## Dr. Paul Rose OD







## Some facts



- Has 4m people and 40m sheep
- Is a 3 hours flight from Australia
- Is an 13 hour direct flight from Vancouver
- Local sport is rugby/ All Blacks
- Home of the "Lord of the Rings"
- Land area is approximately the same as the UK



9 kg Snapper 10/04/10



## **TODAY !!**

- Evolution of the Rose K design
- The Rose K2 fitting system
- Piggybacking
- Rose K2 PG lens for post graft
- Rose K2 IC lens for Irregular Cornea
- Toric periphery and ACT
- Summary of the Rose K2 design?

So why has the Rose K2 KC lens been adopted by so many fitters so today it is the most prescribed GP lens for keratoconus in the world and now fitted in over 80 countries?

> USA alone has 40 + other designs Most labs have their own design 100 + Keratoconic GP designs worldwide

SO WHAT MAKES THIS LENS DIFFERENT??

## SO WHY DID ROSE K EVER HAPPEN?



## **Fitting keratoconus was complicated**

Required high skill levels/ experience
Many different trial sets and designs
Often required fitter to design their own lens
Many (in house) adjustments/not repeatable
Low first fit success rate -3 to 4 lenses per eye
Very time consuming/ not cost effective

## THERE HAD TO BE AN EASIER WAY I

**Fitting made easy** 



## **Fitting made easy**

- The trial set had to be extensive and easy to use.
- The power of the trial lens had to approximate the final lens
- The overall diameter had to be flexible.
- The edge lift had to be flexible to accommodate all cone shapes and easy to use.
- Must have a very simple easy to use fitting system.
- Any RGP fitter could fit Rose K competently.
- Eliminate the need to specify OZ's and SC's
- Had a high first fit success rate
- Could be use across the entire range of the disease ie the design changed as the disease progressed

Computer analysis of my last 350 successful fittings

Analysed for any particular base curve

Overall diameter Optic zone width (seeing part) Secondary curves and widths (fitting part) Power Center thickness Thickest point on lens Axial edge lift Saggital height

## The Optic Zone Decreased as the Base Steepened





Advanced keratoconus



![](_page_15_Picture_0.jpeg)

## Standard GP lens large OZ

## Rose K Small OZ

![](_page_15_Picture_3.jpeg)

#### • SO HOW DOES THIS AFFECT THE FITTING?

![](_page_16_Picture_1.jpeg)

# Small Optic Zone better fit but poorer Vision

Large Optic Zone poorer fit but better vision

## **Rose K** Ease of Fitting

 FIXED OPTIC ZONE SIZE FOR EACH INDIVIDUAL BASE CURVE AND DIAMETER

• VARIABLE OPTIC ZONE OVER THE ENTIRE BASE RANGE

ie Larger for flat bases, Smaller for steeper Bases

![](_page_19_Figure_0.jpeg)

For 8.7mm diameter

**Computer analysis also showed:** 

The Steeper the Base Curve the Greater the Edge Lift

![](_page_21_Picture_1.jpeg)

- Standard 65%
- Increased 20%
- Decreased 10%
- Other lifts 5 to 10%

## Rose K/K2 lens Edge Lift Values

#### **Increased Lift – Flatter Periphery**

![](_page_22_Figure_2.jpeg)

#### Decrease Lift – Steep Periphery

#### **Peripheral System Fitting Pearls**

- Edge Lift Values can be specified in 0.1 increments anywhere from 1.3 Decreased to 3.0 Increased
- Standard Steep = 0.5 Steep
- Standard Flat = 1.0 Flat

## EDGE LIFT

So the amount of flattening across the back surface of the lens was now defined by a single no. (Edge lift) rather than by optic zone diameter and secondary curve radius and widths.

Ideal Edge Lift = fluorescein band width at the edge 0.6 mm to 0.8 mm wide

![](_page_25_Picture_1.jpeg)

#### Judge edge lift in horizontal meridian

![](_page_26_Figure_0.jpeg)

**Base curves in trial set 5.1 to 7.6** 

#### FIRST STEP IN FITTING THE IRREGULAR CORNEA

#### Identifying cone type using a topographer

![](_page_27_Figure_3.jpeg)

Choose the correct design ! 3 RoseK2 lens designs available-

Rose K/K2 keratoconus lens Rose K2 Post Graft lens Rose K2 Irregular Cornea lens

#### **Use Universal Standard Scale**

#### Scale chosen bilaterally by Topographer

![](_page_28_Figure_3.jpeg)

