



# Phonak solutions for pediatric unilateral hearing loss

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# What is unilateral hearing loss (UHL) and why do we need to act?

UHL is a condition where a child has normal hearing in one ear and a hearing loss in the other. This hearing loss can range from mild to profound. The hearing loss may be aidable but not in all cases. This has major implications for choosing the right hearing solution.

It is essential that UHL is identified and intervention provided as early as possible to help manage potential adverse outcomes, including developmental, academic and psychosocial problems. As a physician you can play an essential role in helping children with UHL and their parents understand the need for fitting a suitable device which is tailored to their needs and preferences, ensuring they are ready to succeed.

Phonak has a range of technologies developed specifically for children with unilateral hearing loss, to help ensure that they can engage with all that life has to offer.

# One ear is not sufficient: challenges of UHL

When a child has normal hearing in only one ear, they can experience a variety of difficulties.

## Working out the direction from which a sound comes

In this case, the child will have an increased reliance on visual cues. Localization of sound sources is important for safety, e.g. when crossing the road.

## Understanding what a person says unless they are in close physical proximity

Two normal hearing ears help us to filter out noise to better hear speech.

## Hearing and responding to a person when they speak on the side with hearing loss

Sounds are heard more softly when only heard in one ear and therefore more difficult to interpret.

## Hearing in noisy environments

Having one normal hearing ear is not enough to hear well in challenging listening situations, e.g. in classrooms, playgrounds, and during sports.

# Consequences of UHL

If a child cannot hear well, there can be serious implications for their developing speech, language and communications skills.

Unlike adults, children with UHL can lack strategies to adapt to their hearing loss. These potential problems are not just limited to spoken language. Not hearing well with both ears puts a child at risk of<sup>1, 2, 3</sup>

- speech and language delay
- general communication difficulties
- psycholinguistic dysfunction
- social and emotional problems
- child safety concerns

These can ultimately result in both academic and behavioral difficulties.<sup>2, 3, 4</sup>

**1 in 1000** newborn infants are identified with UHL.<sup>5</sup> **3 in 100** school-aged children have UHL, with diagnosis occurring on average between 3 and 5 years of age.<sup>1</sup>

Compared to children with normal, binaural hearing, those with UHL are<sup>1, 2, 3</sup>

- **10 times more** likely to need to repeat a year of school
- **5 times more** likely to need support services

Recent meta-analyses reveal additional problems experienced by children with UHL

- lower IQ scores<sup>6</sup>
- impaired quality of life<sup>7</sup>

"We found that there were differences not only in auditory networks which we would expect, but also in executive function regions, between the children with UHL and their normal hearing siblings"

*Judith E.C. Lieu, MD MSPH discussing findings from fcMRI study on children with UHL<sup>8</sup>*

# Taking action against UHL: getting ready for success

Early intervention is recommended by experts on UHL in children. And, hearing technologies should be considered as part of early intervention.

## Tailoring solutions to different needs

Due to the mixed and broad nature of UHL, solutions need to be tailored to the child and their circumstances, including age, family situation and communication goals.

## Partnering with parents is the gold standard of care to determine the best combination of

- amplification
- academic accommodations
- follow-up monitoring

## UHL expert recommendations<sup>9</sup>

- traditional hearing aids
- bone conduction aids
- CROS
- cochlear implants
- remote microphone systems

## Addressing noisy situations

Whatever the choice of solutions, special consideration needs to be given to noisy situations, e.g. the classroom, where a remote wireless technology is recommended for best performance. Roger™ is the single choice for these situations as a Roger system can be used together with other UHL solutions.

Children with unilateral hearing loss face a unique set of challenges, and require a comprehensive treatment approach. As a physician, you can ensure that the individual needs of children with UHL and their families are addressed.



# Phonak Sky™ Marvel



## Building strong relationships, one conversation at a time.

Phonak is committed to offering every child with hearing loss the best possible start in life. Enabling children to communicate more effectively allows them to establish important relationships from the very first moment. This is the foundation for building strong bonds with family, friends, in school and socially. Sky Marvel gives you the opportunity to help children with hearing loss build these bonds with easy-to-use, state-of-the-art technology.

