

Multifocals

You have expressed an interest in selecting multifocal lenses and it is important that you are aware of the benefits and limitations of these lenses and ensure your expectations are realistic. This leaflet will go through the various options available. Multifocal lenses are an evolving technology and new lenses are in development all the time. **Your expectations are critical in the success of these lenses** and from the surgeon's view point it is important that your **eye is completely healthy**.

Expectations

A multifocal lens will not return perfect sight at all distances and you may require spectacles to improve distance and / or reading vision however, the aim is to give you spectacle independence for *most* visual tasks. There are several reasons for these limitations.

Accuracy of lens and the distances that will be clear

The first is common to all lens replacement surgery and that is accuracy of determining the lens implant for your eye. The power of the lens is determined by measurements of your eye with some assumptions about where the lens will finally position within the capsular bag. If your eye is very different to the average then errors are more likely and if you have had laser eye surgery in the past the same applies. There is no perfect lens for your eye and even if there were by the time we have accounted for accuracy of lens manufacture and deviations in the measurements and final lens position in the eye it is likely that the effective power of the lens will be different to that predicted. As a result, surgeons tend to aim for a lens that gives good distance vision but err on the side of a 'short-sighted' outcome and this is the same for multifocal lenses. I will show you these measurements and explain this further. The amount of short sight is usually less than the smallest lens your optometrist can make for you so it is fractional. The lens power is determined based on the distance vision outcome even with a multifocal lens.

The near aspect of the multifocal is added to the distance part of the lens and is therefore at a fixed distance. This means that if the distance outcome is excellent then reading will be achieved at some point within arm's length. If

the distance outcome results in a degree of 'short-sight' then the distance vision will not be as good but the reading will be better closer up and may improve your ability to read very small print. Most commonly patients are frustrated that the near correction does not give a full range from close up to arm's length and so it is important to recognise there will be a point of clear focus for near and then a small range either side. Intermediate vision remains very difficult to achieve. I will sometimes use different outcomes for each eye to extend the range of clear vision by making one eye slightly better for near (at the expense of distance vision) and the other eye slightly better for distance (at the expense of near vision but helping intermediate vision). I will also explain these concepts to you. **This next point is very important.** If you are 'short-sighted' you are very used to taking off your spectacles to get fantastic close up vision. If you are very 'short-sighted' you can hold objects very close and see incredibly well. **YOU WILL LOSE THIS ABILITY** with a multifocal lens. 'Short-sighted' people need to think very carefully about multifocal lenses.

If you cope with uncertainty and are relaxed about these limitations but are still keen to try for spectacle independence then you are likely to do well with these lenses. If you need everything to be 'just so' and do not cope well with compromise then these lenses should be avoided. How did you feel reading this?

Sometimes we get an outcome that is unexpected or sub optimal. This may not require any intervention as the brain usually adapts but sometimes the outcome needs adjusting. In this situation, I may place another lens in front of the multifocal in order to adjust the power. There are charges for this extra lens.

Glare, Haloes and other optical aberrations

All multifocal lenses will give some glare, starburst, shadowing or haloes around lights which will be worse at night when the pupil dilates. Sometimes people find artificial light in supermarkets difficult. In the most part, the brain adapts to these added optical effects and 'switches them off'. If you buy a clock that ticks that clock will annoy you for a period of time and then your brain will switch off the tick. This is the same for multifocal lenses. Again, if you are someone who is very introspective and aware of imperfections and sensations throughout your body you may find it difficult to ignore these effects and these lenses may not be for you. As a general rule, it can take up to

three months for these effects to settle and for you to adapt or cope but you need to be prepared for these effects to be permanent.

Eye health and examination

A multifocal lens can only be put into an eye that is free of any other significant 'problems'. Your surgeon will look for any problems and discuss with you but here are a few common issues to consider, this list is not exhaustive. Some would prevent the use of a multifocal but others would require an adjustment in expectations.

Astigmatism (Odd shape of the eye)

It is generally accepted that astigmatism needs to be less than 0.75 Dioptres. If you have greater amounts than this you may need a toric multifocal lens. These are often made specifically for your eye and are more expensive. As part of this assessment the shape of the front part of your eye will be assessed. If your astigmatism is 'irregular' a multifocal is not advised. Surgery can reduce the astigmatism when carefully planned and it is possible to deal with smaller amounts of astigmatism without a toric lens and I will discuss this with you.

Dry Eye

Dry eyes are very common and these can interfere with the performance of any lens placed in the eye including a multifocal. Dry eye would not exclude you from this surgery but you need to be aware of the effect your dry eye may have and be prepared to continue to use frequent artificial tears.

Corneal Problems

The cornea is the clear part at the front of the eye. If there are any significant defects in this part of the eye a multifocal would not be recommended. The most common would be an extension of a normal ageing process which can result in swelling at the front of the eye after surgery.

Advanced cataract

When the cataract is very dense it may be difficult to obtain accurate measurements. Complications of surgery are also more frequent and it is not

generally recommended that a multifocal lens is used. There are certain conditions that effect the stability of the lens and can result in the lens displacing either during or after surgery and multifocals are not recommend in this situation. Occasionally these problems only become apparent at the time of surgery.

Retinal Problems

The most common retinal problem would be macular degeneration and multifocal are not recommended in this situation. There are many other diseases of the retina that would need to be excluded before choosing a multifocal lens.

Optic Nerve

By far the most common problem of the optic nerve is glaucoma. Multifocals are not recommended in patients with glaucoma. Some patients have a lazy eye and although this is not an absolute contraindication vision will be compromised and this needs to be recognised and assessed.

Problems during surgery

Finally, if you have made a good decision and the surgeon is happy to proceed some surgical issues may prevent the use of a multifocal. The most common reason for not placing a multifocal would be problems with the bag of the lens (The capsule). It may rupture during surgery (<2%) or the bag may become unstable due to poor support. If the bag is not a secure place for the new lens a standard distance lens would be placed into the eye. Multifocals need to be well centred and if the support is poor this may not be possible.

An Alternative to Multifocals- Monovision

Another option that you should consider is the option of monovision. In this case a standard lens is placed in your dominant eye aiming for good distance vision. If you are happy with the level of distance vision achieved then a standard lens is placed in your other eye aiming for arm's length reading vision. In this way one eye can see the distance but does not see well close up and the other has some reading although it does not see well in the distance. If you are keen for a degree of multifocality and spectacle independence but do

not like the idea of a multifocal lens this is a very good compromise option at no extra cost.

Multifocals provide an excellent solution to the single focus limitations of standard lenses giving a much higher chance of spectacle independence but they need to be chosen with care and with appropriate expectations. In a recent survey of multifocal lenses from the medical journals several positive and negative characteristics were identified to help select the best patients for multifocal lens implants.

Positive characteristics for patients-Should do well with multifocal

Keen for spectacle independence for most tasks
Easy going with a positive demeanour
Would accept a small compromise in distance vision
Understands there is no guaranteed outcome
Near tasks include mostly reading

Negative characteristics for patients- Multifocals should be avoided

Hypercritical with unrealistic expectations
Sharpest clearest vision is main concern
Heavy dependence on intermediate vision or night vision
'Short-sighted' people who like their uncorrected near vision

Having read through these remember that you do have cataract (we do not perform 'Clear lens Extraction'). Your vision is already compromised and you are likely to require surgery at some point. The only other lenses available are standard single focus lenses and these also come with potential for glare and haloes and inaccuracy. The multifocal should be seen as a way to augment and extend your outcome compared to the standard care which is available on the NHS. Why not complete this questionnaire and bring it with you when we meet or use it to assess your level of suitability?

