

# Haag-Streit's New AMMC Software Monitors Efficacy of Myopia Treatments

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Several therapeutic options available today for myopia management have been proven effective in controlled clinical trials, and as practitioners, we can freely choose among them. However, we still need to find out the optimal therapy for an individual child and how we should assess the therapeutic efficiency of the currently selected treatment option.

Clinical trials commonly rely on comparing cohorts of myopic children who are either treated or left untreated and assessing the treatment effect size in terms of the degree of suppression of the myopia progression in the unlucky untreated control group. So, in clinical trials, every therapeutic option for myopia management brings about some percentage of reduction of myopia progression. But how do we know if the current treatment is sufficient for a patient? In more practical terms, what is the therapeutic goal in myopia management?

### Monitoring Treatment Efficacy

Haag-Streit's new AMMC (Age-Matched Myopia Control) framework was designed to set a therapy goal for myopia management. We know that from birth to the state of late adolescence, the human eye is constantly growing, from a high rate in early childhood to a much lower rate in adolescence.

#### ADVERTISEMENT

Emmetropes have a "history" of axial eye growth that lies within a genetic corridor. In other words, the growth pattern of emmetropic eyes corresponds to the eye's physiological growth.



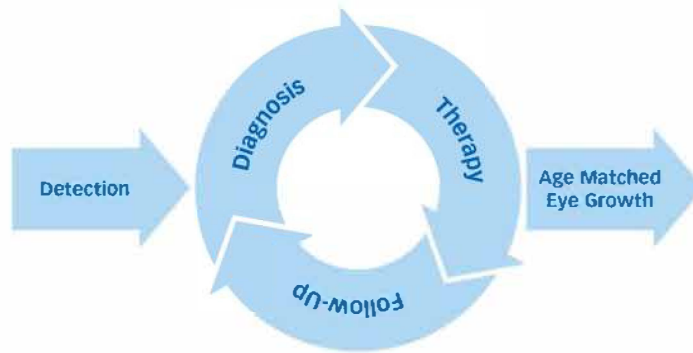
The traffic light system on the AMMC software makes it easy for patients to understand.

Now, if the axial growth of a child's eye follows this corridor of physiological growth, the eye will remain or become emmetropic.

In contrast, progressive myopia is caused by increased eye growth, where the eye will eventually grow too long so that the retina can no longer catch a sharp image of distant objects. We understand that myopes' increased growth rate is more than the underlying physiological growth of emmetropes. We thus define physiological growth as the therapy goal for myopia management.

While we see sex differences in the physiological growth between boys and girls, the physiological growth is more or less universal. That means there is only a small difference between European or Asian eyes when we focus on emmetropic eyes; only there are hardly any emmetropes in Asia. With AMMC, we compare the actual eye growth of a child under myopia management as measured by optical biometry with the age-matched average physiological growth. The closer we get to the respective physiological growth, the more efficient myopia therapy is. For example, if we look at the results of the clinical trials, we find some therapeutic options, such as multi-segmented glasses (e.g., DIMS), an average reduction in myopic progression by 60%, which is currently promoted as the therapy effect. From the same data, we can draw that in the myopic patients the therapeutic option has affected, on average, a full "return" to physiological growth. This we consider a therapy effect of 100%.

One of our primary goals with the AMMC is to have a quick and safe assessment of the efficiency of the current therapy option. Practitioners want to know if the current therapy is "working" or if additional or alternative options need to be considered. AMMC is simple, reliable, and universal, as it relates all measured eye growth to the normative values of an average emmetropic child of the same age. This is very intuitive as it is very similar to what we are used to in other medical and even technical fields, where there are normative values and limits, for example, blood pressure, blood cholesterol, etc. Patients and practitioners alike are accustomed to watch and judge physiological parameters based on normative values. This inherent simplicity also serves as the second goal, which is that patients and their parents receive helpful information about the current status of the therapy.



