

COMPETENCIES COVERED

Dispensing opticians: Communication, Standards of Practice, Optical Appliances

Optometrists: Communication, Standards of Practice, Optical Appliances



Dispensing for devices in work and play

By Nick Walsh FBDO

This article aims to provide background information on the use of digital devices, the types of devices used, and how they are used. It will then expand into the area of ergonomics and how this could provide essential information for a dispensing optician (DO), especially when considering communication skills and the resulting lens types recommended for specific tasks.

Right or wrong, access to the internet is now considered a basic necessity for adults and children alike, whether that be at work, home, in education or socially. Connectivity involves many types of different devices used in a plethora of different ways, meaning that connectivity is much more mobile.

Table 1 shows that almost all 16 to 54-year-olds go online, with more than half of the 75 years plus age group going online too.

DEVICE USE IN THE UK

As mentioned, connectivity and devices are becoming more mobile. The trends between 2016 and 2018 for the UK (**Figure 1**) show a growth in the use of mobile/smartphones, tablets and other mobile devices including wearable technology to access the internet. Before looking at the implications of hand-held and mobile device use, a more conventional set-up in an office environment will be considered.

As opticians, we need to be mindful of how our patients use devices now and in the

AGE GROUP (YEARS)	% ONLINE
16-24	98
25-34	97
35-44	97
45-54	96
55-64	82
65-74	65
75+	53

Source: Adults' media use and attitudes report 2018 – Ofcom – 25 April 2018

Table 1: Internet use by age

future. **Figure 2** shows what many people would perceive as a typical workstation set-up, and many ergonomic studies have been done to provide guidance on how to set up the user in the desk/chair/device dynamic. When dispensing spectacles for patients to wear in the workplace, it might be easily be assumed that their visual requirements would be similar to those shown in this 'conventional' set-up. But is this always the case?

A fairly common variation nowadays is the use of a standing desk. In the author's experience, some employees prefer this over the conventional seated desk as they

find it more comfortable. Some employees may use a both a seated and standing desk, and the accepted advice is that the sit/stand ratio should be between 1:1 and 3:1¹. With a standing desk, any implications linked to working distance from screen and keyboard – or the possibility of a touchscreen (see later) – may have to be considered.

WHAT IS ERGONOMICS?

The International Ergonomics Association defines ergonomics as: "...the scientific discipline concerned with the understanding of interactions among humans and other elements of a system, and the profession that applies theory, principles, data and methods to design in order to optimise human well-being and overall system performance"².

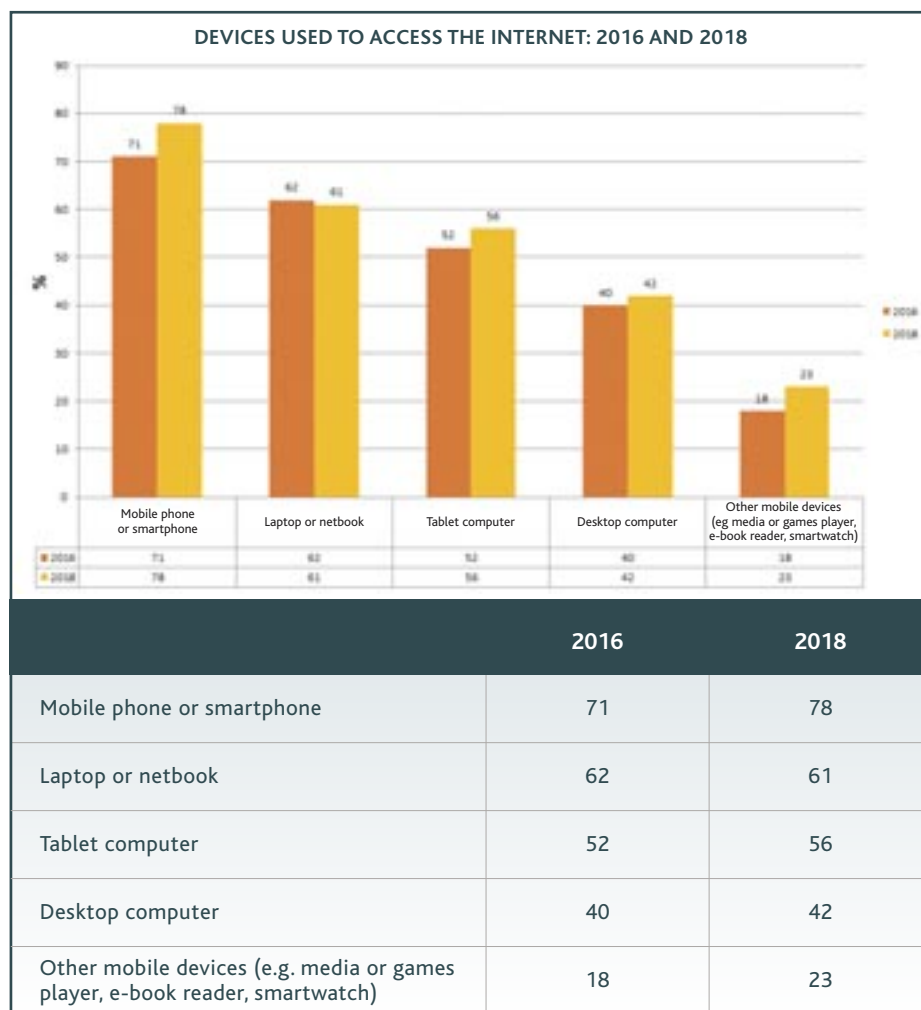
For a company's Health and Safety officer, there are a variety of online software packages that can assist for the optimal set-up of workstations – be they seated or standing. For example, **Figure 3** shows suggested set-up for a user of height 1.85m (6'1"). The software simply requires you to input the height of the user³.

