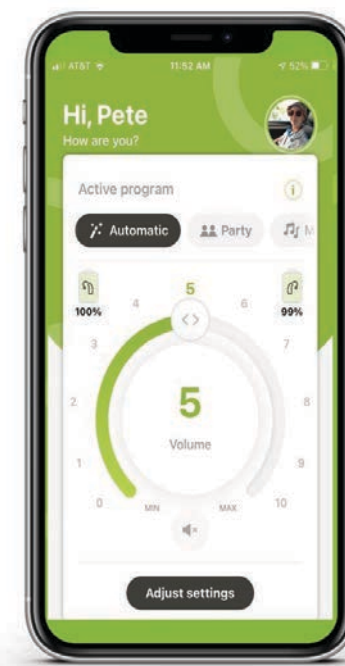
Quick overview – wearing time



myPhonak vs myPhonak Junior



Feature	myPhonak	myPhonak Junior
Volume	😊😊	😊😊
Split volume	😊😊	🚫
Program	😊😊	😊😊
Mute	😊😊	😊😊
Noise Reduction	😊😊	😊😊
Speech Focus	😊😊	😊😊
Remote Support	😊😊	😊😊
Battery status	😊😊	😊😊
Wear time (with sound environments)	😊😊	😊😊
Roger receiver status	😊😊	😊😊
Health tracking	😊😊	🚫
Choice of pediatric or adult theme	🚫	😊😊
Extensive FAQs	🚫	😊😊
Dynamic slider	😊😊	🚫
Frequency band adjustment	😊😊	🚫
Custom program creation	😊😊	🚫



A Lumity solution for pediatrics



50 years of commitment to pediatric solutions



Speech understanding with innovative technology



Connectivity



Designed for young users



Sky Lumity: Pediatric design

- AutoSense Sky OS 5.0
- StereoZoom 2.0
- Speech Enhancer
- SpeechSensor
- Dynamic Noise Cancellation
- Motion Sensor Hearing*
- RogerDirect™

- CROS L-R compatible*
- Tap Control*



- Universal Bluetooth® connectivity
- myPhonak Junior app
- Wearing time and Remote Support

- Robust and reliable housing
- Stylish color range
- Tamper-proofing options
- LED Visual Indicator
- Pediatric workflow

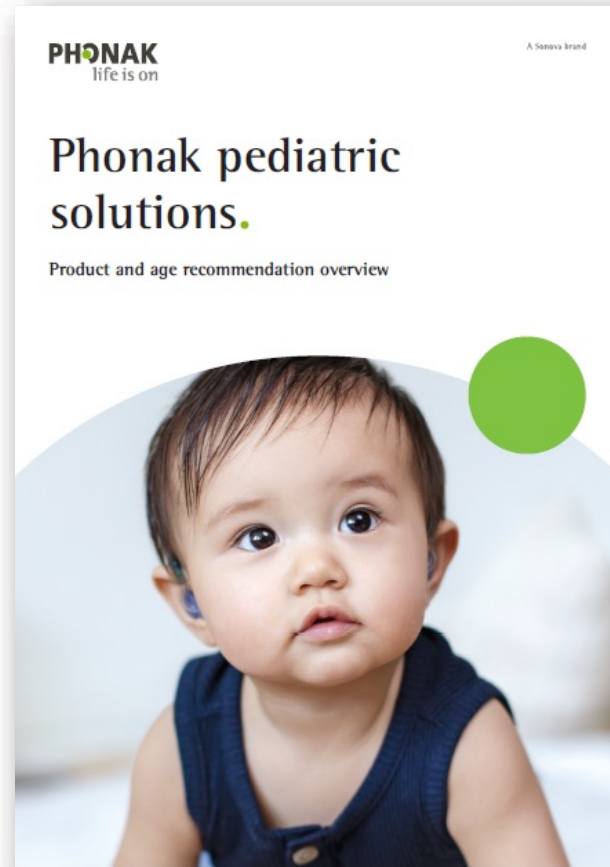
*Sky L-PR only



A solution for all

Age consideration guidelines

- Considerations for:
 - Sky
 - Audéo
 - CROS
- Roger microphone information
- Benefits of myPhonak Junior app



With Phonak, life is On





Together,
we change lives .