PODCAST TRANSCRIPT

New tools in MAESTRO 7.0: AutoART

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In this podcast, we talk about the new AutoART tool, the automatic process of measuring electrically-evoked compound action potentials in the cochlea, in the MAESTRO 7.0 system software. We talk about the science behind AutoART and how this new tool provides clinicians with a fast, safe, and reliable way to objectively measure cochlear implant function and performance.

Celina Tobias-Grasso: Hello everybody and welcome. You are listening to a podcast in our series on the MED-EL MASETRO 7.0 fitting software. My name is Celina Tobias-Grasso. I'm an audiologist and Training Manager in the Education & Training department here at MED-EL headquarters in Innsbruck. Today I am interviewing Doctor Konrad Schwarz. Konrad is an Advanced Development Engineer within the Objective Measures Team here at MED-EL's Research & Development department. Welcome Konrad and thank you for joining us.
Konrad Schwarz: Hello!
Celina: So, Konrad, we are going to talk today about the new AutoART task in MAESTRO 7.0. Now, clinicians listening to us might already be familiar with the ART task which stands for Auditory Nerve Response Telemetry in the existing MAESTRO software but can you give us an overview of what this AutoART tool is in the new MAESTRO 7.0 fitting software?
Konrad: Well, AutoART is the new automatism of MED-EL to record electrically evoked intra-cochlear compound action potentials of the auditory nerve, typically called ECAPs. The existing ART Task of Maestro 6.0 will be still available but this automatism

was clearly demanded by audiologists. So, we talked to audiologists all over the world and their expectations contributed to the development. Information content, reliability, safety and speed were the main targets to be optimized. The very basic idea is to put physiologic properties into the main focus. In addition, supervision of the subject by the audiologist should be eased - especially for children. So, using AutoART, audiologists can completely focus on patients without dealing with technical aspects of the recordings.

Celina: That's great! Just to go back to what you said, basically the difference between the MAESTRO 6.0 ART task and this to MAESTRO 7.0 AutoART is the automatism that you talked about.

Konrad: Yes! Indeed!

Celina: And you mentioned also the speed, that it's going to be, because it's automatic, a lot faster. Can you tell us a little bit more about the speed? How fast is it exactly?

Konrad: Postoperatively it takes just three and a half minutes to get the full profile.

Celina: That's pretty fast! Yeah?

Konrad: Intraoperatively, the total measurement is even faster and the time is only 90 seconds.

Celina: Wow!

Konrad: In addition, we offer a "pre-check" which tells you about the ECAP presence after 30 seconds only.

Celina: Thirty seconds! Wow! And three and a half minutes! I mean how long did it use to take?

Konrad: Typically it lasted between five and ten minutes but there was a lot of settings to be set and this of course took additional time.

Celina: And I think another thing to point out to clinicians listening is that you had to have a certain level of skill to be able to interpret the ECAP recordings in MAESTRO 6.0 as well, right?

Konrad: Yeah! So, the time of five to ten minutes is just without interpretation and without pre-setting so the automatism is really done within three and a half minutes.

Celina: Yeah! That's great! So, it's fast. We talked about how fast it is now but is it also accurate?
Konrad: Well, we had a large dataset with more than 100 subjects and the automatism reported correctly ECAP presence in 96.7% of the cases.
Celina: OK! OK wow!
Konrad: In a second study we had 13 subjects enrolled and there we did repeated recordings and the threshold was confirmed within 10% accuracy. So the automatic is able to present results which are not distinguishable from the results processed by experts on ECAP recordings.
Celina: OK! Wow! Konrad, what about the clinical applications of this new task? You know, what are the clinical applications and what is their significance?
Konrad: A first application is - as it was already for the existing task - the confirmation that the hybrid interface Cochlear Implant and Auditory nerve is working.
Celina: So, basically that this Cochlear Implant is working and the auditory nerve is working...
Konrad: Yes! And a new feature now in MAESTRO 7 is that the audiologist gets a starting point for first fitting provided. So besides that, future applications concerning neural health are as well possible. Concerning neural health, independent research groups found a relation between insertion trauma and the slope of the growth function. It was clear that an automatism needs to be able to provide ECAP thresholds and slopes completely autonomous.
Celina: OK wow! What about the relationship between the ECAP responses that are going to be taken automatically now with the AutoART task and behavioral responses?
Konrad: Whereas the slope of the intensity growth function is correlated very well with neural health, single ECAP thresholds are correlated only moderately with behavioral responses, so just threshold profiles are used to estimate the profile of behavioral measures. However, loudness percept cannot be predicted with ECAP thresholds for all CI users, this might have multiple reasons like the distance between

the nerve fibers and stimulating electrode. Individual anatomy needs to be considered: Humans are different, and so are their cochleae.
Humans are different – and so are the subjective criteria for analyzing ECAP data: depending on the experts' criteria, they vary around 15% for a single dataset. So using this automatism this factor is eliminated and the correlations are theoretically increased.
Celina: Naturally, right? Because even though they are moderately corresponded with behavioral responses previously with the ART task in MAESTRO 6.0, now that there is automation, you can naturally expect that this could increase. Yeah?
Konrad: Yeah, so the variation is reduced since we simply eliminated the human factor in the analysis.
Celina: Because like we said earlier, in the MAESTRO 6.0 ART task, the clinician had to interpret it and that adds a lot into the interpretation. OK! What about the safety of the patient and reliability, Konrad?
Konrad: The safety is ensured similar to the existing task in MAESTRO 6.0 so a moderate loud security limit is set in advance. But moreover, AutoART stops as soon as ECAPs are determined so the new task is even safer as the old one. In addition to the special continuous growth of the intensity, the loudness percept is predictable for the patient and subsequently the audiologist gets really prepared to stop manually if it is necessary. To reach reliability with moderate stimulation intensity, we regarded multiple recording electrodes as well as a sequence of recordings and the whole workflow was tested in more than 75 subjects including 20 children and in all cases ECAPs were determined comfortably for the subjects.
Celina: OK! So it has been proven to be safe and also reliable.
Konrad: Yes! Mhm!
Celina: Well, that's very important information for clinicians listening. Thank you so much Konrad! I think this gives us a lot of great insight into this new AutoART task. Just as some final words... Can you give us key messages? Really, the key points that you want clinicians listening to take away from our discussion today...
Konrad: Well, all in all, this automatism provides a safe, easy to apply, reliable and very fast way to record ECAP thresholds and slopes.

Celina: Perfect! I think that summarizes it perfectly! Thank you again, Konrad for your time.
Konrad: Thank you very much!

Celina: Thank you for listening to the interview with Dr. Konrad Schwarz on the new AutoART tool. I hope you all benefited from this information. We encourage you to subscribe to our podcast and if you have any questions, feel free to write to us at e-learning@medel.com or contact your local MED-EL representative. We look forward to receiving your feedback!