Table 3. Investigational Model vs. Historical Model Specific Cumulative and Persistent Adverse Events One Year

	Posterior Chamber Historical Control[A]		Center*flex* IOL		C-*flex*® IOL		Pooled Center*flex* and C-*flex*® data	
	N	%	n/N	%	n/N	%	n/N	%
Cumulative[B] Hyphema	91	2.2	0/182	0.0	0/301	0.0	0/483	0.0
Cumulative Macular Edema	124	2.9	5/182	2.7	6/301	2.0	11/483	2.3
Cumulative Retinal Detachment	11	0.3	0/182	0.0	0/301	0.0	0/483	0.0
Cumulative Pupillary Block	5	0.1	0/182	0.0	1/301	0.3	1/483	0.2
Cumulative Lens Dislocation	5	0.1	0/182	0.0	0/301	0.0	0/483	0.0
Cumulative Endophthalmitis	4	0.1	0/182	0.0	0/301	0.0	0/483	0.0
Cumulative Hypopyon	16	0.3	0/182	0.0	0/301	0.0	0/483	0.0
Cumulative Surgical Reintervention	46	0.8	0/182	0.0	3/301	1.0	3/483	0.6
Persistent[C] Macular Edema	19	0.5	3/166	1.8	2/284	0.7	5/450	1.1
Persistent Corneal Edema	11	0.3	1/166	0.6	1/284	0.4	2/450	0.4
Persistent Iritis	11	0.3	0/166	0.0	0/284	0.0	0/450	0.0
Persistent Raised IOP Requiring Treatment	17	0.4	0/166	0.0	0/284	0.0	0/450	0.0

Notes:

[A] Annex B – FDA grid of historical controls: BCVA at one year, FDA Intraocular Lens Guidelines, 1999.

[B] Cumulative Adverse Event (AE) for the investigational model IOL is computed as any occurrence up to and including the current interval. Historical control cumulative values are up to and including 1 year.

[C] Persistent Adverse Event (AE) for the investigational model is defined as an AE remaining unresolved at the start of the current evaluation interval.

Table 3(a). Surgical Reintervention Table

Time period of occurrence	Lens	Rate of occurrence	Description and reason
1-2 days	C-*flex*®	0.3%	"Pupillary block" due to residual viscoelastic after cataract surgery.
1-2 months	C-*flex*®	0.3%	Reduction of visual symptoms by correcting astigmatism using "limbal relaxing incisions (LRI)".
4-6 months	C-*flex*®	0.4%	"Refraction disorder": Post-operative corrected vision of the left eye was 20/20 and the refractive correction was as planned -2.00. However, the patient was no longer satisfied with the "monovision" status, and wanted better depth perception for a sporting activity. After many discussions with the patient, it was decided to opt for changing the refractive status of the left eye to Plano. A second implant was subsequently implanted on top of the study IOL to correct the myopia.
2 years	Center*flex*	0.7%	"Corneal transplant": The patient underwent uneventful phacoemulsification and IOL implantation. The patient developed epidemic keratoconjunctivitis. Slit-lamp examination revealed a corneal edema and endothelitis. In the course of 18 months, corneal endothelial cell decompensation led to persisting edema followed by bullous keratopathy, corneal opacification and scarring. Corneal transplant surgery was subsequently successfully performed.

As of December 21st, 2005, there were 492 implants and the overall incidence of reported adverse events was 7.11%.

The complications experienced during the clinical trial of the C-*flex*® and Center*flex* lenses include (in order of frequency): Cumulative Macular Edema 2.3%, Persistent Macular Edema 1.1%, Vision blurred: 0.8%, Halo vision: 0.6%, Cumulative Surgical Reintervention 0.6%, Persistent Corneal Edema 0.4%, Eye pain: 0.4%, Cumulative Pupillary Block 0.2%, Fibrin deposition on the lens: 0.2%, Visual disturbance: 0.2%, Iritis: 0.2% and Cataract operation complication: 0.2%

Other potential complications of cataract or implant surgery include, but are not limited to the following: Endophthalmitis, retinal detachment, cyclitic membrane, iris prolapse, hypopyon, corneal edema, corneal endothelial damage, uveitis, hyphema, lens epithelial cell on-growth, secondary glaucoma and precipitates on the lens surface. Secondary surgical intervention may be required for, but is not limited to the following: Vitreous aspirations or iridectomy for pupiliary block, wound leak repair, retinal detachment repair, lens repositioning, and lens replacement due to refractive error or severe inflammation.