Recommendations for screen position are not black and white, but the general consensus is to have it 50-76cm (60cm is suggested) from the face for a standing desk. As a quick reference, the distance should be no less than from the tip of the middle finger to the elbow. The top of the screen should be at eye level, with a small upwards tilt of between 10 and 20 degrees.

This article has been approved for 1 CET point by the GOC. It is open to all FBDO members, and associate member optometrists. The multiple-choice questions (MCQs) for this month's CET are available **online only**, to comply with the GOC's Good Practice Guidance for this type of CET. Insert your answers to the six MCQs online at www.abdo.org.uk. After member login, go into the secure membership portal and CET Online will be found on the L menu. **Questions will be presented in random order.** Please ensure that your email address and GOC number are up-to-date. The pass mark is 60 per cent. The answers will appear in the January 2020 issue of Dispensing Optics. The closing date is 9 December 2019.



C-71436



Source: Office for National Statistics - United Kingdom: electronic device usage 2016 to 2018

Figure 1: Devices used to access the internet 2016 and 2018. (Adults (aged 16+) in Great Britain)

The idea is that it should never be a requirement to tilt the neck up or down.

HOW DO PEOPLE VIEW SCREENS AND DEVICES?

The DO should consider that the eye-to-screen distances for seated and standing may differ. The implications for using larger display screens should also be considered.



Figure 2: A typical workstation set-up (courtesy of www.spineuniverse.com/wellness/body-mechanics/heads-posture-dont-slouch)

The average preferred viewing distance increases as the size of the screen is increased.

When considering multiple monitors, similar rules apply. Viewing distances tend to increase compared to a single monitor –