Sky Marvel offers four key benefits to children with hearing loss



Clear, rich sound



Connects to smartphones,  
Roger™ mics and more



Rechargeable



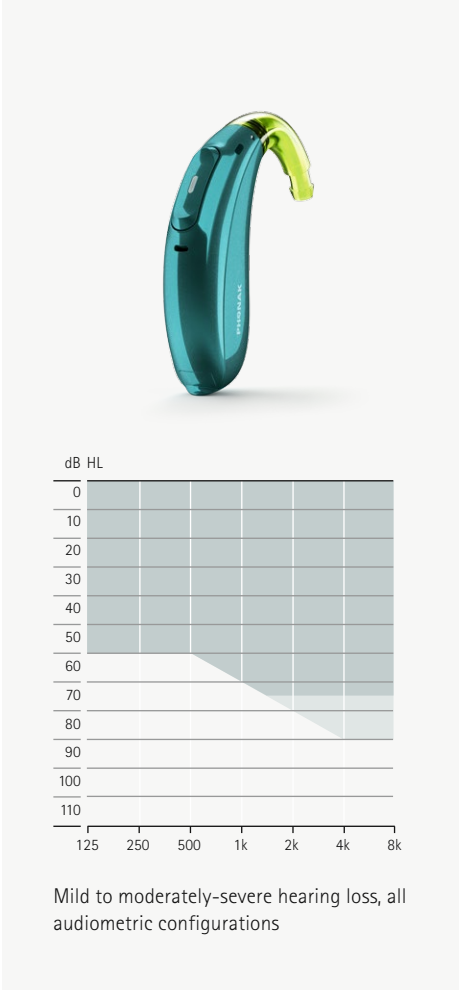
Child-specific design

With the new Sky Marvel portfolio, we introduce a unique combination of world's first technological innovations in hearing aids and essential child-specific features. We strive to give children only the best for speech and language development, speech intelligibility and ease of use. Developed to maximize both the quantity and quality of audible input, Sky Marvel supports a child's social, emotional and cognitive development with love from the very first sound.

The **Sky Marvel portfolio** comprises three stylish behind-the-ear (BTE) models, including a rechargeable version, offered in four performance levels (M90, M70, M50, M30). There is a Sky Marvel for every child regardless of age or degree of hearing loss.

