How Does the Haag-Streit Lenstar Biometer Compare?

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For those eye care professionals who have decided to use a biometer to monitor axial length when attempting to slow their patients' myopic progression, the next step is to select which one. In this interview, Dr. Michael Lyons of **Focal Pointe Eye Care** in West Chester, Ohio, explains why he chose Haag-Streit's **Lenstar Myopia** device. Then, Prof. Dr. Hakan Kaymak, an ophthalmologist who helped develop the Lenstar's Age-Matched Myopia Control (AMMC) software, discusses how studies indicate this biometer compares to others and why it's important. (*Scroll down for Dr. Kaymak's interview, which is not included in this audio portion.*)

John Sailer, Editor-in-Chief, Review of Myopia Management: Hello and welcome to *Review of Myopia Management*'s interview series. I am John Sailer, Editor-in-Chief of *Review of Myopia Management*, and we are here today with Dr. Michael Lyons, optometrist from Focal Pointe Eye Care of West Chester, Ohio, to discuss the Haag-Streit Lenstar Myopia for measuring axial length. Most eye care professionals who are treating young patients to slow their myopia progression agree that monitoring axial length is imperative, and using a biometer enables them to do so. So, let's find out how Dr. Lyons feels about this. Hello, Dr. Lyons, and thank you for being here.

Dr. Michael Lyons, OD, FAAO, FSLS, IACMM, Focal Pointe Eye Care: Hi John. Thank you for having me here today.

RMM: All right, so let's get right into it. When did you bring on the Lenstar, and why did you choose the Lenstar?

Dr. Lyons: I brought the Lenstar into my practice in January 2024. I was looking for a replacement of my current biometer. My biometer was an older model, and I was looking for something to help make my practice more efficient, to utilize new technology, and be able to measure axial length in children.

RMM: How does the Lenstar differ from other ocular biometers?

Dr. Lyons: When I had to take the opportunity to explore other models than I currently was using, I really liked the fact that this device is partially automated. What

that means is it does take a little bit of the technician-dependent skill out of the measurement. Once the Lenstar is aligned with the patient's eye, it automatically takes the readings. The obvious thing is we wanted an accurate biometer. This does take highly accurate measurements, and we're also able to customize how many measurements it takes in a single reading. So, some practitioners are good with three scans on the patient's eye, some five, some 20. We're able to actually utilize that in the software, program that, and be able to take highly repeatable measurements, making this a highly efficient and precise machine.

The other thing I really liked about the biometer is the fact that it's a small footprint, and that's important in a practice where we tend to utilize a lot of technology, like a lot of us in myopia management. When we talk about how many devices we bring on in our clinic, it can get tight, so the small footprint was an important piece also.

RMM: What features did you consider when comparing to other ocular biometers?

Dr. Lyons: Looking at the accuracy was essentially one of the most important things for me. When I really started to look at the Lenstar and compare it to other devices, I was looking to make my practice more efficient, so the efficiency is so important. When I talk about efficiency, it's not just taking the measurement. I do not take the measurements myself. I have skilled staff who are able to do this, so I was confident I'd be able to bring in any device and have my staff be able to do that.
It was on the backend where I wasn't being efficient. I've been managing myopia for eight years now and have really spent a lot of time trying to make that practice as efficient as possible. But when I look at all the time that's spent on gathering the information and being able to plot the information on graphs and then being able to communicate this information to the prospective patients and prospective parents, there was a lot of time, and I don't want to say 'wasted,' but there's a lot of time spent just gathering this information, being able to put it into an efficient summary, and being able to get it to the parents and the children.
So, what the Lenstar does, and this is by far one of the strongest features of this instrument, it's able to capture the axial length, which is what it's designed to do, but we're able to put in refractive data, we're able to put in environmental data, and by utilizing all this information, put it into one report, we're able to then send out this report to the patients with a click of a button. That has saved so much time. What's really amazing is we've been able to generate these reports and utilize them more than I thought we would. The initial consultation report looks a little different from the report that goes out for let's say a six-month follow-up. And we have a report for the referring doctors. So, these reports all look a little different, but they're all utilizing information that's gathered within the Lenstar.

