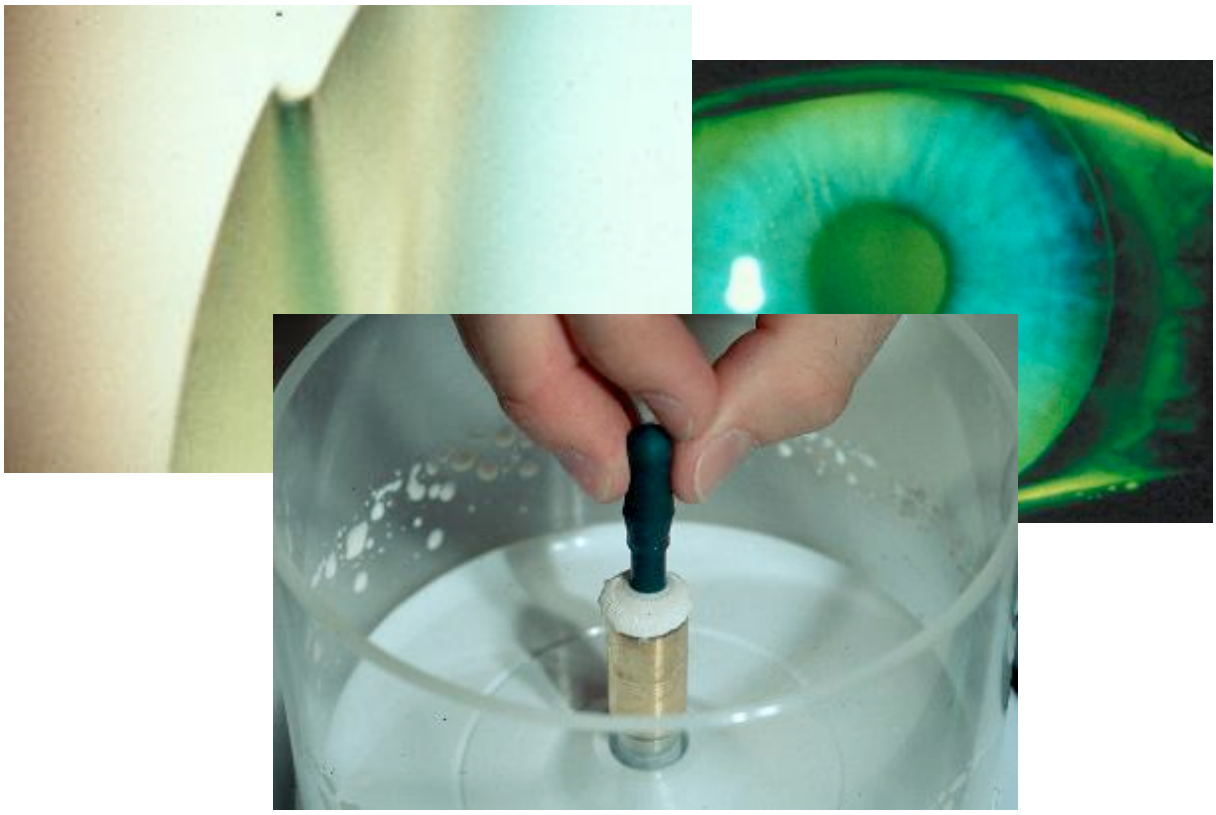
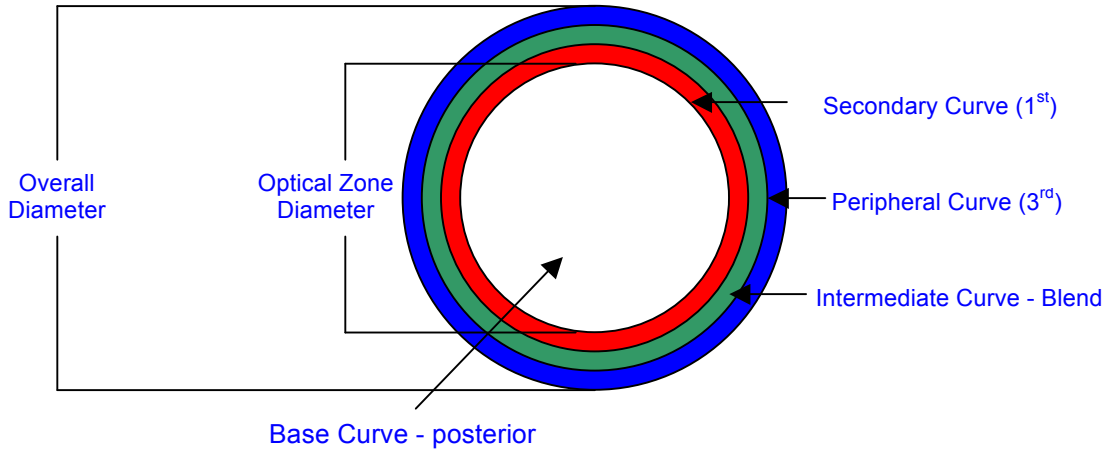
Contact Lens Hands-on Modification Workshop

