



The World Is Just a Few Centimeters Away

The challenges facing our eyes are changing radically – opening up new opportunities for eye care professionals in the digital world

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The past few years have seen a major increase in the time we spend using digital devices in our everyday lives. In the near future we may well be using these devices practically without interruption. For many people, the day starts online with their smartphone. During the day, the PC dominates the everyday working world, while smartphones and/or tablets are used during breaks and in the evenings.

The digital world is primarily visual

Eye care professionals can tap into new business potential if they focus their attention on this development. The constant use of digital displays has become a way of life these days and is radically changing the demands being made on our eyes. More and more people – not only eyeglass and contact lens wearers, but also people requiring no visual correction – are now complaining of symptoms that are attributable to the exceptional strain to which our eyes are being subjected. Many of the visual problems now being encountered are already well-known from the early days of computer screens at the workplace – eye irritation, for example, caused by the reduction in blinking resulting from concentrated viewing of the screen (1). The cornea dries out, and a burning sensation is felt in the eyes which are then rubbed, leading to even more irritation.

Now, in the digital age, even more strain awaits our eyes. And this is by no means limited to people who spend their day in the office. According to information compiled by the IDC market research organization, one billion smartphones were sold all over the world in 2012 alone (2). This corresponds to an increase of 38.4 percent over the previous year. In actual fact, there are now more digital mobile devices in the world than people.

Moving closer

The problem is that our eyes are not intended for the digital world. The challenges vary greatly from one type of device to another. These days, life – or at least a major part of

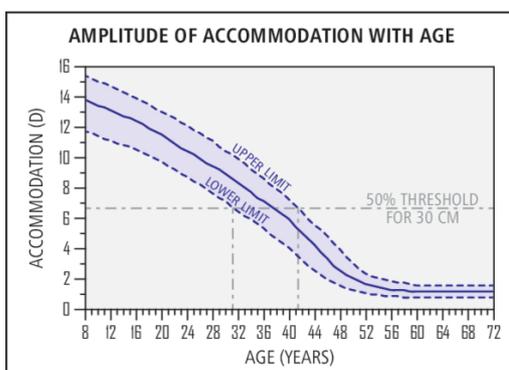


our job and leisure activities – takes place right "in front of our noses." No-one needs to get on a plane any more to explore the world. Whether we want to talk with colleagues, business partners or friends, we no longer have to leave our homes if we do not wish to. TV screens, computer monitors, tablets or smartphones are all there to show us everything we want to see. Digital displays are our constant companions wherever we go.

What does this mean in concrete terms for our eyes? In a word: stress. As studies have shown, visual problems are experienced by around 75 percent of computer users. This can come in the form of eye strain, headache and pain in the neck and shoulder areas as a result of the changes in our posture required by concentrated viewing. Such symptoms that are typical of traditional work at a computer can also be encountered with mobile digital devices. Studies conducted by the Vision Council in the USA show that more than two-thirds of adults who regularly use digital displays experience physical problems that are related to eye strain (3).

A special challenge to our eyes – beyond vision at a "traditional" PC – is posed by the now popular smartphones and tablet computers. Intelligent mobile phones in particular are strenuous on the eyes. Although they now offer screen sizes of over 12 centimeters (image diagonal), the font size of Internet offerings or text files is still so small that these devices have to be held at a different distance than a newspaper or book: the user has to move closer to the device. Very few devices set a different font size because otherwise the user would lose sight of the "big picture." Cell phones and tablets generally require a reading distance of 30 centimeters, while books are normally held at around 40 centimeters from the eyes.

Vision can become a real challenge



A study on media use showed that smartphone users in Germany look at their display for an average of one hour every day (4). While young people can rise to this challenge with relative ease, adults notice that their eyes are subjected to considerable strain. And this also happens at an age when they are not even thinking of reading glasses.

This increasing strain is attributable to the ability of our eyes to accommodate, i.e. to adapt to different distances. This decreases with age. The natural lens of the eye loses



some of its elasticity, requiring more effort when we focus on objects in the close-up range. Therefore, between the age of 30 and 45, we may already start to notice that it is becoming more and more strenuous to focus our eyes on small screens.

Constant toing and froing

In addition to the "static" factors contributing to eye stress, there is another decisive aspect that is very typical of smartphone use: the constant need for the eyes to adapt to different distances. While constantly viewing at the same distance can cause strain at standard computer workstations, it is the constant switch from looking up to observe the surroundings and back to the display again that causes problems in the use of digital mobile devices. Here, the rapid switch between convergence and accommodation may become a stress factor for the eyes.



Rapid switch between convergence and accommodation may become a stress factor for the eyes

With the new ZEISS Digital Lenses, eye care professionals can now offer consumers a solution to alleviate these difficulties. Digital Lenses help the wearer to see the images more quickly, therefore reducing the effort required for convergence and the muscular stress.

A survey of around 800 participants aged between 30 and 45 confirmed that 61 percent of users complain about eye fatigue, 38 percent of irritated eyes, just under two-thirds of neck pain and 31 percent of headache (4). Wearers of the new ZEISS Digital Lenses had four times fewer complaints during normal use of their digital devices than with single vision lenses or without eyeglasses. In general, over 90 percent of the participants were very satisfied with the properties of the ZEISS Digital Lenses (5).



Wearer tolerance of the new lenses is high, and the switch from the distance to near range is no problem, even for "untrained" eyes.