RMM: Sounds like efficiency is one of the highlights of the device. Do you have a favorite feature?

Dr. Lyons: One of the strongest reports is a feature developed by Dr. Kaymak. He has developed analysis called Age-Matched Myopia Control. What this feature does, which is very unique to anything else in the industry, is it looks at the natural progression of the axial length of a child. When we start treatment, it then is able to take that age-matched norm because we know that children's eyes grow at different times at different points in their life. Typically, they have a high growth, then a low growth. So, it takes those normative database values that we know are going to happen, and then when we implement myopia control, it then adjusts for that. So, it's just not a linear graph as far as growth goes. This instrument's able to tell us very easily by looking at a graph in a green, yellow, and red pattern, kind of like a traffic signal, if we're doing a good job with myopia control, or if we're doing an average job, or if we really need to change what we're doing.
On the report, it'll show how much a child has progressed in a year, and if that progression is beyond the age-matched norm of that child, it'll present it in a red area of the graph. If it's just borderline, it'll be in the yellow area. If we're doing good and it's either age-matched or even below the age-matched norm, it'll report in a green section of the graph. So, just at a quick glance, anybody's able to look at that and see the success of the myopia management.

RMM: Great feature and exclusive to the Haag-Streit Lenstar. So, in your day-to-day practice, could you describe how you use the Haag-Streit Lenstar in your myopia management?

Dr. Lyons: This is one of the big things that really have changed for me because when I was managing myopia, we would talk to the parents a lot about myopia, but we wouldn't really give them any data beyond the axial length and the refractive error and say, 'Listen, your child's progressing. Let's have you come in for a consultation. We'll talk more about it.' That's where we left our myopia management advertising within the practice. Now, with the Lenstar, this is very different. What happens is every child gets a Lenstar measurement prior to their exam, and then after the exam, we then input the refractive values. Within three days, we send a report out to every child below the age of 18 that was in our practice. That was not happening before the Lenstar. Again, it came down to efficiency of the practice and the time needed in order to be able to gather all that data and get it to the parents.
So, now with the Lenstar, we're able to generate that report, send it out to the parents and say, 'Listen, your child's eyes are growing too fast and too long, and they're becoming weak. We need to implement myopia management in order to help your child see better later in life.' That's really what it comes down to is being able to

start the kids as early as we can in order to prevent conditions like myopic maculopathy and glaucoma and cataract changes. It's really exciting to be able to get this data, get it summarized, and get it out to the parents very quickly.

RMM: Very exciting, great information to share with the parents and keep them informed. So, about the parents now in my last question, what are the parents and patients saying about the Lenstar?

Dr. Lyons: As far as what the patients and parents think, they don't really understand what our instruments are in our practice, so they just think it's another instrument. But what I can tell you is we've had more and more interest in myopia management, more and more questions since starting this. That's where I was failing as a practitioner because I've been fitting scleral lenses for over 20 years and now fitting orthokeratology for well over 15 years in myopia management with eight years of experience. We were horrible internal marketing experts. We were failing in that. Now, with being able to send reports out after every exam, it is definitely generating an internal buzz where patients are talking about it and asking more questions. It's leading to more children entering into the program, which is important for our practice. But really, again, it comes down to helping kids hopefully see better the rest of their lives. And that's really the end point there.

RMM: That is, exactly. Thank you, Dr. Lyons, for sharing your experience with the Haag-Streit Lenstar Myopia.

Dr. Lyons: Thank you, John. I appreciate it.

RMM: And thank you, Haag-Streit for sponsoring this interview, and thank *you* for listening.

Review of Myopia Management then interviewed ophthalmologist Prof. Dr. Hakan Kaymak, who was involved in the technology behind the Haag-Streit Lenstar Myopia, which Dr. Lyons discussed in the first half of this interview. Find out here now from Dr. Kaymak what makes the Lenstar biometer different.

