

## Helping relieve new visual demands

Thomas Gosling<sup>1</sup>

<sup>1</sup> Optometry consulting, Colorado, USA

Today's visual environment is much different than it has ever been. Within a blink of an eye, we have brought our world to an arm's length away and it's at a critical mass. Personal smart phones came into existence just ten years ago with the first iPhone. Now, more than 80% of Americans own a smart phone! Six years ago, Apple's first-generation iPad was released in 2010 and now 50% of Americans own one. These new devices differ from our traditional computers, not only in their size and portability, but how close we hold them to our eyes. With the barrage of digital media devices in society's hands and a world of information at our fingertips always comes excessive amounts of eye strain, even in young eyes.

Hoya's Sync lens, known as Nulux Active in Europe and Remark in Asia, has been designed to take on the rigors of our new visual world by allowing an active area of relaxation when presented with near tasks, all while reducing the distortion that a progressive lens presents. This lens design helps create a comfortable day's end, especially after high digital media usage. The Sync lens, which will be referred to in the article by its European name - Nulux Active, was created to help all ages with these new visual demands, but primarily to help our youth and young adults with their constant involvement texting, playing, surfing and working on these new devices for prolonged amounts of time. Schools are taking this portable technology to the classrooms. Books are becoming digitally converted and apps are allowing for creative learning. Our kids are taking to this new technology in the droves. As the surge of this near demands becomes a standard from the classroom to the family room, so too are the symptoms of eye strain becoming prevalent in the exam lane.

How successful Nulux Active can be in helping relieve these new visual demands is the reasoning behind this study. The Nulux Active lens is a back surface (Trueform) optimised lens that has a vertical aspheric front surface and an aspherical or atoric back surface with soft progression distribution over the entire surface (figure 1). The asymmetric design creates an edge to edge active area allowing +0.88D (Nulux Active B) or +0.55D (Nulux Active A) of relaxing accommodative power (figure 2).

12 optometrists were asked to prescribe the Nulux Active lens in a 6-8-week period to patients that fell within the criteria of our study. These criteria related to the amount of time spent on a tablet/smartphone and/or on a computer, as well as, the presence of symptoms of eyestrain. When the symptoms were significant and the near visual demand high, Nulux Active lenses were prescribed to determine if any resolution of eye strain would result. From the 12 optometrists, 87 patients were found to fill the criteria.

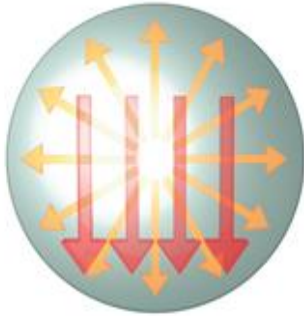


Figure 1: Horizontal and vertical aspherisation

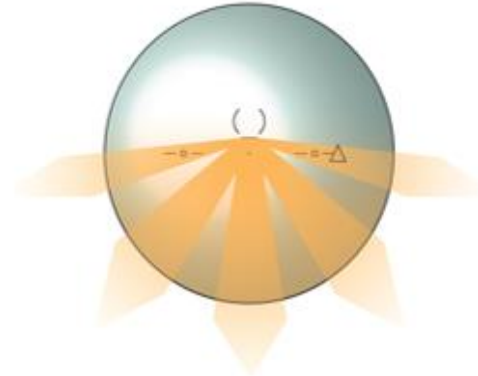


Figure 2: Accommodative support shifts gradually towards values up to +0.53 D (Nulux Active A) or +0.88 D (Nulux Active B)

## Method:

Each optometrist was asked to prescribe Nulux Active when they deemed its use beneficial in situations where extensive eye strain was noted. The age was unimportant, but suggested for patients under 45 years old. When a patient was selected for the study, each was asked to note any one or more symptoms of eye strain. These symptoms included headaches, fluctuation in vision, light sensitivity, tired eyes, dry eyes, poor night vision, eye rubbing, and decreased concentration at near, eye twitching, vertigo, double vision and overall body fatigue. Each patient also described the amount of time they spend on a tablet/smartphone and a computer on an average day. The values ranges were less than 1hr, 1-3 hrs., 4-6 hrs., 7-9 hrs. and greater than 10 hrs. A brief description of the reasoning for prescribing the Sync lens was also asked of from the doctors. After 2-4 weeks, there was a follow-up with the patient to document their overall “happiness” with the Nulux Active lenses. This follow-up was submitted as a brief description by the doctor, relaying the patients overall comfort.

