Some Special Difficult Cases...

LOW CONES

- Low cones such as in Pellucid Marginal degeneration cause the lens to decenter very low over the highest point in the cornea which is often within 2 mm of the lower limbus.
- To get the lens to ride higher the lens needs to be fitted considerably bigger than normal (often 1.0mm or more) and considerably flatter than normal (up to 0.5mm).
- It also must have good edge lift to allow the lid to pick up the lens and reposition it over the pupil after blinking. If this results in poor comfort or apical staining then a piggyback system should be used.

SMALL STEEP CONES

- Small steep nipple cones often result in pooling around the base of the cone where tears are trapped resulting in poor wearing time.
- To increase tear circulation a fenestration can be used at the edge of the pool.
- Alternatively to reduce this pooling flatten the base, keep the diameter to a minimum and keep the edge lift to a maximum to allow maximum tear flow behind the lens.
- If apical staining results consider using a piggyback system.

ADVANCED CONES

- The epithelium on advanced cones is often more unstable than on early cones. Some minor staining of the cornea may be unavoidable and have to be acceptable in these cases. However regular monitoring of the cornea is very important to avoid scar tissue formation. Keep the lens as small as possible in steep cones to minimize corneal problems.

TORIC CONES/ASTIGMATISM

- If a toric lens is indicated (see above) then fit all the corneal astigmatism outside of the cone so that the edge lift is as regular as possible around the entire circumference of the lens. This will often result in some residual astigmatism, which can be incorporated on the front of the lens.
- This astigmatism is usually 90 degrees away from the flattest axis on the cornea. The most common astigmatism in keratoconus is with the rule (ie minus spectacle cyl axis within 10 degrees of 180) and therefore the residual astigmatism produced is usually within 10 degrees of vertical.
- Ask the lab to always mark the flattest axis on the lens with 2 dots at opposite edges of the lens so lens orientation can be checked on the eye. This flattest axis will read as the greatest minus power under the vertometer.
- Toric lenses because they align so well with the cornea can be fitted a little larger than spherical Rose K lenses producing superior location and vision.
- Keratometry or Corneal mapping are of little value when trying to assess the degree of corneal astigmatism. The only method of accurately gauging this is to place an astigmatic trial lens on the eye. The suggested first toric trial lens should have a toricity of 0.8mm.
- From this fluorescein pattern can be judged whether more or less lens toricity is required.

REFITTING MUCH STEEPER WHERE GOOD FITTING CANNOT BE ATTAINED

- This usually occurs when a patient has been wearing large flat RGP lenses often not a keratoconic design. Often apical staining and scar tissue is present.
- Where the optimum Rose K fit gives poor vision, flatten the Rose K trial lens until satisfactory vision is attained.
- This is often 0.5 or more flatter than optimum fit.
- Keep the diameter larger than a normal Rose K fit.
- Explain to the patient why you are fitting flatter than normal and that you may need to refit them again within 6 months to avoid further damage to the cornea.

Review the fit in 3 months and refit if necessary if apical staining with fluorescein is present.

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Troubleshooting Guide

ROSE K2™ keratoconus lens

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Boston

FITTING TIPS AND PROBLEM SOLVING FOR THE ROSE K2™ KERATOCONUS LENS.

GENERAL GUIDES

- Anaesthetic: Always use a small amount of topical corneal anaesthetic. This reduces tear flow for more accurate fitting assessment.
- Fluorescein: Use small amounts of Fluorescein. Large amounts disguise the best fit.
- Trial Lens: Choose the first trial lens 0.2mm steeper than the average of the two meridians.
- Never fit the lens empirically. A Rose K trial lens must be placed on the eye to assess the best fit and the correct power.
- Apical staining normally indicates a flat fit. Refit steeper. If the staining does not resolve fit even steeper or use a piggyback lens system.
- Always fit the central zone first followed by the secondary zone.
- Central fit: If in doubt about the central fitting pattern it is better initially to fit flatter than steeper and a looser peripheral system than a tighter one.
- For tight eyelids keep the edge lift to a minimum.
- A flat pattern over the cone apex is acceptable as long as there is no apical staining and on blinking the Fluorescein flushes over the cone apex. If it does not the lens is too flat.