Patient satisfaction

A modification of the patient satisfaction questionnaire used by Tester, Pace, Samore and Olson (2000)[8] to assess patient reports of dysphotopsia and patient satisfaction with the investigational implant was added to the clinical follow-up assessments for patients implanted with the C-*flex*® IOL. The design of the Center*flex* study Protocol did not include these assessments.

For this questionnaire, patients are asked to rate the severity of symptoms present in their operative eye and fellow eye. Preliminary analyzes revealed substantial differences in results between patients for which their fellow eye had a prior implant. These prior implants were not investigational devices and were present prior to enrollment into this study.

Satisfaction with corrected eye vision was larger for the operative eye compared to the fellow eye, a finding driven mostly by the subset of patients with no fellow eye implant. Overall satisfaction was approximately 90%. These results indicate overall patient satisfaction with the investigational device.

Nd-YAG rates

The neodymium:yttrium-aluminum-garnet (Nd-YAG) rates for the Center*flex* and C-*flex*® IOLs are presented in the following table.

In Rayner IOLs, ray-tracing studies show no general increase in glare as a result of the Enhanced Square Edge Technology.

Table 4. Nd-YAG rates

IOL model	No. of clinical sites	No. of IOLs implanted	No. of YAG procedures 12 months post-op	YAG % per overall patient no for IOL model ≤ 12-month post op	No. of YAG procedures 24 months post-op	YAG % per overall patient no for IOL model ≤ 24-month post op
Center*flex*	2	182	4	2.19%	24	13.18%
C-*flex*®	7	301	9	2.99%	16	5.31%

How supplied

Rayner 600C lens is supplied in a 0.9% saline solution in a blister pack terminally sterilized with moist heat and should only be opened under aseptic conditions.

Expiration date

The expiration date on the lens package is the sterility expiration date. Do not use the IOL after the expiration date.

Returns policy

Contact the Rayner U.S. Distribution Center (Tel: 866-961-1811, Fax: 866-956-5029) regarding the returned goods policy.

Return the lens, with full identification and reason for the return to Rayner U.S. Distribution Center, Metro Park Warehouses, Inc., 6901 Stillwell, Kansas City MO 64120, United States. Label the return package as a biohazard.

Bibliography

1. Schmidbauer, Josef M. M.D.; Vargas, Luis G. M.D.; Peng, Qun M.D.; Escobar-Gomez, Marcela M.D.; Werner, Liliana M.D., Ph.D.; Arthur, Stella N. M.D.; Apple, David J. M.D. International Ophthalmology Clinics. 41(3):109-131, Summer 2001.
2. Arthur S.N., Peng Q., Apple D.J., et al. Effect of heparin surface modification in reducing silicone oil adherence to various intraocular lenses. Journal of Cataract & Refractive Surgery. October 2001, Vol 27 No. 10 pp 1662-1669.
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4. DJ Apple, JL Federman, TJ Krolicki, et al. Irreversible silicone oil adhesion to silicone intraocular lenses. A clinicopathologic analysis. Ophthalmology, June 1996, Vol 103, 1555- 1561.
5. David J Apple, MD, Robert T. Isaacs, MD, David G. Kent, FRACO, et al. Silicone oil adhesion to intraocular lenses: An experimental study comparing various biomaterials. Journal of Cataract & Refractive Surgery. May 1997, Vol 23, pp 536-544.
6. Boettner, E.A. and Wolter, J.R., "Transmission of the Ocular Media," Investigative Ophthalmology, 1:776-783, 1962.
7. FDA Intraocular Lens Guidelines, 1999.
8. Tester R, Pace NL, Samore M, Olson RJ. Dysphotopsia in phakic and pseudophakic patients: Incidence and relation to intraocular lens type. J Cataract Refract

Prescription Device

FEDERAL U.S. LAW RESTRICTS THIS DEVICE TO SALE BY, OR ON THE ORDER OF A PHYSICIAN.