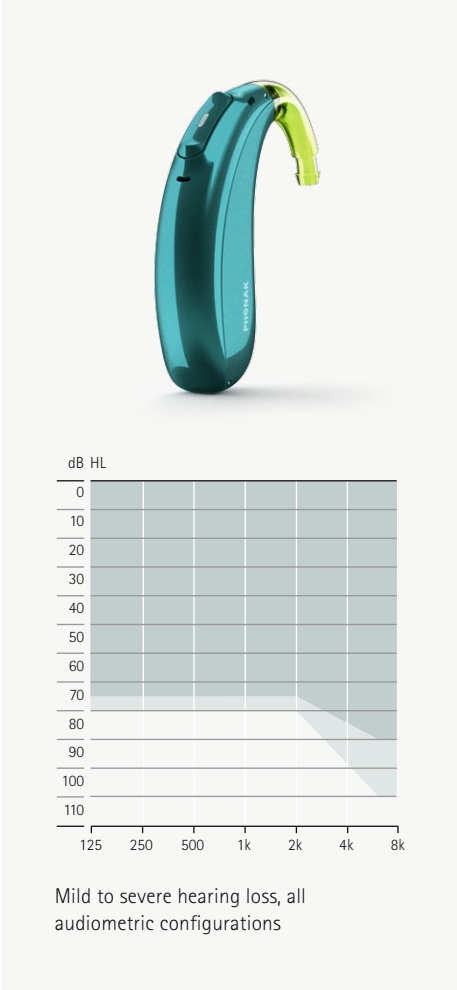
**Phonak Sky M-M**

M90/M70/M50/M30



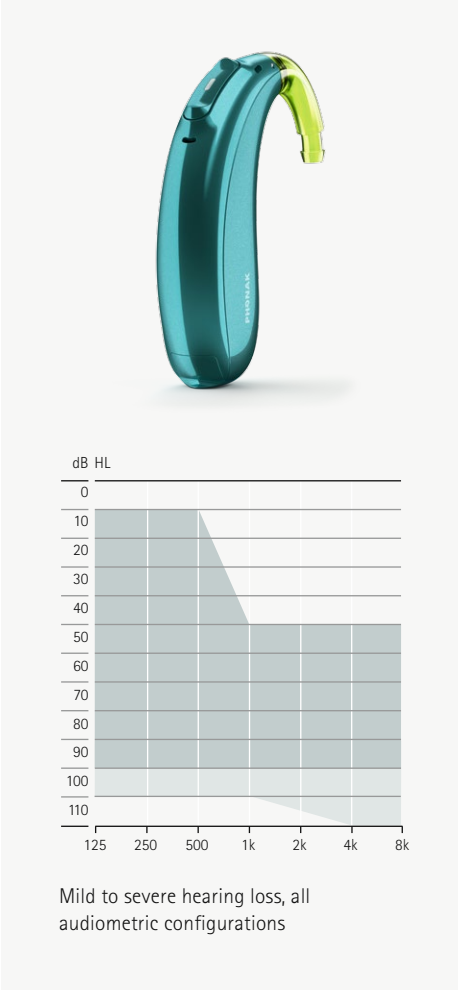
**Phonak Sky M-PR**

M90/M70/M50



**Phonak Sky M-SP\***

M90/M70/M50/M30



■ SlimTube HE ■ HE11 680 \* Available February 2020

# Sky Marvel and Roger

The world's first pediatric hearing aids that stream directly from Roger microphones

## **Roger for young children**

A recent study, conducted at Vanderbilt University, showed that with Roger use at home, preschool children had access to approximately 5,300 more words in an eight-hour day.<sup>10</sup> Children also had access to 12% more child-directed speech per day with remote microphone use, compared to using hearing aids alone.<sup>11</sup> Increasing the quantity of words a small child hears is vital; however, increasing access to quality interactions has an even greater impact on their development.<sup>12</sup>

Additionally, the Outcomes of Children with Hearing Loss (OCHL) study found that children who used a remote microphone system, like Roger, for home use had improved language outcomes compared to those who did not, and they scored significantly better on high-order language skills such as receptive discourse ability.<sup>13</sup>

With RogerDirect™, Roger receivers can be wirelessly installed into Sky Marvel hearing aids. As soon as a connected Roger microphone is switched on, children can take advantage of the proven performance of Roger in loud noise and over distance.<sup>14</sup> Roger technology in a small package ensures easier access to more words and more conversations, helping to build strong relationships and overcome the barriers of hearing loss.<sup>11, 15</sup>

## **Roger for school-age children and teens**

The benefits of Roger for school-age children and teens are well established, providing unparalleled performance with 54% improvement in speech understanding compared with other remote microphone technologies.<sup>16</sup> With RogerDirect, in both Sky Marvel and Audéo Marvel, older children and teens can now enjoy these proven benefits without the need to wear additional equipment.



# Roger portfolio

## Roger for the classroom



### Roger Touchscreen Mic

Roger Touchscreen Mic features a user-friendly interface for use in the classroom. With an automatic microphone function, it conveniently switches from an individual talker to a small group interaction mode, depending on its placement.



### Roger Pass-around Mic

Roger Pass-around Mic is designed to enhance classroom discussions so that not only teachers but all students are heard clearly. With an appealing design, the microphone is the optimal size for children and teens to hold and fully control.



### Roger Multimedia Hub

Roger Multimedia Hub allows a teacher's voice to be heard simultaneously with an audio signal. Used as a stand-alone device, it can be connected to an audiobook or tablet for individual listening.