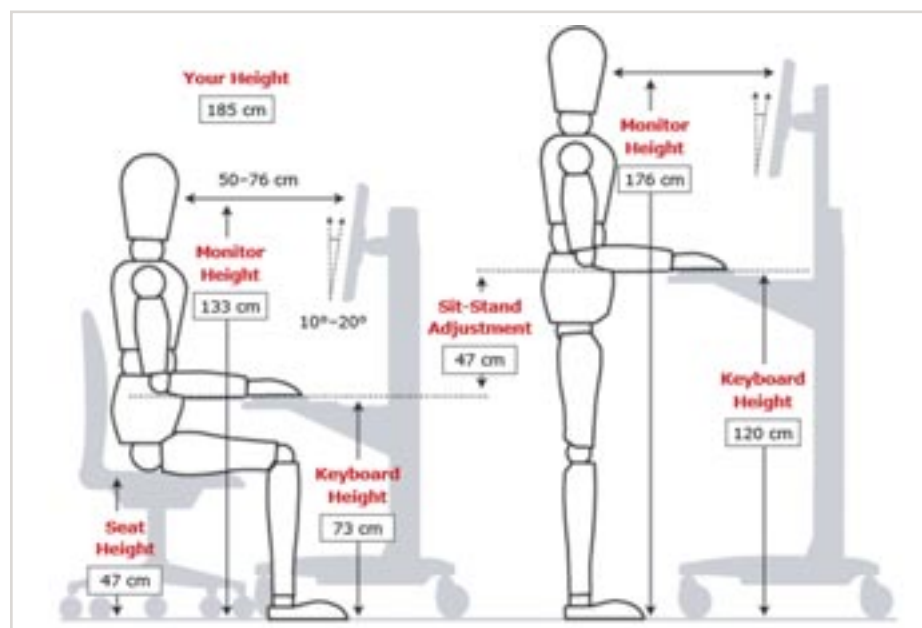


Figure 3: Workstation set-up for a specific user

and it's not just a consideration for the workplace, with many gamers now having multi-screen set-ups.

EVOLUTION OF THE USE OF HAND-HELD DEVICES

Are hand-held devices really an advance? In theory, mobile and hand-held devices should free us from the limited workstations as already seen. The reality though is often very different with users getting themselves into all sorts of positions to use them including seated at a desk, seated without a desk, reclining, standing, and so on.

Ergonomics come much more into play when looking at usage of mobile and hand-held devices. **Table 2** shows the difference in input and output between a tablet, a laptop and a desktop. As the input and display for a tablet are integrated into one unit, the postures and biomechanics are closer to working with pen and paper than with a desktop computer.

Jack Dennerlein, adjunct professor of ergonomics and safety and director of the Occupational Biomechanics and Ergonomics Laboratory at Harvard University, has stated that the advent of tablet computing represented a step backward of sorts: "We've gone back to books, is a way of thinking about it," he said. Unlike with desktop and laptop computers, people are able to use tablets in an almost infinite number of postures. He continues "In theory, that means people ought to auto-adjust their bodies frequently enough to avoid injuring ourselves – after all, nobody ever went to the doctor for paperback thumb or hardcover elbow. Humans are a funny bunch, though, and it seems their inclinations to adopt unhealthy habits are far stickier than humble science could predict."⁴

DEVICE TYPE	INPUT (KEYBOARD/MOUSE) AND OUTPUT (SCREEN)
Tablet computer	Integrated into screen and therefore at same distance
Laptop computer	Separate keyboard/mouse and screen but no ability to change distance between input and output
Desktop computer	Separate keyboard, mouse and screen all of which can be moved independently of each other

Table 2: A comparison of different device set-ups

IMPLICATIONS OF A TOUCHSCREEN

From your smartphone to your car to your computer, and even household appliances, the age of the touchscreen is upon us. Cindy Burt, injury prevention division manager at the UCLA Office of Environment, Health and Safety, has explained the a difference between 'optimal visual distance' and 'optimal reach distance': "We recommend that people have an 18 to 20-inch [46-51cm] envelope in front of them for optimal reaching"; "But for dealing with a monitor, people are recommending arm's length or more, which would be 28 to 32 inches [71-81cm]...The closer the monitor is, the more your eyes have to work to see the screen."⁵

So again, the DO may need to consider a shorter working distance if the user has a touchscreen.

VARYING WORKING DISTANCES

One of the possible advantages of using a combination of a touchscreen, keyboard, and touchpad or mouse is moving between three different inputs and, as a result, changing positions more frequently. As long as it's not awkward in terms of posture, this is a good thing.

Sitting too long in any position is always inviting injury, as bodies simply aren't meant to sit frozen for long periods of time. Muscles and tendons need a break. As Dennerlein⁴ said: "The ideal posture is the next one you're going to take," meaning the shift of position is

everything. If sitting in one position for more than a few minutes, that's too long. "Think about it: even when we sleep, we don't tend to stay in the same posture for a very long time – we roll over and move in our sleep. If you're feeling uncomfortable, listen to your body," he added.