#### Scale 9.38mm to 6.75mm -range 3.63

#### Universal Standard scale for individual map

![](_page_28_Picture_6.jpeg)

#### Scale 11.06mm to 5.86mm - *range 5.20*

## Simple 5 step fitting system extensively supported by fitting guides and lab advice

Order of fitting

a. Central fit
b. Peripheral fit
c. Overall diameter
d. Location
e. Lens movement

Current remake rate in the world under warranty approx 15% ie Approx. 85% first fit success rate

## Step1.Central fit

#### Keratometry guide for first trial Rose K2 keratoconus lens

#### Avg K's 7.1 and flatter –

Choose first trial lens 0.2 mm steeper than the average of the two meridians eg 7.8/7.0 avg = 7.4 First trial lens use 7.2

#### • Avg k's between 6.0 to 7.0 - Use average k's only eg Eg 7.2 /6.4 avg = 6.8 First trial lens =6.8

- First trial lens 0.4 flatter than the average k's eg 6.2/5.2 avg = 5.7 First trial lens = 6.1
- NB This is only a guide as it measures only the central 3mm along the line of sight

![](_page_30_Picture_8.jpeg)

#### • **Topography** (Useful but not essential)

- Use the topographers sim k's of the two primary meridians for the 3mm zone,
- Use the same rules as apply to the keratometer

#### NB This is only a guide :

 For Medmont topographers call up the "Rose K2 designs"

#### Topographers useful for choosing the first trial lens!

![](_page_32_Figure_2.jpeg)

#### **Medmont simulated Rose K image**

#### **Topographers - IN SUMMARY**

- Topographers are relatively accurate for judging the central fit
- Topographers are not very reliable for judging the peripheral fit particularly in larger diameters
- Topographers are not useful in selection of appropriate diameter
- Have no application for power or movement
- Medmont Topographer has Rose K fitting programme

#### Useful to select first trial lens.

## The Rose K2 fitting system

![](_page_34_Picture_2.jpeg)

![](_page_34_Figure_3.jpeg)

![](_page_35_Figure_1.jpeg)

![](_page_35_Picture_2.jpeg)
#### **The Rose K2 fitting system**

•Central fit

#### **Avoid epithelial staining**

#### Leads to scarring and vessels





#### The Rose K2 fitting system



If fluorescein flushes over the steepest point on the cornea on blinking ,corneal epithelial erosion is most unlikely



Note Require 20 microns of fluorescein for fluorescence

### **Tips for Central fit**

- Patient must be looking straight ahead
- Lens must be centralised
- Judge fluorescein pattern directly after the blink
- Ideal if patients head position is natural Burton lamp useful
- Slit lamp essential to judge the final fit
- Blue filter allows better assessment of fluorescein pattern

#### The Rose K2 fitting system

2. Peripheral fit-edge lift system

Always judge edge lift in the horizontal meridian

Tight -go flatter

#### Optimum

Loose- go tighter







#### The Rose K2 fitting system

2. Peripheral fit-edge lift system



#### **Standard Lift Trial lenses**





#### **Excessive lift--Order 0.5 (standard) decreased lift**

## Step2. Peripheral fit-edge lift system



Std Edge lift trial lens showing tight edge **Prescribed lens with Standard increased lift** 

## **Parjaharal fit-adae lift system**

#### Very excessive edge lift Order 1.3 (max) decreased lift



#### **Tight Peripheral fit-order increased lift**

## Parinharal fit-edge lift system

# Very tight : order 3.0 increased lift (flat)

## **EDGE LIFT** (peripheral fit)

Peripheral fit is the singularly most important fitting factor for a successful comfortable GP fit.



### **Ideal Peripheral fit**

## The Rose K2 fitting system Step 3 - Overall diameter

**Std 8.7mm** : Available 7.8 – 10.3mm





## 3. Overall diameter

#### Varies with the Rose K design

The standard trial sets are made in diameters below

Keratoconus std 8.7mm

Post graft - std 10.4mm

#### IC - std 11.4mm







#### **The Rose K2 fitting system**

## Step 4. Location

#### Location mainly controlled by varying diameter and edge lift

#### High



#### Optimum







## 4.Lens Location

#### **Riding High:**

- Tighten the edge lift
- Reduce diameter
- Steepen the base curve

#### **Riding Low:**

- Increase the edge lift
- Increase the diameter
- Flatten the base curve or a combination of these