## Roger for home and social situations



### Roger Select™

Roger Select uses MultiBeam Technology and gives older children and teens discreet control in large, noisy conversations. When placed on a table, it can automatically detect who is talking. The user can also manually select, with a tap of the microphone, who they want to listen to when multiple conversations are happening at the same time.



### Roger Pen™

Roger Pen offers a unique design and features fully automated or manual microphone settings and Bluetooth connectivity, providing an all-inclusive listening experience.



### Roger Clip-On Mic

The Roger Clip-On Mic is a small and lightweight microphone worn on a shirt. Perfect for parents and family members, multiple Roger Clip-On Mics can be used together, allowing a child to hear everyone.

## Roger receivers



### Roger X

Roger X is the miniature universal Roger receiver which is compatible with all Roger microphones and can now be wirelessly installed into any Sky Marvel hearing aid.



### Roger MyLink

Roger MyLink is an easy-to-use universal Roger receiver worn around the neck and compatible with Sky M-M and Sky M-SP.

# Phonak CROS B: when there is no usable hearing on the impaired side

Some children may have no usable hearing on the impaired side. This is often referred to as single-sided deafness (SSD), a subgroup of UHL, and in these cases a hearing aid alone cannot provide benefit.



CROS B-13 with CROS Hook\*



CROS B-13 with SlimTube



CROS B-312 with SlimTube



CROS B-312 with CROS Tip

For children with an unaidable hearing loss on one side and normal hearing in the other ear, Phonak now offers a discreet CROS transmitter (Contralateral Routing of Signal). Featuring the unique Phonak Binaural VoiceStream Technology™ (BVST), CROS B wirelessly transmits sound from the unaidable ear to the Sky B hearing aid on the better hearing ear.

When competing noise is presented from the side, our CROS B system is designed to provide front facing speech with an 18 dB advantage. The benefit of separating speech and noise helps children to focus on the person talking in front of them.

The Phonak CROS B portfolio consists of cosmetically attractive wireless transmitters that are suitable for children with SSD.

- Cable free – 100% wireless audio transmission
- Non-invasive – no surgery needed
- Flexible – range of styles, retention options and attractive colors
- Convenient – quick and easy fitting

\* This solution also meets the IEC standards for use around small children when used with the optional tamperproof battery door. Only available on the CROS B-13 model.

# Phonak CROS B and Phonak Sky B: a powerful combination

When there is no usable hearing on the impaired side, it is important to provide a solution that can help children detect sound sources, understand people when they talk on the side with hearing loss and hear speech in noise.



**Binaural VoiceStream Technology™ (BVST):** CROS B and Sky B use the latest in BVST to stream sound from the impaired side to the normal-hearing ear.



**Automatic activation of the Roger program when using CROS B and Sky B with a Roger receiver.**

In high noise situations, like a classroom, Roger wireless technology is used to improve the signal-to-noise ratio for better speech understanding.

# Focus on performance

Roger Focus is a discreet behind-the-ear receiver that cuts through distracting background noise by bringing a speaker's words directly into a child's ear(s). This lightweight, discreet and durable receiver is the perfect companion for active kids, offering protection from water and dust.

## Product highlights

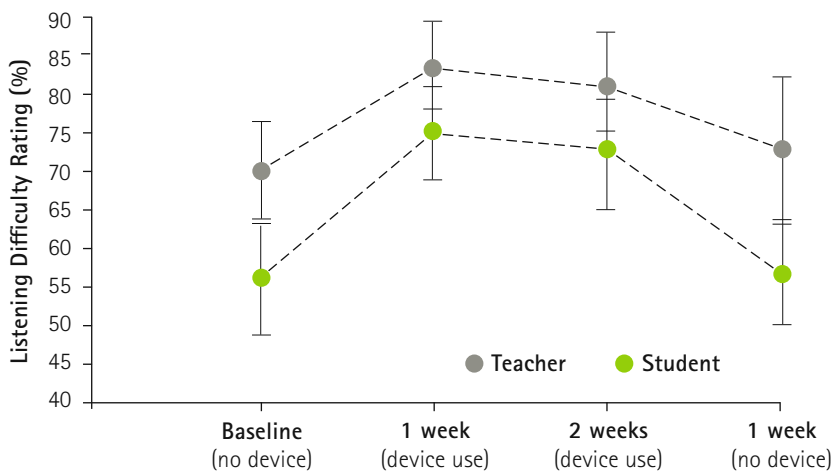
- Usable out of the box (no programming)
- One-click microphone connection
- Volume control
- Water and dust resistant (IP57\*)
- 17 color options
- Customizable with 4 SlimTubes and 3 sizes of open domes