RMM: You have done an interesting study on various biometers and their use in myopia control in children. Can you give us an overview of your results?

Prof. Dr. Hakan Kaymak, MD:

Yes, I can. In our study, we compared four different biometers to find out how well these devices measure axial length in children to monitor myopia progression. We examined a total of 22 myopic children and measured their axial length, as well as corneal parameters such as curvature and astigmatism. One of the most important questions was how well the devices can repeat measurements – known as repeatability. The Lenstar LS900 was shown to be the most accurate with a repeatability of 0.04 mm.

Another important finding was that when monitoring eye growth, there should be at least six months between measurements to reliably detect changes. This is especially true if we want to observe a growth of 0.1 mm per year, which often indicates a progression of myopia. That allows us to use the AMMC system precisely.
In summary, all devices offer good measurement accuracy, but the Lenstar LS900 has shown the highest repeatability. It is important to use the same device for myopia monitoring to ensure consistent results.

RMM: You mentioned the AMMC technology earlier. What exactly does that mean?

Prof. Dr. Kaymak: AMMC technology stands for Age-Matched Myopia Control and is a special feature of the Lenstar Myopia System. This technology compares a child's axial length growth to age-matched normative values of children who are experiencing normal, emmetropic growth. This means that the system assesses whether a child's axial length development is within the normal range compared to other children of the same age, or whether there are signs of accelerated myopia progression. This helps doctors to identify early on whether treatment is needed or whether existing measures should be adjusted.

RMM: You also mentioned the term 'emmetropic eye growth.' What does that mean exactly?

Prof. Dr. Kaymak: Emmetropic eye growth refers to the normal growth of the eye, where it develops in such a way that light is correctly focused on the retina. An emmetropic eye has no refractive error because the refractive power and the length of the eye are perfectly aligned. The goal of myopia control is to get eye growth as close as possible to this emmetropic pattern to prevent the eye from becoming too long and developing progressive myopia. AMMC technology helps monitor these normative values and ensure that growth remains within expected healthy limits.

RMM: Are there differences in emmetropic eye growth between Asian and non-Asian eyes?

Prof. Dr. Kaymak: In principle, emmetropic eye growth – that is, normal, healthy eye growth – should be the same for all people, regardless of their ethnicity. This means that the eye's development aims to focus light correctly on the retina so that no visual impairment occurs.
However, epidemiological studies show that there is a much higher prevalence of myopia in Asian countries, particularly in East Asia, indicating that eye growth in these populations more often deviates toward myopic (short-sighted) changes. This could be due to a combination of genetic factors and environmental influences, such as more intense near vision (e.g. a lot of screen time or reading) and less time spent outdoors, which particularly affects children.
Although the physiological mechanisms of emmetropic growth in Asian and non-Asian populations are the same, it appears that environmental influences and possibly genetic predispositions in Asia lead to higher rates of myopic deviation.

RMM: Is there any study that supports your thesis?

Prof. Dr. Kaymak: The **study by Fabian S. L. Yii** and his team aimed to compare axial eye length (AL) growth in emmetropic individuals from East Asian and non-East Asian populations. The specific question was whether there are differences in eye growth patterns between these ethnic groups.

RMM: What were the key findings of the study?

Prof. Dr. Kaymak: The study found that there are no significant differences in axial eye length growth patterns between East Asian and non-East Asian emmetropic individuals. In both groups, the rate of axial eye length increase slowed markedly between 6 and 11 years of age. By about 16 years of age, growth had almost stopped.

RMM: How does this research relate to the prediction of myopia?

Prof. Dr. Kaymak: The study suggests that axial length growth curves may be used across ethnic groups to predict the development of myopia. This could facilitate the use of such curves in clinical practice. However, further research is recommended to fully validate this possibility. The study's conclusion that axial length growth curves are comparable across ethnic groups supports the AMMC concept of using only one common emmetropic growth curve. This could provide a simplified and more effective method for predicting myopia development that is equally applicable to different population groups.