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### **Benefits for Practitioners**

Until now, when parents asked about the success of the treatment or how much longer their child had in treatment, there was no definitive answer. For the first time, we have the opportunity to monitor our myopia management therapies. We can assess whether we have achieved our therapy goal, how far we still have to go, or, as the case may be, whether we are already at risk of overtreating the patient with therapy options that are too intense, such as a highly dosed pharmaceutical intervention, where a milder treatment option would be a better choice.

AMMC, first of all, employs a simple traffic light system to judge the current efficiency of the therapy. The therapy is highly efficient if the assessed eye growth rate is located in the “green field” of the AMMC scheme. If the assessed growth rate falls into the “yellow field” or even the “red field,” then there is still a way to go with myopia management. Based on this scheme, we can address the patient and find a better therapy option, whether that is an increase in the concentration or dosing interval of a low-dose atropine therapy or the combination of optical and pharmacological therapy options.

The simplified but reliable color-coded scheme and traffic light system for the classification of therapeutic efficiency is not only easy for the practitioner, who can build and develop their expertise on a lucid and standardized scheme for the benefit of patients, but it is also advantageous with the patient, as it is easy for non-professionals to visualize, as it follows the common idea of normative values and limits.

In a second aspect, and apart from the traffic light system, AMMC also gives the percentage of how much the actual axial eye growth of the patient is in excess of the normative physiological growth. So, even if a patient's eye remains in the "red field" in the initial treatment periods, the practitioner might still be able to communicate a first therapeutic success based on these percentage numbers, as we have learned that even the slightest experience of self-efficacy can fundamentally increase or maintain treatment compliance.

### **Embracing the Latest Technologies**

**Lenstar Myopia** combines Haag-Streit's well established **Lenstar 900** optical biometer with powerful **EyeSuite Myopia** software.

For myopia management, the need for therapy should be judged by axial length measurement. If, at the initial examination, the axial length of an eye is greater than the average axial length of an age-matched group of children who remain emmetropic, the practitioner should consider recommending myopia therapy. This initial assessment to start therapy can be done in Haag-Streit's EyeSuite Myopia.



Haag-Streit's AMMC framework works with the Lenstar Myopia and the EyeSuite myopia software.

With the AMMC framework, EyeSuite Myopia allows the practitioner to monitor the course of the therapy further. At the second visit (which should take place not less than 10 months and up to 14 months after the last visit), where biometry is recorded for the second time and the actual eye growth rate is assessed, the practitioner and the patient will obtain a clear picture of the efficiency of the current therapy. This assessment can be made at all follow-up visits, and the practitioner can decide whether the therapy is to be continued or the therapy goal is reached.

The Lenstar 900 is Haag-Streit's latest **optical biometer**, equipped for axial length measurements, keratometry, and vitreous chamber depth; it also has unique features such as refraction, biometry, and environment that allow practitioners to customize patient care. Similarly, Lenstar 900's improved measuring scheme enables practitioners to measure children quickly, precisely, and with high repeatability - vital for longitudinal analyses and follow-up examinations. This allows us to have shorter intervals between the measurements and, therefore, to assess therapeutic efficiency earlier or more reliably.

### **Performing Full-Scope Myopia Care**

If you want to perform contemporary myopia therapy in your practice, then the biometer is inevitable because you can use it to assess myopia quickly and precisely. We want to achieve a reduction in axial length growth. Refraction depends on several factors, from corneal refractive power to anterior chamber, lens thickness, and axial length. But eye length growth is vital for us to prevent pathological myopia. For this reason, eye length growth must be measured.

The AMMC method is exclusive to Haag-Streit, and it is only available, as standard, in the **Lenstar Myopia**.



**Prof. Dr. Hakan Kaymak** is an ophthalmologist, eye surgeon, and chief surgeon at Breyer, Kaymak & Klabe Eye Surgery in the area of retinal, macular, and vitreous body surgery. His range of therapies includes laser treatments, innovative combination therapies, and minimally invasive operations, as well as the prevention and treatment of myopia in children. He has experience from more than 45,000 surgeries. Since 2022, he has been a Focus Top Physician for retinal diseases, as well as for refractive surgery and cataracts, and in 2023 he was included in the Stern physician list.