Roger wireless technology offers children unprecedented access to sound in a simple, easy-to-use digital solution. By reducing the adverse impact of background noise, children with UHL can experience improved listening ability.<sup>17</sup>

### Maximum performance

Results from a recent study show that school-aged children with UHL who were fitted with a Roger Focus device demonstrated observable and perceptual benefits.<sup>17</sup> For example, Figure 1 shows that both students and teachers reported classroom listening and comprehension were improved while wearing a Roger Focus device fit to the normally hearing ear<sup>5</sup>.



**Figure 1:** Student and teacher listening/comprehension difficulty ratings using the LIFE-R questionnaire across unaided and aided time period. A Roger Focus device was fit to the normally hearing ear.

### Zero hassle

Roger Focus requires no pre-programming or adjustment. Simply connect the Roger microphone. With Roger Focus, listening is easier than ever.

### Full compatibility

Roger Focus is easy to use alongside other classroom technologies because it has been designed to avoid interference with any systems running on 2.4 GHz. It is also fully compatible with the Roger Touchscreen Mic, meaning a teacher can use this microphone to transmit speech simultaneously to all Roger and soundfield listeners.

### Wearable comfort

Even the best hearing technology is useless if a child does not wear it. Roger Focus has been designed to be lightweight, unobtrusive, and comfortable. Plus, it can be easily customized to suit the specific needs and preferences of every young listener.

# Summary

UHL is a condition where a child has normal hearing in one ear and a mild to profound hearing loss in the other.

Even a mild impairment can disrupt the listening process and result in developmental, academic and psychosocial difficulties.

Experts agree that early intervention is imperative.

There are many considerations in choosing the right hearing technology or multiple technologies for any child with UHL as they grow. Phonak offers a comprehensive and easy-to-use portfolio of hearing solutions to meet the unique needs of every child with UHL and to help them succeed.

The *Consensus practice parameter: audiological assessment and management of unilateral hearing loss in children*<sup>18</sup> is a peer-reviewed consensus document written by an international panel of experts that provides recommendations for the management of children with UHL.  
[www.phonakpro.com/uhl](http://www.phonakpro.com/uhl)