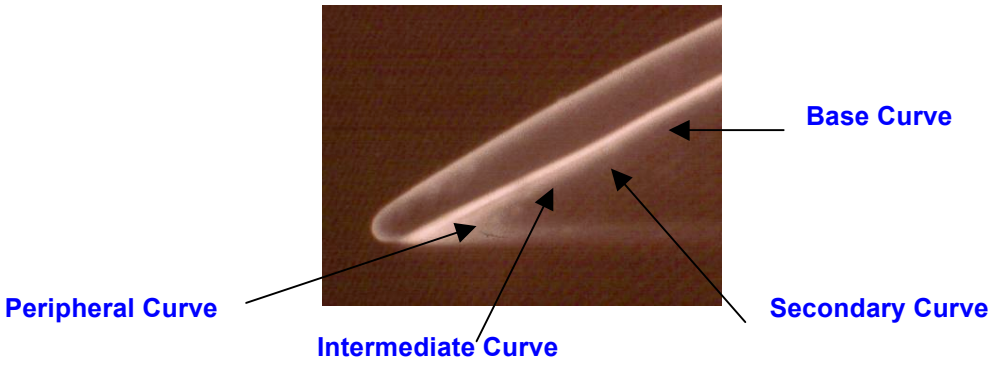


Contact Lens Parameter Terminology and Edge Profile Illustrations

Back Surface Parameters



Peripheral Curve Profile



Edge Profile Comparison

Apex too posterior

Well rounded, ideal shape

Apex too anterior

Contact Lens Hands-on Modification Workshop

Objectives

To demonstrate easy, quick techniques to evaluate and modify GP contact lenses to improve patient comfort.

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GP(Oxygen Permeable) Lens Modification and Verification to Improve Fit and Comfort

Historical Review of GP Contact Lenses

PMMA (the old hard lens material) has been around for years. Gas Permeable lenses have been in production since the early 1980's.

First Generation GP's	Second Generation GP's	Third Generation GP's
• Boston II	• Boston IV	• Boston EO, ES,
• Paraperm O2	• Paraperm O2+	• HDS, P-Thin
• Optacryl 60	• Optacryl K	• FP 30,60,90,151
• SGP	• SGP II, III	• FX 300, 500,700
• Polycon I	• Polycon II	

Today, we have available the Fourth generation of GP lens materials, which are innovative in offering better wetting characteristics with moderate to high DK. These include:

- Optimum Classic, Comfort, Extra, and Extreme
- ONSI-56
- Hydro 2
- Menicon Z

The trend is that with each new product introduction there is an improvement in regards to surface wettability, oxygen permeability, comfort and overall better cornea health. However, in the past, some of the Third Generation materials may be a more difficult to manufacture and modify. This is not the case with the newer Fourth Generation which machine very well.

Easy Modifications to Enhance Patient Comfort

The first step in evaluating comfort is to ask the patient; "Are you aware of the lens upon initial insertion or do you become more aware of the lenses the longer that you wear them?"

