



Welcome

We would like to welcome you to today's General Optical Council Continuing Education and Training (CET) event.

General Optical Council

Learning Objectives:-

Part 1 - Optical magnification and digital magnification

Part 2 - The features and benefits of electronic vision enhancement systems

Part 3 - What else is out there?

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Part 1 - Optical Magnification and Digital Magnification



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Optical Magnification



Optical Magnifiers were originally made using glass, however changes in technology mean that they are now made of premium grade plastics. Cheaper magnifiers often distort around the edges of the lens, this indicates a lower grade of plastic.

Optical magnifiers come in lots of shapes and sizes, however the maximum strength of an optical magnifier is 14x (56 Dioptre). Optical magnifiers gain their power by the thickness of the glass/plastic hence giving a maximum power.

One of the common problems with optical magnifiers is the lens size gets smaller as the magnifier gets more powerful, this is due to the lens needing to be smaller to achieve the thickness. Optical magnifiers come in two main types, stand magnifiers and hand held magnifiers.



Electronic Magnification



Electronic magnifiers come in many forms. The workings of most electronic magnifiers are the same though. Electronic magnifiers have a camera built in to them that looks at the subject that needs magnifying, this camera image then goes through a processor (Simple circuit board). By pressing a button you can increase and decrease magnification, this is done by the processor telling the camera to change the optical zoom. Newer models offer digital zoom also but this often results in poor image quality or pixellation. The processor is capable of a lot of other tricks that enable the user to change brightness, contrast, freeze frame, save, line markers and much more.

Electronic magnifiers can offer over 100x (400 Dioptre) magnification, principally the larger the screen on the magnifier the more magnification it offers. Newer models have output that enable use of an external screens.



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Part 2 - The features and benefits of electronic vision enhancement systems



- Cost
- Posture/Focus
- Enhanced viewing
- Manoeuvre
- Portability
- Magnification
- Hands Free

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Cost



Optical magnifiers have the benefit that the initial outlay for one is cheaper than that of an electronic magnifier, or even free through a low vision clinic.

Over a longer period we believe a basic electronic magnifier actually works out cheaper. Based on a patient with a degenerative condition such as Macular Degeneration we have seen people go through 5-6 different powered magnifiers to accommodate the change in the Macular (remember optical magnifiers are fixed power). Most people with optical magnifiers will also have spares (one for the house, one for the handbag etc).

It's also worth noting hospital issued magnifiers are assessed through near vision reading charts, the inability to adjust magnification means the magnifier might be great for newspaper but not smaller print, this often leads to more magnifiers for different tasks.

Once a patient exceeds 4 optical magnifiers they would have covered the cost of a basic electronic magnifier and normally a lot of hospital waiting times/appointments.

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Posture



The two different types of optical magnifiers available, hand and stand magnifiers are fixed focus, this means the distance between the object and the magnifier, and the eye and the magnifier need to be perfect. This is a little easier with stand magnifiers as they get the distance correct between the magnifier and subject. The result of this is you end up either bending down and arching your back a lot to get the correct distances. Alternatively you can bring the subject and magnifier up-to the eye, this however because somewhat of a balancing act and will eventually give you arm ache.

Electronic magnifiers on the whole, are a better choice for posture. Screens can be angled to save bending, auto-focus cameras mean the distances between the object doesn't need to be so precise and adding extra magnification means you can be further away from the device.



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Enhanced Viewing



Optical magnifiers come with a choice of 3 different lighting options. 2700, 4500, 6500 Lumens. These lights simply illuminated the subject which will make it clearer.

2700 K

4500 K

6500 K

Electronic magnifiers have a much larger array of tools. One of the biggest factors is colour change. This means at the press of a button you can change the colours and backgrounds, this alone sometimes makes a big difference. It's not always a case of one eye condition is suited to one colour either, over many years we have found this is a personal preference. Most electronic magnifiers have a choice of at least 28 combinations. On top of this brightness can be adjusted.



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Manoeuvre



The simple fact of magnifiers - the more magnification that is needed the more you'll need to move it. This is the case for both optical and electronic magnifiers. Electronic magnifiers will show more text than an optical magnifier if the magnification levels being used are the same. The amount will depend on the model and screen size.

Large electronic magnifiers have X/Y tables. These are moveable platforms that move left and right but also up and down. This makes reading more fluent and enable lines of text to be followed easily as the text moves under the camera.

Optical magnifiers do have handles that makes them easy to handle. Electronic magnifiers do also depending on model.



Portability



If we compare optical magnifiers to electronic magnifiers the only comparison we can make on portability is portable electronic magnifiers. Optical magnifiers can have large lenses at lower ends of the magnification scale, making them bulky (1.5x - 10cm lens). More powerful magnifiers 7x and upwards have a maximum 3.5cm lens make them much more portable.

Electronic magnifiers have also got much smaller and lighter with advances in camera technology. They are comparable to a mobile phone in size and weigh 180grams and upwards. It's not unusual for a patient to carry an optical magnifier and have an electronic magnifier for home use.



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Magnification



Optical magnifiers come in a huge array of sizes and powers. The maximum power of an optical magnifier is 14x. Some companies measure the power in magnification, others use Dioptres. The conversion is Dioptres divided by 4 = X Magnification as a good outline. Some magnifiers are rectangle and some are round, as they get stronger only rectangle magnifiers are available.

Electronic magnifiers can magnify to over 100x. Some companies use marketing strategies advertising higher, however an electronic magnifier will become near-on unusable over 70x. This is because you will only see partial words, in this scenario we start looking at text-to-speech machines, this will be quicker and less tiring for the user.

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Hands Free



Electronic magnifiers have a good choice of hands free magnifiers. The advantages of hands free magnifiers is that it makes tasks easier such as writing, hobbies, playing music etc. They can also help if the user has hand tremors or mobility issues.

Optical magnifiers have a much less limited choice. Some companies have made hybrid stands to fit their range of magnifiers that aid writing and hobbies, however this doesn't eliminate movement totally.



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Part 3 - What else is out there?

When magnification gets too large it becomes unusable. This is where text to speech machines come in. Some people mix magnification and speech electronic aids when they are having a bad day or when the eyes get tired. Most text to speech machines can be used by totally blind people also.

The advantages of text-to-speech machines is they are very small, portable and lightweight. They operate by taking a photograph, go through a processor or computer and turn the words in to speech. Text to speech only works on printed text, either physical or digital. Some phone apps are available that offer text to speech, however the user needs to be a competent smart phone user.



Thank You



We'd like to thank you for your time and are happy to answer any questions you may have regarding this General Optical Council Continuing Education and Training (CET) event on objectives we have covered today:-

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