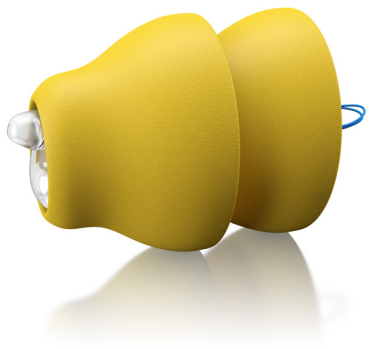
Field Study News

October 2015

Lyric™



In support of Lyric3

Study shows good speech clarity, natural sound & acceptance

The purpose of the Lyric3 beta validation study was to evaluate the improved performance of the Lyric3 device among new and experienced Lyric users. Over a period of 6-8 weeks, the hearing aid fittings, follow-up, and all data collection were conducted by current Lyric providers in a clinical setting. The results, both quantitative and anecdotal, show good outcomes for speech clarity, sound quality, and overall acceptance. This leads to the conclusion that the optimized Lyric3 can be successfully used by new users, current Lyric3 users, and current Lyric2 users.

Introduction

Hearing technologies are constantly and rapidly evolving, with each generation bringing new features and added benefits. Lyric is no exception.

Lyric is a unique hearing solution that created a new, extended-wear hearing device category when it launched to the public in 2007. "Extended-wear" means that the device is worn 24 hours a day, 7 days a week for months at a time. Lyric provides amplification for individuals with mild to moderately-severe hearing loss. The device is inserted deeply into the ear canal using a non-surgical procedure and without anesthesia. The placement of Lyric in the ear canal is intended to make the device invisible, to require less gain, and to take advantage of the natural acoustic cues provided by the lateral portions of the external ear. Since 2007, Lyric technology has undergone many major and minor product improvements — in power consumption, size, form factor, signal processing, etc.

The latest improvement to Lyric3 were released in 2015 and features two main enhancements — increased headroom with the addition of a "Maximum" Output Compression Control (OCC) setting, and a less sensitive Giant MagnetoResistive (GMR) switch. These improvements are designed to yield benefits in speech understanding, sound quality, and more reliable phone use.

The purpose of this study was to investigate patient outcomes related to the increased headroom in Lyric3. Specifically, we set out to evaluate speech clarity, naturalness of sound, and overall acceptance of Lyric3 by three groups of individuals: new Lyric3 users, current Lyric3 users transitioning to the improved Lyric3 device, and current Lyric2 users transitioning to Lyric3.

PHONAK
life is on

Methods

The Lyric3 beta validation study involved 9 clinicians at 6 independent audiology practices around the United States. Forty-seven adults, aged 24 to 88 years (mean = 66 years), participated in the study. Approximately 47% of the study participants were female.

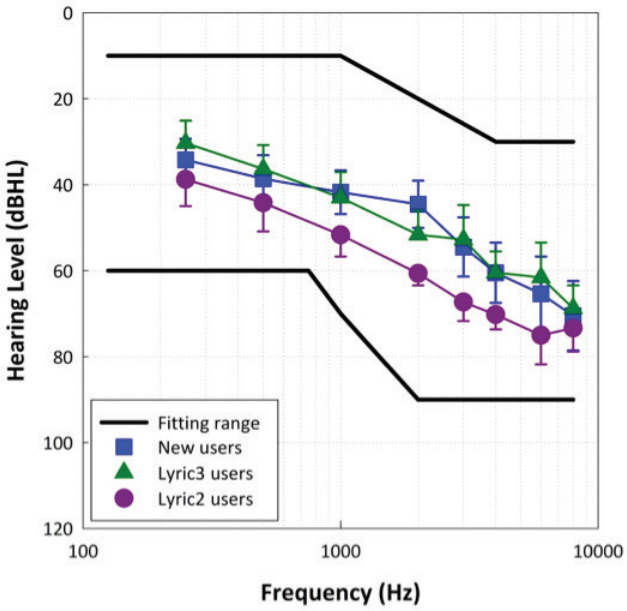


Figure 1. Mean (symbols) 95% confidence interval 9 error bars) for audiometric thresholds for study participants. Black lines represent upper and lower limits of the published fitting range for Lyric3.