## Lansubsation



## **Step4. Lens Location** EDGE LIFT





Standard (0) edge lift

0.7 decreased lift

#### **The Rose K2 fitting system**

## **Step 5. Lens movement** Optimum: 1mm to 2mm on blink Movement mainly controlled by edge lift -more EL gives greater movement Must achieve tear exchange



#### 0.5 tighter edge lift



#### 1.0 tighter edge lift





## **BUBBLING**

Make the lens looser by;

- Flattening the base
- Increasing the lift
- Decreasing the diameter (smaller OZ)

or a combination of these

# **Piggybacking is an** extremely effective way of increasing the success of RGP lenses for **Keratoconics**



Piggybacking



Piggybacking

**1.** Get best fit Rose K directly onto the eye

2. Remove Rose K and insert disposable SCL (+0.50)

3. Insert a Rose K lens over disposable SCL 0.3 mm

flatter BC than 1. (or do keratometry over soft lens)

4. Evaluate central fit Rose K with HIGH molecular fluorescein

5. Evaluate peripheral fit. May require more lift

6. Over refract with both RGP and soft lens on the eye

(NB. Soft lens power does not affect final Rose K2 lens power)

7.May require larger (0.5mm )added to diameter

## LOW MOLECULAR FLUORESCEIN CAN BE USED TO OBSERVE GP FIT FOR PIGGYBACKING OVER SOME SIH LENSES





Apply very small amount to back of the GP lens before inserting over Si H lens





•Piggybacking

# **FITTING PROBLEMS?**

- Ø Low location
- Ø Inadequate movement
- Ø Insufficient tear exchange
- Ø Binding
- Ø Anoxia leading to Odema, Vascularisation ,infection
- Ø Mucus under the GP or soft lens
- Ø Softlens fluting (buckling)

#### Should not be a first option unless previous tolerance issues or fitting issues

# MOVEMENT

# Both lenses MUST move independently of each other



- Binding reduces wearing time significantly
- Binding causes corneal anoxia resulting in corneal oedema
- Edge lift choice critical to optimize movement



# Soft lens options

- Menicon PremiO
- Acuvue 1 day Tru Eye
- Acuvue Oasys (8.4) (1)
- Biofinity
- Air Optix Custom. Any BC 7.8/8.0/8.2 14.5mm( ideal for steep cones where buckling occurs )
- Power –low plus
- Purevision & Night and Day

*—fitting only if using low molecular fluorescein* 

#### MODULUS and CO-EFFICIENT OF FRICTION OF MATERIALS

Modulus	Friction
	co-efficient
Night and Day 1.52	<b>49</b>
Purevision 1.06	17
O2Optix 1.2	22
Menicon PremiO 0.90	
Acuvue Oasys 0.72	3
Acuvue Trueye 0.66	
Proclear 0.49	
OSI Biofinity 0.75	
Avaira 0.50	
Acuvue Advanced 0.43	6

•NB The lower the modulus the greater the comfort and the lower the possibility of mechanically induced effects on the cornea and conjunctiva

#### **ROSE K2 POST GRAFT (Rose K2 PG)**

Primary indications post graft, post lasik, post corneal rings
Secondary indications low oval cones




#### **ROSE K2 POST GRAFT (Rose K2 PG)**





- 10.4 mm OD
- Power changing across BC range
- Standard lift



### **ROSE K2 POST GRAFT (Rose K2 PG)**

- Reverse geometry in flatter bases
- Increased reverse geometry as base curve flattens
- Large optic zone (aspheric) covers graft
- OZ decreases as BC steepens
- Steeper peripheral curves than Rose K
- Overall diameter larger than the graft
- Also very useful for ectasia post Lasik









### **EDGE LIFT OPTIONS**



### **Post Graft fitting**



Plus(+4.00) disposable lens very useful for steepening the flat central cornea eg Lasik , PRK

### Post Graft fitting

#### Soft lens evens out highs and lows of cornea



#### **Piggybacking**

- a) Most difficult fittings
- b) Irregular corneal profile
- c) High degrees of astigmatism / often irregular
- d) Raised scar tissue at suture line/often multiple
- e) Sensitivity
- f) Diameter biggest factor in controlling centration

### Post graft fittings

- Irregular corneal profile
- High degrees of astigmatism / often irregular
- Raised scar tissue at suture line/often multiple
- Sensitivity
- Fit invariably a compromise
- Most cases referred for PK can be successfully fitted with contact lenses: Smiddy 1988 -69% / Kastl 1987 – 95% / Fowler 1988- 87% (85% achieved 20/30)

**Grafts much more difficult to fit than keratoconus !** Try all alternative options before referring for graft



## THE ROSEK2 IC <sup>™</sup>



# Fitting the ROSEK2 IC

Indications - When to use ??