600C IOL

600C Hydrophilic acrylic injectable IOL

Rayner

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600C Aspheric IFU PF000115 Version 02 Issue Date 22 August 2018

Device description

The Rayner C-*flex*® intraocular lenses and the 600C intraocular lens (IOL) are single piece ultraviolet-absorbing posterior chamber intraocular lenses for the treatment of aphakia. The 570C is the C-*flex*® parent model; the 600C is 6 mm Aspheric model. The anterior surface of the 600C Aspheric is modified to have a radially symmetric conic form, designed to reduce spherical aberrations.

The C-*flex*® and the 600C IOLs are designed to be surgically implanted into the capsular bag of the human eye as a replacement for the crystalline lens following phacoemulsification, with an anterior continuous curvilinear capsulorhexis just covering 360° of the anterior edge of the IOL optic by 0.5 to 1.0 mm[1].

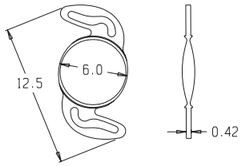
The hydrophilic nature of the Ray*acryl*® material and the design features of the Rayner C-*flex*® and the 600C lenses reduce the problems of silicone oil adhesion and silicone oil induced opacification.[2-5]

The 600C IOL model is available from +8.0 to +30.0 Diopters with 0.5 Diopter steps, and from +31.0 to +34.0 Diopters with 1.0 Diopter steps.

IOL material (Ray*acryl*®) characteristics

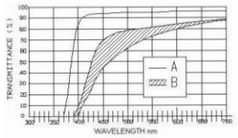
- Ray*acryl*® (2-hydroxyethyl methacrylate/methyl methacrylate copolymer)
- Water content = 25.5% in equilibrium
- Refractive index = 1.46
- Tear strength = 3 MPa
- UV light transmission 10% cut-off = 374nm, see Figure 2
- Nd:YAG laser compatible

600C dimensions (Fig. 1)



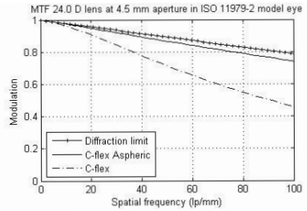
All dimensions in mm

Spectral transmittance (Fig. 2)



A C-*flex*® intraocular lenses
B Human crystalline lens aged 4 - 54 years (Boettner and Wolter, 1962)[6]

Modulation transfer function (Fig.3)



All IOL measurements were made at a 4.5 mm aperture and in accordance with the ISO 11979-2:2000 standard model eye.

Indications

Rayner C-*flex*® and 600C intraocular lenses are indicated for primary implantation for the visual correction of aphakia in adults in whom a cataractous lens has been removed by phacoemulsification. The lens is intended to be placed in the capsular bag.

Contraindications

Apart from non-specific contraindications related to any form of ocular surgery, the following specific contraindications must be respected.

1. Microphthalmia
2. Active ocular disease (e.g. chronic severe uveitis, proliferative diabetic retinopathy, chronic glaucoma not responsive to medication)
3. Children under the age of 21 years.
4. Corneal decompensation or corneal endothelial cell insufficiency.
5. Persons who are pregnant or nursing.

Warnings

A risk/benefit ratio must be assessed before confirming a patient as a candidate for the Rayner C-*flex*® and 600C IOL implantation, if they are suffering from any of the following conditions:

1. Recurrent ocular disease (e.g. uveitis, diabetic retinopathy, glaucoma, corneal decompensation)
2. Previous ocular surgery
3. Non-age-related cataract
4. Vitreous loss
5. Iris atrophy
6. Severe Aniseikonia
7. Ocular Hemorrhage
8. Macular degeneration
9. Zonular dehiscence
10. Ruptured posterior capsule
11. Patients in whom the intraocular lens may affect the ability to observe, diagnose, or treat posterior segment diseases.
12. Surgical difficulties at the time of cataract extraction which might increase the potential for complications (e.g. persistent bleeding, significant iris damage, uncontrolled positive pressure, or significant vitreous prolapse or loss)
13. A distorted eye due to previous trauma or developmental defect in which appropriate support of the IOL is not possible.
14. Circumstances that would result in damage to the endothelium during implantation.
15. Suspected microbial infection.
16. Children under the age of 2 years are not suitable candidates for intraocular lenses

Since the Rayner 570C C-*flex*® IOL clinical study was conducted with lens implantations into the capsular bag only, there is insufficient data to demonstrate the safety and efficacy for ciliary sulcus placement of the 570C or 600C IOLs.