Participants were selected on the basis of their Lyric experience — none (n = 17), current Lyric3 users (n = 18), and current Lyric2 users (n = 12). Among the new users, 5 currently used conventional hearing aids, and the remaining were new to amplification. Two new users dropped out of the study early due to poor physical fits; only overall acceptance data are reported for these individuals. Among the experienced Lyric users, Lyric2 users averaged 4.8 years (range 3-7 years) of experience, and Lyric3 users averaged 3 years (range 4 months-7 years) of experience. During the study, all participants wore Lyric3 devices bilaterally.

Audiometric assessment revealed a good representation of hearing thresholds across the Lyric fitting range for all groups (Figure 1). Further, on average, audiometric thresholds were significantly poorer ($p < 0.05$) for Lyric2 users compared to new and Lyric3 users.

The overall sequence of study-related activities is shown in Figure 2. The study involved 3 visits to the study site over a period of 4-5 weeks. Additional interim visits were scheduled as needed on an individual basis. During each 2-week field trial, participants completed a diary on their experiences with the improved Lyric3 device during daily use.

Informed consent was obtained at the start of the study, and a modest stipend paid to all participants at the end of the study. Further, upon completion of the study, participants were given the option to continue/purchase a subscription with the improved Lyric3 device, return to their own devices (Lyric2, Lyric3 or daily wear), pursue conventional amplification (for new users) or not pursue amplification at all (for new users).

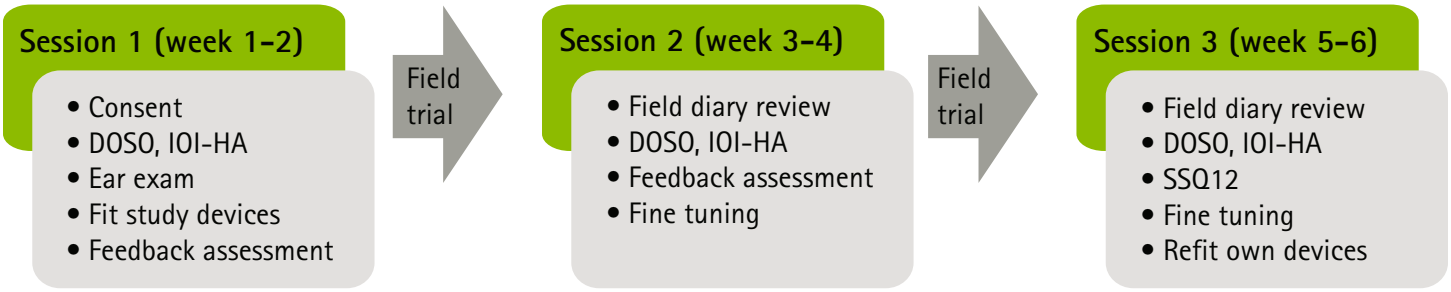


Figure 2. General sequence of study-related activities. DOSO = Device-Oriented Subjective Outcomes (Cox et al, 2009); IOI-HA = International Outcomes Inventory for Hearing Aids (Cox et al, 2003); SSQ12 = Short version of the Speech, Spatial and Qualities of hearing Scale (Noble et al, 2013).

Results

The objective of this study was to evaluate speech clarity, naturalness of sound, and overall acceptance of the improved Lyric3 device among new and experienced Lyric users. Although a variety of approaches were used to assess outcomes in each dimension, in the interest of brevity, only a representative sample of the results are discussed here.

Speech clarity was assessed using the SSQ12, which takes a broad perspective on challenging listening situations. For example, consider a commonly occurring situation where the Lyric user watches TV while someone is talking in the physical vicinity of the individual. One question on the SSQ12 asks how well the Lyric user is able to follow the TV without needing to turn it up (a task that requires selective attention), while another question asks how well the Lyric user is able to follow both the TV and the person talking (a task that requires divided attention). Ratings are provided on an 11-point scale from 0 = Not at all (poor outcome) to 10 = Perfectly (good outcome). Higher SSQ12 ratings represent better outcomes.