<u>PRIMARY</u>

- Pellucid Marginal degeneration- PMD
- Keratoglobus
- Lasik induced ecstasia







# Fitting the ROSEK2 IC <sup>™</sup>

Trial set \_

18 lenses BC - 6.5 (56.25 D) to 8.4 (40.25) 11.0mm overall diameter Changing power to approximate final lens power Standard lift

 Available parameters:
 BC 5.7mm to 9.3mm

 OD 9.4mm to 12mm

 Power – any

 5 Edge lifts : Standard, standard flat, standard steep, \

 double flat, double steep

# Fitting the ROSEK2 IC <sup>™</sup>

For keratometers and topographers

Choose first trial lens 0.3 mm flatter than the steepest corneal meridian

Eg. 6.8/5.5 First trial lens 5.5 +0.3 = 5.8

#### Assess in order :

- 1. central fit and any heavy corneal contact areas
- **2.** peripheral fit- particularly noting tight and loose areas
- 3. diameter should sit approx. 1mm inside the limbus
- 4. location
- 5. movement

## Fitting the ROSEK2 IC <sup>™</sup>

### **Central fit**

OK / steep

Flat

Steep

## Fitting the ROSEK2 IC <sup>™</sup>

### Peripheral fit



Ideal periphery TL std flat

Very tight periphery ( TL std steep EL)

> Tight periphery (TL standard EL)

## Fitting the ROSEK2 IC <sup>™</sup>

**Diameter**- intra limbal (approx. 0.5mm inside limbus) Use minimum OD to achieve centration and comfort





# Fitting the ROSEK2 IC <sup>™</sup>

Location - Tend to locate over steepest point on cornea

**Remedies** 

- Steepen BC
- Increase diameter
- Correct edge lift
- Consider piggybacking



## Fitting the ROSEK2 IC <sup>™</sup>

**Movement** 

Must move sufficiently to achieve tear exchange! ( often less than Rose K2 KC lens : 1mm to 1.5mm)

Increase diameter Steepen BC Reduce the edge lift ( steepen) Insufficient movement Decrease diameter Flatten BC Increase edge lift

### THE NZ EXPERIENCE (Since 1992)

- 350 trial sets in 300 outlets
- Many fitters hold trial sets in different lifts and diameters
- Every practice fits keratoconus.
- Over 3,000 lenses used per annum for a population of 4 M
- Standard of care very high (six month reviews)
- Decreasing number of grafts (penetrating keratoplasty <15%)</li>

### Some facts on Rose K?

- Comprehensive trial set 26 lenses
- Minimum over-refraction over trial lens
- Flexible parameters BC 4.3 to 8.4mm OD 7.9 to 10.4mm
- Comprehensive fitting aids- CD Rom and fitting guides
- Consultant advice available from Blanchard Contact Lenses
- Simple fitting system minimizing chair time
- Easy to fit for fitters with limited GP experience
- Easy control of peripheral fit (edge lift)
- Good first fit success rate. Over 80%

### Some facts on Rose K?

- Ideal for piggybacking
- No need to refer out to experts
- Fits the majority of cone types
- No need to change to a different design as disease progresses
- Available in any toric form FST, PT, BST, bi-toric, ACT (tuck)
- Very cost effective for patient, lab/distributor and fitter
- Proven excellent comfort and vision less corneal insult
- Available worldwide- 83 countries

### Some facts on Rose K?

- Repeatable replacement worldwide
- Proven product over 800,000 Rose K lenses fitted
- Most recognized and fitted GP KC lens in the world
- Awarded "best innovative design award" by the CLMA in 2000
- Awarded "Technology award" 2007 by EFCLIN (Europe)
- Quality materials/ Boston / quality production
- FDA approved
- Patient website www.roseklens.com FITTERS PASSWORD rkprac07
- Practice builder- patient loyalty

### YOUR CHALLENGE !

So why should you ever consider fitting irregular cornea lenses??

PERSONAL SATISFACTION

**MAKING A DIFFERENCE TO THESE PATIENT LIVES AND YOURS** 



#### Cathedral Cove Hahei Coromandel NZ



#### SINCERE THANKS TO

### all of you for attending this lecture today



### **GOOD LUCK with your Irregular cornea fits**