## Findings:

Eighty-seven patients were found to be candidates for the Nulux Active lens study. The ages of the patients ranged from 7 to 55 years old, with an average age of 26.14 years old and a median age of 26 years old.

Time spent on these devices varied, but more so with computer usage. Of the 87 overall patients, 78 responded with time spent using a computer. Ninety-two (92%) of the responses fell within the 1-9 hours a day range, 54% used the computer 1-6 hours a day and 52% were on a computer 4-9 hours a day. The largest group, representing 29% used a computer 1-3 hours a day.

Tablet/smartphone use showed a more constricted grouping. Sixty-nine (69) patients responded to using a tablet/smartphone on an average day. Eighty (80%) percent of the patient group fell

within the 1-6 hours a day of use. Most responses (35) were with the 1-3 hours a day, representing 51% of the patients.

AGE	COMPUTER HOURS OF USE				
	<1hr	1-3hrs	4-6hrs	7-9hrs	>10hrs
0-10	0	7	1	1	0
11-20	0	13	4	5	1
21-30	0	2	4	8	1
30-40	0	3	6	8	1
>40	0	2	5	3	3
	0	27	20	25	6 = 78

AGE	TABLET/SMARTPHONE HOURS OF USE				
	<1hr	1-3hrs	4-6hrs	7-9hrs	>10hrs
0-10	2	4	0	0	1
11-20	2	6	7	2	1
21-30	0	7	5	1	0
30-40	0	11	5	2	0
>40	0	7	3	0	3
	4	35	20	5	5 = 69

Each patient was asked to note all their symptoms regarding eye strain. From the 87 patients, 239 symptoms were stated. That's 2.8 symptoms per patient. We reduced the overall symptoms total to 228, removing eye twitching (3 responses), vertigo (3) and diplopia (6) from the list as their responses were so minimal. The commonest reported symptom of eye strain taken from the list was 'fluctuation in vision', with 45 complaints or 52% of the patients. Tired eyes (38 complaints) and headaches (37 complaints) were not far behind. Closely following with 34 complaints was "overall body fatigue". The eye strain complaints fell from there with "decreased concentration" (27 complaints), "decreased vision at night" (20), "dry eyes" (20), "photophobia" (15) and "eye rubbing" (12).

Each age group had their own pattern of eye strain complaints:

Symptoms	Age 7-10	Age 11-20	Age 21-30	Age 31-40	Age >40
Decreased concentration	6	13	2	3	3
Fluctuation in vision	5	13	11	11	6
Tired eyes	4	9	9	10	8
Headaches	4	10	9	9	5
Eye rubbing	4	2	1	2	3
Overall body fatigue	3	7	6	10	9
Dry eyes	0	5	6	5	4
Photophobia	0	3	5	5	4
Decreased night vision	0	2	7	4	7

## Conclusion

Patient satisfaction to how well they adapted to the lenses and eye strain relief was determined by a follow up phone call or revisit to the optometrist. Each doctor submitted a brief description or quote from the patient. These responses were weighed by the positive or negative attitude of their comments.

Eighty-seven (87) patients entered the study, but eleven (11) were lost in follow up. Seventy-six (76) patients gave their follow up responses to their new Nulux Active lens use.

- 20 were extremely happy with their new lenses;
- 44 were happy;
- Eight were just satisfied with their new lenses;
- Four patients were unhappy with their Nulux Active lens experience;
- Two reported being uncomfortable with the distortion.

Both of distortion complaining patients were wearing single vision free form lenses before trying the Nulux Active lenses. Overall, sixty-four (64) patients or 84% of the Nulux Active study patients were happy or very happy with the Nulux Active lens and its ability to reduce their eye strain symptoms. Only 5% found the Nulux Active lens uncomfortable or ineffective in its ability to reduce their eye strain.

While this was a very limited study in its numbers and subjective responses, the overwhelming positive results of the patient base to resolve their eye strain must be noted. In a world where digital devices are becoming the normal in such a short period, digital media strain to the visual system will not just be a problem of the presbyopes.

## Acknowledgments

The author thanks all optometrists who participated into this study.

This is a modified version of the original article which has been published in Optician Journal. The author thanks the Optician team including Bill Harvey for helping him with the publication of this article.