DIAMETERS

- For 3 and 9 o'clock staining reduce the diameter and/or increase the edge lift.
- For the low riding lenses increase the diameter by at least 0.3 mm.
- For high riding lenses reduce the diameter by at least 0.3 mm.
- For large palpebral apertures use larger lenses.
- For astigmatic corneas keep the overall diameter to a minimum if using a spherical base to minimize the astigmatic pattern.
- For early cones use larger lenses.
- For advanced cones use smaller lenses.

VISUAL ASSESSMENT

- If a patient reports ghosting or cloudy vision, increase the diameter at least 0.5 mm.
- Always start the refraction with 1.0 diopter steps and refine with 0.5 diopter steps.
- Fine-tune the final refraction over the Rose K lens in a trial frame with the room lights on.
- Auto-refractors are not accurate for keratoconic patients particularly advanced cones.
- Do not be too concerned with the best visual acuity at the initial fitting. This will often improve over the first two weeks as the patient adapts.
- Initially ignore any residual astigmatism. Assess this at the first after care appointment.
- If best acuity is not as good as expected try a flatter base.
- Particularly for advanced cones use large steps initially to assess the power.
- Always finish the refraction over the trial lens in a normally lit room.
- If good vision cannot be attained see final section on Refitting much steeper.

LENS POSITIONING

- Low riding: Increase the diameter, flatten the base, increase the edge lift, or a combination of these.
- High riding. Decrease the diameter, steepen the base, decrease the lift or a combination of these.

ADVANCED CONES

- Heavier than normal apical touch may be necessary in advanced cones to avoid excessive pooling at the cone base and to give good location and vision.
- Often require increased edge lift.
- Use smaller lenses.

EARLY CONES

- Use larger diameter lenses.
- Will require decreased lift more frequently than steeper cones.

ASTIGMATIC CORNEAS

- Cause lenses to ride lower. May need an astigmatic base to attain good central location.
- The larger the lens the more problem the astigmatism will be to the fit if using a spherical base. Keep the overall lens diameter to a minimum if using a spherical base.
- Always try a spherical lens first before using a toric lens.
- If a toric lens needs to be fitted try a toric periphery lens first before fitting a full back surface toric lens. This often produces more stable vision.
- Toric lenses in general need to be a little larger (0.2 to 0.3) than spherical lenses to locate well.

COMFORT

- Increasing the edge lift will often improve the comfort.
- Prescribe lubricating drops particularly during the adaption period.
- Always recommend sunglasses outdoors.
- Always use a separate cleaning solution on lens removal.
- Always use a storage/ conditioning solution with a protein inhibitor if possible (eg: Boston Simplicity).
- Recommend soaking the lenses in a solution once a week to remove protein deposits.
- If lens tolerance is a problem consider using a piggyback system.
- Astigmatic corneas cause discomfort because the lens is tight usually at 3 and 9 o'clock. Use a toric back surface or toric periphery to improve the comfort.
- Polish lenses every 6 months.

PIGGYBACK LENSES

- Use if tolerance to RGP lenses is poor.
- Use if central apical staining cannot be overcome.
- Use if bubbling underneath the lens cannot be overcome.
- Use if the patient is working in a dusty environment.
- Use when the Rose K lens has to be fitted very flat to attain good vision.
- Use when the Rose K lens has to be fitted very flat to attain good centration eg: In Pellucid Marginal Degeneration
- Fit the Rose K lens approximately 0.3 mm flatter and 0.5 mm larger than if the lens was fitted directly onto the cornea.
- Use a low minus soft spherical lens carrier which does not dehydrate easily eg: OSI (biomedics) or Proclear (biocompatibles). Although Silicon Hydrogels give maximum oxygen they are less comfortable and can cause epithelial erosions particularly with post graft corneas.
- The Rose K lens must move freely over the soft carrier. If it binds to the soft lens wearing time will be reduced considerably and corneal oedema will result.
- Excessive apical touch is not a problem. Always fit flatter than normal to ensure good Rose K lens movement. This will also maximize visual acuity.
- Use high molecular fluorescein to gauge the fit between the Rose K lens and the soft lens carrier.

FOLLOW UP EXAMINATIONS

- Patients should be re-examined two weeks after dispensing their lenses.
- Regular routine six-monthly examinations are extremely important for good patient management and long-term successful contact lens wear.
- Lenses should be repolished at least annually and ideally every six months.
- Even if the patient is comfortable in their existing lenses at their routine check but apical staining is present, the lenses should be refitted steeper to avoid long term complications.