If there is initial awareness, the problem is most likely the lens edge. The edge may be too thick, too thin, or has a lip either towards the front or back.

If the awareness occurs after 2-3 hours and progressively worsens throughout the wearing time, the problem is most likely a tight fit or peripheral curve/blending problem.

Observe the lens on the eye before modifying. The lens should move slightly up on the blink and then center well. An on-eye evaluation chart is attached for your convenience.

GP Contact Lens On-eye Observation Evaluation Reference Guide

Problem	Probable Cause	Suggested Modification
• Initial pain upon insertion	• Lip on the edge • Lens damage	• Fingerlish or roll edge
• Tight, dry feeling – getting worse as the day goes on	• Tight fit – not enough blend in the periphery	• Open PC's slightly • Re-blend periphery
• Loss of vision • Lens filmy • Loss of wearing time comfort	• Numerous scratches on front or back surface • Dirt, or lens improperly cleaned	• Clean lens well • Lightly polish surface and retouch blends
• Lens rides high under upper lid	• Pull lid away from lens • If lens drops and centers, lens edge is probably too thick	• Re-CN to thin edge and taper more • Fingerlish or roll edge • Reduce diameter and OZ
• Lens rides low being forced down by upper lid • Lens not being picked up during blink	• Lens edge possibly too thick • Lens too steep or too flat	• Re-CN to thin edge slightly • Open PC's slightly • Possibly need to refit
• Itching, fogging, inconsistent vision	• Solution related or cleaning/non-compliance • Possible soap or lotion contamination. • Cleaner residue not properly rinsed.	• Observe patient's cleaning regimen • Ensure that proper soaps are being used • Re-instruct care routine • Massage conditioner on lens surfaces before insertion
• Anything strange	• Observe blinking, lens movement, positioning after blink and wide open stare • Note lid positions at normal gaze and their relationship to the pupil	• Record your findings • Call your lab consultant – they will be happy to try to help

HANDS-ON MODIFICATION INSTRUCTIONS

It is impossible to cover all of the problems and suggestions in just one session. The following instructions will cover the four most common modifications that are practical for you to perform in the office:

- Fingerlishing
- Re-CN of the front surface edge
- Re-blending the posterior periphery
- Polishing of the front or back surfaces

FINGERLISHING: smoothing of the very edge of the lens. The procedure is to place the lens with the BASE CURVE SIDE UP in the fingerlish tool using your fingers and polish to buff the edge.

Re-CNing of the front surface edge: Placing new CN bevel on the front surface edge contour. The procedure is to use a 90° CN tool or velveteen drum tool to thin and taper the front surface edge.

Re-blending the periphery: smoothing, polishing and re-blending the posterior peripheral curves. The procedure is to use clean, wet polish and padded radius tools to smooth, polish, blend or change the periphery design.

Re-blending the Peripheral Curve
Tool Selection Example

Base Curve: 42.12D (8.00mm)

BLENDING TOOLS TO BE USED
Secondary: 9.00mm
Blend: 10.50mm
Peripheral Curve: 12.00mm
Note: *No blend tool less than 1.00mm flatter than the base curve should ever be used*

Polishing Front and Back Surfaces: lightly polishing burrs left from scratches.

The procedure for FRONT SURFACE POLISHING is to use a spinner stick, velveteen drum tool, and wet polish. Lightly polish the surface with a minimal amount of pressure.

For BASE CURVE POLISHING use a very wet cone sponge tool, applying generous amounts of polish. Lightly buff the base curve surface working from the center to the edge at a 45° angle.

CAUTION!! Base curve polishing usually does more harm than good and should only be used as the last resort to remove deposit buildup from the base curve surface. This polishing procedure is the most abused due to its simplicity and being accepted by many as a cure-all. Keep in mind that *MOST POLISHING IS OVERDONE.*

Tips:

- Incorrect, excessive polishing can (and will) alter the edge contour, base curve, and the peripheral and blend curves. It may also distort optics and inadvertently change the lens power.
- It is imperative that you completely evaluate all of the lens parameters prior to performing any modification. All lens parameters are directly linked to one or more other parameters. Therefore, any change in one lens parameter will automatically impact another.
- HEAT is the rigid lens surface's worst enemy. Never subjecting a lens to a heat-building condition will reduce the error factor when modifying lenses significantly. Excessive motor/tool speed, excessive pressure, too little or too much polish and too small amount of water can all lead to excessive heat.
- When using single speed adjusting units, keep in mind that there is more speed/force at the outside of the adjusting tool than in the center. Staying close to the center will reduce this speed/force, thereby lowering the amount of heat generated.