Precautions

1. The unopened pack must be stored in dry conditions between 32°F and 113°F.
2. Do not use the IOL after the expiration date.
3. Check the integrity of the sterile packaging before use. Do not use the lens if the packaging is damaged.
4. Rayner IOLs are for single use only. Do not resterilize by any method.
5. Do not soak or rinse the intraocular lens with any solution other than sterile balanced salt solution or sterile normal saline.
6. Prior to placement into the eye do not allow the IOL to contact substances that are unsterile and consequently ocular-incompatible.

Directions for use

1. Prior to implanting, examine the lens label on the unopened inner package for model, type, power, proper configuration and expiration date.
2. Non-toothed, polished instruments must be used when handling the IOL.
3. To remove the lens, carefully open the peel pouch and blister tray in a sterile environment. When removing the lens from the blister tray, do not grasp the optical area with forceps. Prior to the actual folding or injection process, the lens should be handled by the haptics only.
4. Examine the lens thoroughly to ensure particles have not become attached to it, and examine the lens optical surfaces for other defects. Discard the lens if any defects are observed.
5. The lens may be soaked in sterile balanced salt solution until ready for implantation.
6. Rayner recommends that saline is not used as the sole lubricating agent, but in combination with a viscoelastic solution. The use of a sodium hyaluronate-based viscoelastic is recommended.
7. The 600C Aspheric IOL is approved for use with Rayner STW01, RSP01 injector systems, and Medicel VISCOJECT™ 1.8 (LP604350 Rev 2) injector system listed under K070669. Or other injector systems that specifically identify the 600C Aspheric IOL in their cleared labelling. Please refer to the Directions For Use of the insertion instrument for additional information.
8. Load the lens into the injector immediately after removal from the blister pack and insert into the eye within 3 minutes of loading.
9. Irrigate/aspirate to eliminate any OVD residues from the bag, especially between the IOL and posterior capsule.
10. The anterior continuous curvilinear capsulorrhexis should be 360° and just cover the anterior edge of the IOL optic by 0.5 to 1.0 mm.[1]

Patient registration and reporting

A Patient Identification Card is included in the package. This is to be completed and given to the patient, together with instructions to keep the card as a permanent record to be shown to any eye practitioner the patient consults in future.

Self-adhesive lens identification labels are provided for use on the Patient Identification Card, Implant Tracking Card and other clinical records.

Adverse events/complaints that may reasonably be regarded as lens-related and that were not previously expected in nature, severity, or degree of incidence, should be reported to Rayner Intraocular Lenses Limited, The Ridley Innovation Centre, 10 Dominion Way, Worthing, West Sussex, BN14 8AQ, United Kingdom. Tel. +44 (0) 1903 258900, Fax. +44 (0) 1903 258901, Email: feedback@rayner.com through the Rayner U.S. Distribution Center, Metro Park Warehouses, Inc., 6901 Stillwell, Kansas City, MO 64120, United States. Tel: 866-961-1811, Fax: 866-956-5029.

Power calculations

The surgeon should preoperatively determine the power of the lens to be implanted.

This can be calculated variously from the corneal radius, the depth of the anterior chamber and the axial length of the eye according to formulae described in the following references:

1. Retzlaff J., Sanders D. & Kraff M. Lens Implant Power Calculation, A Manual for Ophthalmologists & Biometrists - Third Edition, 1990
2. Holladay J. A Three-part System For Refining Intraocular Lens Power Calculations. J. Cataract Refract. Surg. V14:17-24, 1988
3. Holladay J. Standardizing Constants For Ultrasonic Biometry, Keratometry & IOL Power Calculations. J. Cataract Refract. Surg. V23:1356 1370, 1997
4. Hoffer K. The Hoffer Q Formula: A Comparison of Theoretic and Regression Formulas. J. Cataract Refract. Surg. V19:700-712, 1993; ERRATA, 20:677, 1994

Clinical studies

Clinical studies have not been conducted with the 600C Aspheric lens to assess the effect of its aspheric surface or increased optic size and overall diameter on spherical aberration, visual acuity or contrast sensitivity.

The Rayner C-*flex*® 570C intraocular lens study was a multi-center, clinical trial, with historical control designed to assess safety and efficacy.

Primary efficacy analyses are based on Best Case Visual Acuity at one-year post implantation as determined in the sample of procedures with no pre-existing macular degeneration, or with macular degeneration developing at any time during the study, or with a clinically significant violation of exclusion/inclusion criteria.