Lens design for the digital world

The lenses are precisely tailored to the conditions encountered in our digital world. Designed for wear in different situations the whole day long, the lenses offer a very large distance zone with edge-to-edge sharpness and with practically no distortion. Here, they offer practically the same performance as the familiar single vision lenses. Additional zones are integrated into the lens that optimize vision in the range of around 30 centimeters which is typical of digital devices and shorter than when reading a newspaper. Here, ZEISS Digital Lenses assist near vision with an addition of 0.5 to 1.25 diopters.



Near and distance zone of ZEISS Digital Lenses

The Digital Lenses are focused on the needs of the core target group: 30-to-45-year-olds who constantly use digital devices and are increasingly noticing eye strain and impaired visual comfort in the near range.

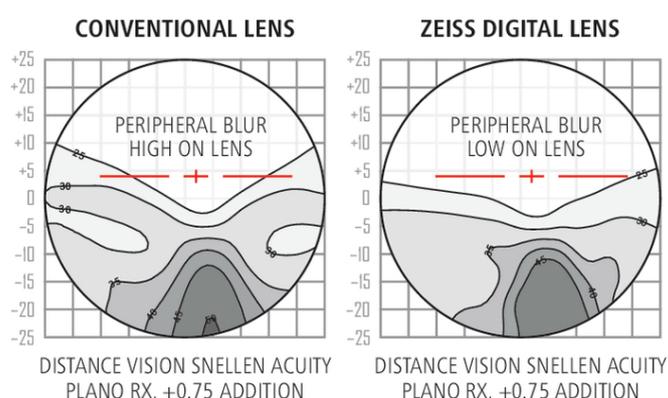
30-to-45-year-olds either wear no eyeglasses at all or

have become accustomed to wearing glasses for distance vision. Progressive lenses may be of assistance for problems with near vision, but people in this age group often avoid switching to progressive lenses due to the association of these products with approaching middle or old age.

To ensure easier adaptation to this new lens design for inexperienced wearers, the distance zone of the Digital Lenses has been increased in size and the transition integrated at a lower height in order to imitate the conditions they experienced with distance eyeglasses as far as possible. In addition, they normally have no problems with intermediate vision, which is why the design features a short progression with a rapid increase in power. The distance zone is used for intermediate distances. The very short progression and the S-shaped corridor with a gentle entry into the progression, the rapid increase in power and the gentle exit into the near power all make it easier for the wearer to switch to the new type of lenses. This special design considerably facilitates the use of the lenses for all-day wear or as an alternative to single vision lenses.



For this new category of lens, ZEISS has used its broad spectrum of experience as a leading provider of progressive lenses in order to develop a lens with clearly different characteristics. The large near range for the use of digital devices can be reached with minimal eye and head movement. Furthermore, the zone of the slight progression – and therefore of inevitable peripheral blurring – starts below the transition zone of typical progressive lenses.



This means that ZEISS Digital Lenses, whose wearers do not require any support at the otherwise standard viewing distances, provide the same impression as single vision lenses in practically all viewing

directions. And when near vision is required, the lenses provide relaxed, focused vision of the digital displays. In line with the shorter viewing distance, the inset of these lenses has been increased to support near vision.

In addition, the design of the Digital Lenses can be adapted to the frame selected by the wearer and to fashion requirements. With a minimum glazing height y of 14mm, the design varies automatically in the area of the transition zone if the fitting height y is specified in the order. If no fitting height is specified, a value of 16 mm is assumed and the lens is optimized accordingly.

Recognizing eye strain

The target group for Digital Lenses ranges from 30-to-45-year-olds. The eye care professional should address these clients within his or her geographical area and arouse their interest in the visual challenges posed by the digital world. Not all of them have yet noticed the symptoms of eye strain. Some of them simply assume that tiredness or strain are simply due to a hard day at work.

ZEISS has now developed an app that eye care professionals can use on site during consultations to recognize signs of digital eye strain. It offers an accommodation check, in which the client has to switch constantly between viewing a distant object and the display. The app runs on tablets with an iOS or Android operating system. If the test reveals that the client is exposed to a high degree of eye strain, this is a good starting point for the eye care professional to look in more detail at the client's visual requirements in his or her everyday digital life.



Customers notice the benefits

With a wide distance zone and targeted support of near vision, all tailored to the use of digital mobile devices, ZEISS Digital Lenses close the gap between single vision and progressive lenses. Initial experience has shown that customers in the given age group are greatly interested in the performance offered by the lenses and readily understand the benefits they offer. The new lens exactly meets the expectations of the market. The eye care professional is faced with the challenge of reaching those members of the target group who do not yet wear either eyeglasses or contact lenses. The use of digital communication channels – social media, eMailings, Internet presence in conjunction with the consumer app – would be a logical and promising solution here.

(1) "Office Eye Syndrome" or "Sicca eye syndrome", cf. ICD-10 / H19.3

(2) IDC: *Worldwide Mobile Phone Tracker*, www.idc.com, 27 January 2014

(3) The Vision Council: *DigitEYEd: The Daily Impact of Digital Screens on the Eye Health of Americans*, 2013. Study conducted by VisionWatch using a random sample of 110,000 US citizens in October 2013.

(4) Online survey of around 800 participants from Germany and Austria conducted by IMW-KÖLN, on behalf of Carl Zeiss Vision International GmbH, 2013

(5) Wearing trial with ZEISS Digital Lenses conducted by Carl Zeiss Vision International GmbH, 2013