As shown in Figure 3, the improved Lyric3 device received a mean SSQ12 rating of 6.5 (Standard deviation [SD] = 1.6), which is in the top (i.e., better) half of scale. Further, this is higher than the norms reported by Noble et al (2013) — 5.6 and 3.9 for persons with mild to moderate and severe hearing loss, respectively.1 In fact, 76% of study participants provided SSQ12 ratings that were equal to or higher (i.e. better) than the relevant norm (based on the degree of loss). There was no significant difference in ratings across user groups (new, Lyric3 and Lyric2 users).

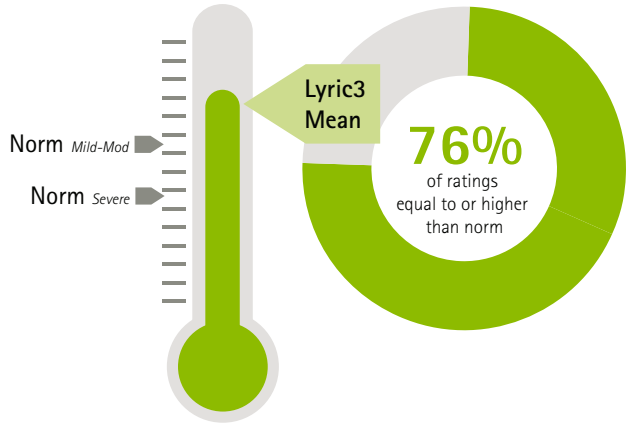


Figure 3. Mean SSQ12 rating with the imporoved Lyric3. Higher ratings represent better outcomes. Norms based on mean ratings reported by Noble et al (2013).

Naturalness of sound was assessed via subjective ratings of naturalness provided in diaries during the field trials. Specifically, participants were asked to rate naturalness on an 11-point scale (0-10); in addition to numbers, descriptive labels were provided for 1 = Very unnatural (poor outcome), 3 = Rather unnatural, 5 = Midway, 7 = Rather natural, and 9 = Very natural (good outcome). Higher naturalness ratings represent better outcomes.

As shown in Figure 4, the improved Lyric3 device received a mean naturalness rating of 7.3 (SD = 2.1), which is in the top (i.e. better) one-third of the scale. Further, 75% of study participants provided ratings of "rather natural" (7) or higher (i.e. better). There was no significant difference in ratings across user groups (new, Lyric3 and Lyric2 users).

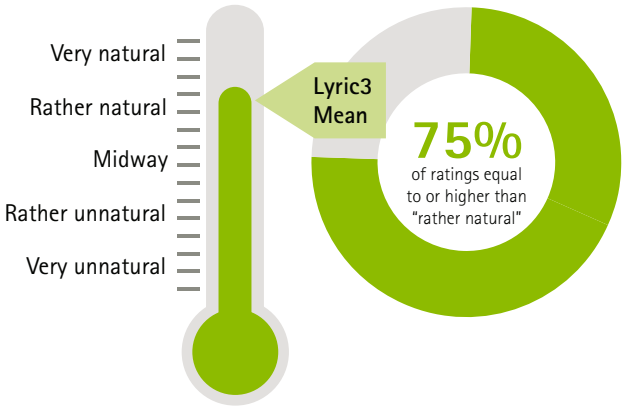


Figure 4. Mean naturalness rating with the improved Lyric3 device. Higher ratings represent better outcomes.

Overall acceptance of the improved Lyric3 device was assessed on the basis of the decision to switch to (current Lyric users) or purchase (new Lyric users) Lyric3. Recall that, upon completion of the study, participants were given the option to switch to or purchase the improved Lyric3 device, return to their own devices (Lyric3, Lyric2 or daily wear), or not pursue amplification at all (for new users).

As shown in Figure 5, all current Lyric users opted to switch to the improved Lyric3 device at the end of the study. Automatic upgrades to the latest available technology is a benefit of the Lyric annual subscription model. So, offering the option to upgrade to the improved Lyric3 device was not a special incentive (or source of bias) for the study. Further, it is not a foregone conclusion that all Lyric users upgrade to the latest technology, as evidenced by the fact that, almost 1 year after the launch of Lyric3 (i.e., at the start of the study), there were still some individuals who continued to use Lyric2 (i.e., the older generation of Lyric). As such, the acceptance of the improved Lyric3 device by all current Lyric users — Lyric3 and Lyric2 users — is noteworthy.