Safety is evaluated with regard to specific cumulative adverse event rates and persistent adverse events rates as specified in the FDA Intraocular Lens Guidelines, 1999[7] and ISO 11979-7. Primary safety analyses are based on data from all enrolled procedures with follow-up to at least one-year post implantation.

The results achieved by 283 patients in the C-*flex*® 570C study and 166 patients in the Center*flex* IOL study followed for one year, provide the basis for the data which were used to support that the Rayner 600C IOL design can be used for the visual correction of aphakia.

Patient population:

Three hundred and one (301) C-*flex*® patients were enrolled (unilateral implants) in this investigation. Additionally, data from one hundred and eighty-two (182) model Center*flex* IOL patients was used as supporting data.

The Center*flex* IOL is identical to the C-*flex*® model in all aspects except that the C-*flex*® additionally features an 'Enhanced Square Edge'. This feature is a 360° raised ridge encircling the periphery of both the anterior and posterior surfaces of the optic body (including the optic-haptic junction).

The patient combined C-*flex*® / Center*flex* population enrolled, consisted of 63.8% females and 36.2% males. The operative eye percentage was 47.4% left and 52.6% right. Corneal status was, for the most part, normal and any pre-operative pathology was at a low percentage of the total patients enrolled. Cataract etiology was 100% senile. The mean age of males and females was 72.8 years. Ethnicity was 99.4% Caucasian, 0.4% Hispanic and 0.2% Asian.

Visual acuity

The Rayner C-*flex*® IOL met, or exceeded, historical controls for posterior chamber IOLs in all areas, for best corrected visual acuity at the 12-month post-operative examination.

Best Case Visual Acuity (BCVA) and Overall Visual Acuity, greater than 20/40, was 98.2% and 99.5% compared to the FDA historical control figures of 92.5% and 96.7% respectively (Tables 1 & 2).

Table 1. Investigational Model vs. Historical Model Best Case Visual Acuity[A] (% with at least 20/40) One Year

	Posterior Chamber Historical Control[B]		Center*flex* IOL		C-*flex*® IOL		Pooled Center*flex* and C-*flex*® data	
Age Category	n/N	%	n/N	%	n/N	%	n/N	%
<60	203/206	98.5	6/6	100	24/24	100	30/30	100
60-69	793/822	96.5	41/41	100	61/61	100	102/102	100
70-79	1338/1372	97.5	71/72	98.6	116/117	99.1	187/189	98.9
≥80	601/634	94.8	17/17	100	36/36	100	53/53	100
Overall	2935/3034	96.7	135/136	99.4	237/238	99.6	372/374	99.5

Notes:

[A] BCVA is summarized for the Primary Efficacy Sample that excludes patients with preoperative ocular pathologies and those with macular degeneration developing at any time during the study.

[B] Annex B – FDA grid of historical controls: BCVA at one year, FDA Intraocular Lens Guidelines, 1999.

Table 2. Investigational Model vs. Historical Model Overall Visual Acuity (% with at least 20/40) One Year

	Posterior Chamber Historical Control[B]		Center*flex* IOL		C-*flex*® IOL		Pooled Center*flex* and C-*flex*® data	
Age Category	n/N	%	n/N	%	n/N	%	n/N	%
<60	230/235	95.7	6/6	100	24/24	100	30/30	100
60-69	968/1012	93.4	42/42	100	66/66	100	108/108	100
70-79	1793/1920	86.5	83/84	98.8	139/140	99.3	222/224	99.1
≥80	901/1042	92.5	30/34	88.2	51/53	96.2	81/87	93.1
Overall	3893/4210	92.5	161/166	97.0	280/283	98.9	441/449	98.2

Notes:

[A] Overall visual acuity is summarized for All Enrolled Procedures sample that only excludes second implants for any patient implanted bilaterally.

[B] Annex B – FDA grid of historical controls: BCVA at one year, FDA Intraocular Lens Guidelines, 1999.

Safety

Cumulative and persistent adverse events at one year are less than historical controls in all areas pooled except persistent macular edema, persistent corneal edema and cumulative pupillary block.

The C-*flex*® / Center*flex* rates were not statistically significantly different from the grid rates for all of the listed cumulative and persistent adverse event types. Please refer to Table 3.