# References

- 1 Bess, F.H., Dodd-Murphy, J. & Parker, R.A. (1998). Children with minimal sensorineural hearing loss: Prevalence, educational performance, and functional status. *Ear & Hearing*, 9, 339–354.
- 2 Bess, F.H., Tharpe, A.M. (1984). Unilateral hearing impairment in children. *Pediatrics*. 74 (2). 206–216.
- 3 Bovo, R., Martini, A., & Agnoletto, M. (1988). Auditory and academic performance of children with unilateral hearing loss. *Scand Audiol Suppl*. 30. 71–74.
- 4 Oyler, R.F., Oyler, A.L., Matkin, N.D. (1988). Unilateral hearing loss: demographics and educational impact. *Language, Speech, and Hearing Services in Schools*. 19, 201–210.
- 5 Prieve, B., Dalzell, L., Berg, A., Bradley, M., Cacace, A., Campbell, D. et al. (2000). The New York State universal newborn hearing screening demonstration project: Outpatient outcome measures. *Ear & Hearing*. 21 (2), 104–117.
- 6 Purcell, P.L., Shinn, J., Davis, G., & Sie, K. (2016). Children with unilateral hearing loss may have lower intelligence quotient scores: A meta-analysis. *Laryngoscope*. 126 (3). 746–754.
- 7 Roland, L., Fischer C., Tran, K., Rachakonda, T., Kallogjeri D & Lieu, J.E. (2016). Quality of life in children with hearing impairment: Systematic review and meta-analysis. *Otolaryngol Head Neck Surg*. 155 (2). 208–219.
- 8 Lieu, J. (2017). "Consequences of UHL on language and school performance" presented at the Unilateral Hearing Loss in Children Conference 2017 in Philadelphia. Retrieved from <https://www.phonakpro.com/com/en/training-events/events/past-events/2017/uhl-in-children-conference-philadelphia.html>, accessed January 20th, 2020.
- 9 Bagatto, M. (2018). Quick Practice Guidelines: Tools and considerations for assessing and managing unilateral hearing loss in children. Phonak AG. Retrieved from [https://www.phonakpro.com/content/dam/phonakpro/gc\\_hq/en/resources/evidence/white\\_paper/documents/technical\\_paper/quick\\_practice\\_guideline\\_btb\\_uhl.pdf](https://www.phonakpro.com/content/dam/phonakpro/gc_hq/en/resources/evidence/white_paper/documents/technical_paper/quick_practice_guideline_btb_uhl.pdf), accessed January 20th, 2020.
- 10 Benítez-Barrera, C.R., Angley G., & Tharpe, A.M. (2018). Remote microphone system use at home: Impact on caregiver talk. *Journal of Speech, Language and Hearing Research*, Vol. 61, 399–409.
- 11 Benítez-Barrera, C., Thompson, E., Angley, G., Woynaroski, T., & Tharpe, A. M. (2019). Remote microphone use at home: Impact on child-directed speech. *Journal of Speech, Language, and Hearing Research*, 62(6).
- 12 Trafton, A. (2018). Back-and-forth exchanges boost children's brain response to language. *MIT News*. Retrieved from: <http://news.mit.edu/2018/conversation-boost-childrens-brain-response-language-0214>, accessed January 20th, 2020.
- 13 Curran, M., Walker, E., Roush, P., & Spratford, M. (2019). Using propensity score matching to address clinical questions: The impact of remote microphone systems on language outcomes in children who are hard of hearing. *Journal of Speech, Language, and Hearing Research*, 62 (3), 564–576.
- 14 Thibodeau, L. (2014). Comparison of speech recognition with adaptive digital and FM wireless technology by listeners who use hearing aids. *American Journal of Audiology*, 23, 201–210.
- 15 National Scientific Council on the Developing Child. (2004). Brain architecture. Retrieved from <https://developingchild.harvard.edu/science/key-concepts/brain-architecture/>, accessed January 20th, 2020.
- 16 Thibodeau, L. (2014). Comparison of speech recognition with adaptive digital and FM wireless technology by listeners who use hearing aids. *American Journal of Audiology*, 23(2), 201–210.
- 17 Rance, G. (2018). Remote microphone listening devices for children and adults with unilateral hearing loss. *Phonak Field Study News*. retrieved from [www.phonakpro.com/evidence](http://www.phonakpro.com/evidence). Accessed January 20th, 2020.
- 18 Bagatto, M., DesGeorges, J., King, A., Kitterick, P., Lurnagaray, D., Lewis, D., Roush, P., Sladen, D. P., & Tharpe, A. M. (2019). Consensus practice parameter: audiological assessment and management of unilateral hearing loss in children. *International Journal of Audiology*, retrieved from <https://www.tandfonline.com/doi/full/10.1080/14992027.2019.1654620>, accessed January 20th, 2020.

# Life is on

At Phonak, we believe that hearing well is essential to living life to the fullest. For more than 70 years, we have remained true to our mission by developing pioneering hearing solutions that change people's lives to thrive socially and emotionally. Life is on.

[www.phonakpro.com/UHL](http://www.phonakpro.com/UHL)