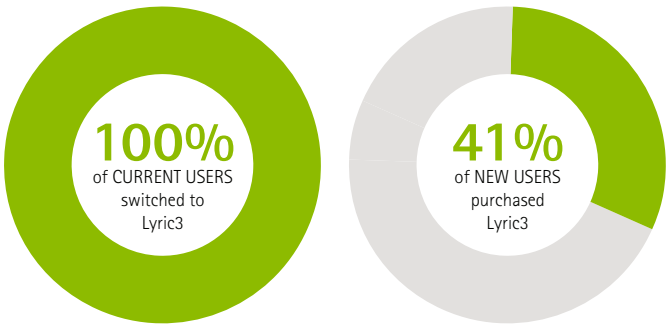


Figure 5. Overall acceptance of the improved Lyric3, described in terms of the percentage of participants choosing in favor of Lyric3.

[1]SSQ12 norms based on ratings from several hundreds of persons with hearing loss, some aided and others unaided.

Figure 5 also shows that, among new Lyric users, 41% opted to purchase a Lyric subscription. As with the current Lyric users, new users received no special incentive for this decision — i.e., all newcomers to Lyric receive a 4-week trial (i.e., the approximate duration of the study), at the end of which they must decide whether or not to purchase an annual subscription. The trial-to-subscription conversion rate obtained in this study is comparable to that previously found for Lyric3 and Lyric2. Of the new users who decided against Lyric, 2 dropped out of the study early due to issues with physical fit that could not be resolved, and 6 chose to return to/purchase conventional hearing aids citing not enough additional benefit and/or financial constraints; the status of 2 participants is unknown.

The findings of the improved Lyric3 beta validation study can be summarized as follows:

1. Lyric3 provides good speech clarity even in challenging listening situations;
2. Lyric3 provides natural sound quality; and
3. Lyric3 is accepted by new and current Lyric users

Conclusion

The findings of this study lead to the conclusion that new users, current Lyric3 users, and current Lyric2 users can successfully use the new, optimized Lyric3. Good outcomes on a number of different measures lend quantitative support for the conclusion. Further, anecdotal reports from study participants and clinicians were very positive.

References

Cox RM, Alexander GC & Beyer CM (2003). Norms for the International Outcome Inventory for Hearing aids. Journal of the American Academy of Audiology, 14, 403-413.

Cox RM, Alexander GC & Xu J (2009). Development of the Device-Oriented Subjective Outcome (DOSO) Scale. Poster presented at the 2009 meeting of the American Auditory Society, Scottsdale, AZ.

Noble W, Jensen NS, Naylor G, Bhullar N & Akeroyd MA (2013). A short form of the Speech, Spatial and Qualities of Hearing scale suitable for clinical use: The SSQ12, International Journal of Audiology, 52, 409-412.

Author and Investigator

Shilpi Banerjee, PhD, studied audiology at Northwestern University, USA. Since completing her PhD, she has had extensive experience in hearing aid research, teaching Audiology, and speaking globally on a variety of topics. In the past year, in her capacity as a consultant to Phonak-Lyric, Shilpi has overseen clinical research on Lyric3.

Acknowledgements

Phonak acknowledges participation of the following clinicians and clinics in the Lyric3 beta validation study: Lori McCorry and Meryl Miller at Audiological Consultants of Atlanta, Atlanta, GA; Mark Sanford and Tamara Anderson at Better Hearing Center of Walnut Creek, Walnut Creek, CA; Donna Szabo at Innovative Hearing Solutions, Westwood, NJ; Shelley Borgia and Seth Weible at New York City Hearing Associates, New York City, NY; Paula Rivers at Rivers-Krueger Audiology, Austin, TX; Bill Miller at South Bay Hearing & Balance Center, Torrance, CA. We also thank Brian Thompson, Laurel Gregory, Michelle Griffin & Rachelle Bogue for their logistical and operational assistance with the study.