A PAIN IN THE NECK

There tends to be more downward head tilt and eye declination when using a tablet, smartphone or other handheld device. What are the potential implications of this?

Figure 4 shows the stress put on the neck and spine as a result of hunching over a smartphone or tablet. The muscles in the back of the neck are working hard as you are looking down. The more you drop your head, the harder the muscles will have to work. As with any muscles, prolonged and overwork will result in discomfort/pain for the user. This has gained the nickname of 'tech neck' or 'text neck'⁶.

For the example of a 45 degrees head tilt, the almost 50 pounds (23kg) of pressure could be considered to be equivalent to the weight of more than 15 1.5 litre bottles of water – no wonder we get a sore neck.

There are other factors that may affect the posture of the user. For example, two things that drive how people configure themselves when using a device are: visual access and support. Highly reflective glossy

displays are an ergonomic nightmare. They force users to subtly manipulate their body away from a comfortably, neutral position in order to 'fix' their view. A case or stand can allow the user to prop their tablet away from glare so that they can sit in a relaxed position.

TRUST ME, I'M AN OPTICIAN

Let's consider the implications for dispensing when looking at the use of various devices in various situations. The challenge for dispensing is that the user's environment cannot be seen, so careful questioning is key to establishing potential visual requirements.

What might the main considerations be when thinking about finding corrections that help with viewing distances, posture and field of vision? The way in which the device is mounted and used will make a difference to the visual requirements of the patient – or may even require re-educating the patient as to a better way to view the device.

How is the device being used?

- Handheld?
- Seated?
- Standing?
- Reclined?
- In the lap?
- On a stand/in a case?
- Is it angled?
- Is it on a table/desk top?
- Wearable technology, e.g. smartwatch
- Is the patient using multiple devices at different distances?

COMPARATIVE WORKING DISTANCES AND OTHER CONSIDERATIONS

The potential differences in working distances for differing devices will need to be considered:

- PC monitor = 190cm
- Laptop screen (on desk/table) = 63cm
- Tablet (handheld) = 39cm
- Smartphone = 33cm (or less)

So traditionally we have considered the working distance of the patient and their ability to accommodate comfortably, including any visual correction. There tends to be more downward head tilt and eye declination when using a tablet, smartphone or other handheld device.

As a DO, what are the potential implications for dispense of reduced working distance and head tilt/eye declination? Should specialised lenses with an 'add boost' or a longer corridor be considered?

The traditional image of the emerging presbyope, or presbyope in need of a first or increase of near add is the stereotypical, 'I need longer arms', but modern devices have



Figure 4: Stresses on the cervical spine (courtesy of Ken Hansraj)

brought another consideration: what if they tell you that they are comfortably using the device at a 'normal' working distance? Have they achieved this by increasing the font size on their device? This is easily done on smartphones, tablets and e-readers.

PROBING QUESTIONS

Communication through questioning skills and listening skills is a main tool in the toolbox for the DO. There are many different techniques, but one example is the use of 'TED questions'. TED questions begin with Tell, Explain or Describe. Examples of TED questions:

- Tell me more about that
- Explain the situation to me
- Describe that to me

Communication and questioning skills are key and we really need to probe into statements like, "I use an iPad", "I do a lot of screen work", etc. We'd naturally follow up on, "I drive" to see how often, what type of vehicle, in what conditions, how long for and so on. We carry out similar probing when considering use of devices.

The pros of using a TED question includes:

- It provides an invitation to provide lots of information. Potentially, it can provide a 'key' piece of information just using one 'question' that may take several other types of question to find
- The order that someone tells you information can give an indication about how important they currently feel that is to them and their life

The cons of using a TED question include:

- It can provide lots of information. Sometimes the conversation just requires a yes or no commitment
- Depending upon the patient, an invitation to provide such a broad range of answers can be confusing and they don't know where to begin