Patient Information - Blinking and GP Lens Wear

Did you know that many people with visual problems develop incorrect blinking habits? As a contact lens wearer, correct blinking is especially important to you.

If you blink partially or incorrectly, the area of your cornea not covered by the contact lens can become dry. Your eyes may feel itchy, tired or heavy.

Sometimes, the drying makes contact lens wear difficult, right from the start. But usually, the effects of drying don't develop until after months or years of lens wear. If the dryness becomes severe enough, wearing contact lenses may be no longer possible.

Blinking correctly can maximize your ability to wear contact lenses comfortably for many years to come.

Experts in the contact field such as Dr. Ian Mackie, Dr. Donald Korb, Dr. Charles Stewart and Dr. C. Edward Williams have developed blinking exercises. These exercises are designed to eliminate improper blinking by substituting a natural fluid movement that uses your eye muscles correctly.

Steps to Developing Correct Blinking Habits

Relax. To relax your eye, you must relax your whole body. Keeping your head straight and erect, place your fingertips at the corner of your eyelids and focus your eyes straight ahead. Don't concentrate on looking ahead when your eyes are closed. That will tend to force unnatural eye movements that can cause muscle tension.

Close. In a gentle, smooth motion, close your lids. If you feel tension through your fingertips try closing your eyes in "slow motion", as if you're falling off to sleep. As your eyes close, don't let them turn downward, rather let them drift up as the lid moves downward to close.

Pause. With your eyes closed, pause for the count of three. Feel the sensation of complete closure of your eyes. If you're doing the exercise properly, the muscles will relax and allow the eye to drift upward as in sleep.

Open. Slowly, open your eyes SLIGHTLY wider than usual. Just slightly, without forcing the muscles or wrinkling your brow.

Pause. With your eyes wide open, pause for a count of two.

Repeat. Do the exercise again in this rhythm; close, pause, pause, pause; open, pause, pause, pause; close, pause, pause, pause; open, pause, pause, pause; etc.

Practice. Performing this exercise 15 times daily, with 10 correct blinks each (or as your eyecare practitioner advises) will help you to learn to blink correctly. Three to eight weeks of correct practice should improve your blinking habits significantly.

NOTE: *Some new contact lens wearers may experience blurred vision with a full correct blink. This occurs when excess tears move over the contact lens surface. There may be a temptation to inhibit blinking or to blink partially to overcome this effect. Advise your eyecare practitioner if this happens to you*.

GP Lens Material Selection Chart

Contamac US Inc.

NAME	MATERIAL TYPE	DK*	COLORS (Non-UV)	COLORS (UV)
Optimum Classic	Fluoro-silicate Acrylic	26	None	Blue, Green, Grey
Optimum Comfort	Fluoro-Silicate Acrylic	65	None	Blue, Green, Grey
Optimum Extra	Fluoro-Silicate Acrylic	100	None	Blue, Green, Grey
Optimum Extreme	Fluoro-Silicate Acrylic	125	None	Blue, Green, Grey
Hybrid FS	Fluoro-Silicate Acrylic	30	Blue	None

* Revised Fatt/ISO method

LAGADO CORPORATION

NAME	MATERIAL TYPE	DK*	COLORS (Non-UV)	COLORS (UV)
SA 18	Silicone Acrylate	18**	Clear, Medium and	UV on Request
SA 32	Silicone Acrylate	32**	Dark Shades of Blue, Green,	(All Materials)
Flosi	Fluorosilicone Acrylate	26*	Brown, Grey, Violet	
ONSI-56	Silicone Hydorgel GP	56*	(All materials All Colors above)	
Menicon Z	Fluorosilicone Acrylate	160	Blue	

* Revised Fatt method, ** Fatt method

INNOVISION INC.