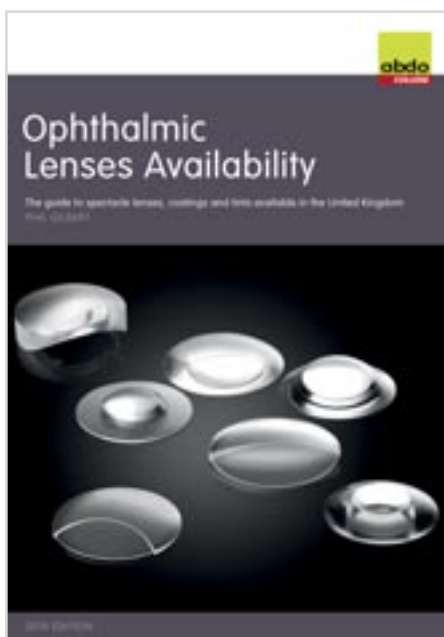


Figure 5: Ophthalmic Lens Availability 2019

POTENTIAL DISPENSING SOLUTIONS

In terms of lenses available, there are many possible solutions. Within *Ophthalmic Lens Availability* (Figure 5) there are tables listing: pre-presbyopia lenses; degressive lenses; and vocational progressives. However, it can be easier to consider the lenses as the following options:

- Lenses for pre and emerging presbyopes
- Occupational lenses – intermediate and near only
- Occupational lenses – indoor/room distance
- 'Normal' progressives
- Other multifocals

Consider the dispensing scenario in Box 1 and think about what may be relevant to the dispense. The author's solution is in Box 2.

OTHER MULTIFOCALS

Consider the scenario where a patient needs

to see screens above head height at an intermediate distance, below their eye line for near vision, and to have clear distance vision? A double-D trifocal could fulfil this. However, there are a selection of lenses from Norville that could work well': Pilotor; Pilotor Double PPL; and Auto-Pilotor.

The Norville Pilotor lens is, in essence, a bifocal segment placed high up in the spectacle frame for intermediate use to read dials and gauges. Inverting a regular bifocal lens blank of any available seg size (usually RD 40), Norville places an Ultor progressive surface onto its lower concave surface.

The Norville Pilotor Double PPL is a double progressive design, with both an up and down progressive surface. This is achieved by inverting a front surface progressive semi-finished blank and forming an inside freeform progressive surface opposite to its usual distance position. This leaves a sufficient wide window for the distance vision portion.

The Norville Auto-Pilotor is the latest in freeform design software technology, which enables the production of an upside-downside double progressive design, both on the same side of the lens, i.e. the inner surface.

SUMMARY

The simple response, "I use a computer/device", may open up a minefield of possible scenarios in terms of type of device, screen size/position, number of screens/devices, desired working distance, input and output on the device and so on. TED (or similar) can be used to drive the detailed responses required to advise our dispensing suggestions.

KEY POINTS

- If you think it will make the patient's life easier/better, recommend it
- Don't hesitate to prescribe the products that best serve your patients' interests
- Will the patient's life improve from purchasing this product?
- Some patients may have already researched lens products – don't be less informed than them

FURTHER RESOURCES

Ophthalmic Lens Availability. For information and orders contact: Justin Hall at the ABDO College Bookshop on +44 1227 733 904. Fax: +44 1227 733 900 or email bookshop@abdocollege.org.uk Hasraj K. Global Results Posture Study. 2015. Video clip available at: <https://www.youtube.com/watch?v=QLHc5U367ps> Accessed 5 April 2019.

Box 1: Scenario

Your patient is a 56-year-old with a low plus prescription. After careful questioning during the dispense, you have established that the patient doesn't like bifocals due to the cosmetic appearance. Her current progressives are a modern personalised design that she finds useful for everyday use and is happy with, however, in the evenings she likes to sit using a tablet or laptop and occasionally looking up to watch anything of interest on the TV.

What lens type would you consider for this specific usage second pair, and why? The TV is at a distance of 2.2 metres.

Box 2: Author's scenario solution

This would be a two pair dispense. The first pair would be to fulfil her everyday usage requirements so again a modern personalised design could be considered for that pair. The 'task specific' pair for use in the evenings would most likely come from the category of indoor/room distance lenses.

The reason behind this choice would be that they provide clear vision out to the distance required as well as offering good intermediate and near vision. There are many options available, a small selection being Essilor Varilux Digitime Room, Hoya Hoyalux iD Workstyle V+ Space and Zeiss Officelens Individual Room.

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