NAME	MATERIAL TYPE	DK*	COLORS (Non-UV)	COLORS (UV)
AccuCon	Fluorosilicone Acrylate	25	Clear, Blue, Brown, Gray, Green, Dark Blue	

*Fatt method

PARAGON VISION SCIENCES

NAME	MATERIAL TYPE	DK*	COLORS (Non-UV)	COLORS (UV)
Paragon HDS®	Fluorosilicone Acrylate	58*	Blue, crystal blue, green, forest green	Blue, crystal blue, green
Paragon Thin™	Fluorosilicone Acrylate	29*	Sapphire blue, emerald green, clear	Sapphire blue, emerald green
FluoroPerm® 30	Fluorosilicone Acrylate	30*	Blue, gray, green, clear, crystal blue, majestic blue	Blue, gray, green
FluoroPerm 60	Fluorosilicone Acrylate	60*	Blue, green, clear, brown & crystal blue	Green, blue
FluoroPerm 92	Fluorosilicone Acrylate	92*	Blue, green, clear	Blue, green
FluoroPerm 151	Fluorosilicone Acrylate	151*	Blue, crystal blue	Blue
Paraperm® 02	Silicone Acrylate	15.6**	Blue, clear, green, electric blue, cool green	
Paraperm EW	Silicone Acrylate	56**	Blue, clear, green	
Optacryl® 60	Silicone Acrylate	18**	Blue, green, gray	

* Revised Fatt method, ** Fatt method

PERMEABLE TECHNOLOGIES, INC.

NAME	MATERIAL TYPE	DK*	COLORS (Non-UV)	COLORS (UV)
SGP 3	Fluoro-Siloxane Acrylate	43.5	Blue, Green, Clear	
SGP II	Siloxane Acrylate	43.5	Blue, Green, Clear, Grey, Brown	
SGP	Siloxane Acrylate	22	Blue, Green, Clear, Grey, Brown	

* CLMA Standard Method

POLYMER TECHNOLOGY

NAME	MATERIAL TYPE	DK*	COLORS (Non-UV)	COLORS (UV)
BOSTON® EO	Fluorosilicone Acrylate	82	Blue	Blue, Ice Blue, Green, Gray, Brown
BOSTON ES®	Fluorosilicone Acrylate	31	Blue	Blue, Ice Blue, Green, Gray, Brown
BOSTON® EQUALENS®	Fluorosilicone Acrylate	64		Blue
BOSTON® IV	Silicone Acrylate	26	Clear, Blue, Electric Blue	
BOSTON® II	Silicone Acrylate	14	Clear, Blue, Green	

* Gas to Gas method

American National Standard Institute (ANSI)

Contact Lens Tolerances

	Power	Tolerance
Sphere Power	0 to 5.00D	+/- 0.12D
	5.12 to 10.00D	+/- 0.18D
	10.12 to 15.00D	+/- 0.25D
	15.12 to 20.00D	+/- 0.50D

	Power	Tolerance
Cylinder Power	0 to 2.00D	+/- 0.25D
	2.12 to 4.00D	+/- 0.37D
	Over 4.00D	+/- 0.50D

	Power	Tolerance
Cylinder Axis	0.50D - 1.50D	+/- 8 degrees
	Above 1.50D	+/- 5 degrees

	Parameter	Tolerance
	Toric base curve	+/- 0.05mm
	dd r o to 0.20	+/- 0.05mm
Base Curve	dd r 0.21 to 0.40	+/- 0.06mm
	dd r 0.41 to 0.60	+/- 0.07mm
	dd r more than 0.60mm	+/- 0.09mm

	Parameter	Tolerance
	Diameter	+/- 0.05D
Lens Parameters	Optic Zone	+/- 0.20D
	Center Thickness	+/- 0.02D

	Parameter	Tolerance
Bifocal Refractive	Add power	+/- 0.25D
	Seg height	+/- 0.10mm

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