

Raytrace  
Premium IOL Calculator

## Raytrace version 3.5 User Guide

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## INTRODUCTION TO RAYTRACE

Raytrace is Rayner's proprietary online calculator for premium IOLs. It is particularly useful as a toric IOL calculator and has been used worldwide since 2008. Raytrace was one of the first online calculation tools and is trusted by surgeons all over the world for the accuracy of its premium IOL (toric, multifocal and supplementary) calculations. Raytrace offers surgeons an online IOL power calculator which is quick and easy to use, providing clear and accurate power recommendations for Rayner's complete range of premium IOLs.

Raytrace version 3.5 returns to one-page view for data input and IOL calculations, together with the inclusion of posterior corneal astigmatism for capsular bag lenses.

The screenshot shows the Raytrace Premium IOL Calculator website. At the top left is the Raytrace logo with the tagline 'Premium IOL Calculator' and a link 'ADD A NEW PATIENT'. At the top right is a UK flag icon and a 'Sign in' link. The main heading is 'Add a New Patient' in green, followed by a subtext: 'Our new calculator will allow you to compare all available product options. Please begin by identifying the type of lens you require.' Below this are two columns of lens options. The left column, titled 'MAIN LENS for aphakic', lists 'RayOne Toric & T-flex®', 'RayOne Trifocal', and 'RayOne Trifocal Toric'. The right column, titled 'SUPPLEMENTARY LENS for pseudophakic', lists 'Sulcoflex Aspheric', 'Sulcoflex Trifocal', and 'Sulcoflex Toric'. Each option has a small icon of the lens and a right-pointing arrow. Below these columns is a section for 'RayPRO REPORTING ON PATIENT OUTCOMES' featuring a monitor and smartphone displaying data, with 'Google Play' and 'App Store' download buttons and a 'Learn more >' link. The footer includes the Rayner logo with the tagline 'Your skill. Our vision.', copyright information '©2020 Rayner Intraocular Lenses Limited. Version: 2020:3.5. Address: 10 Dominion Way, Worthing, West Sussex, BN14 8AQ, United Kingdom', and links for 'TERMS OF USE' and 'PRIVACY POLICY'.

Raytrace®  
Premium IOL Calculator

[ADD A NEW PATIENT](#)

Sign in

### Add a New Patient

Our new calculator will allow you to compare all available product options. Please begin by identifying the type of lens you require.

MAIN LENS for aphakic	SUPPLEMENTARY LENS for pseudophakic
RayOne Toric & T-flex® >	Sulcoflex Aspheric >
RayOne Trifocal >	Sulcoflex Trifocal >
RayOne Trifocal Toric >	Sulcoflex Toric >

RayPRO  
REPORTING ON  
PATIENT OUTCOMES

Learn more >

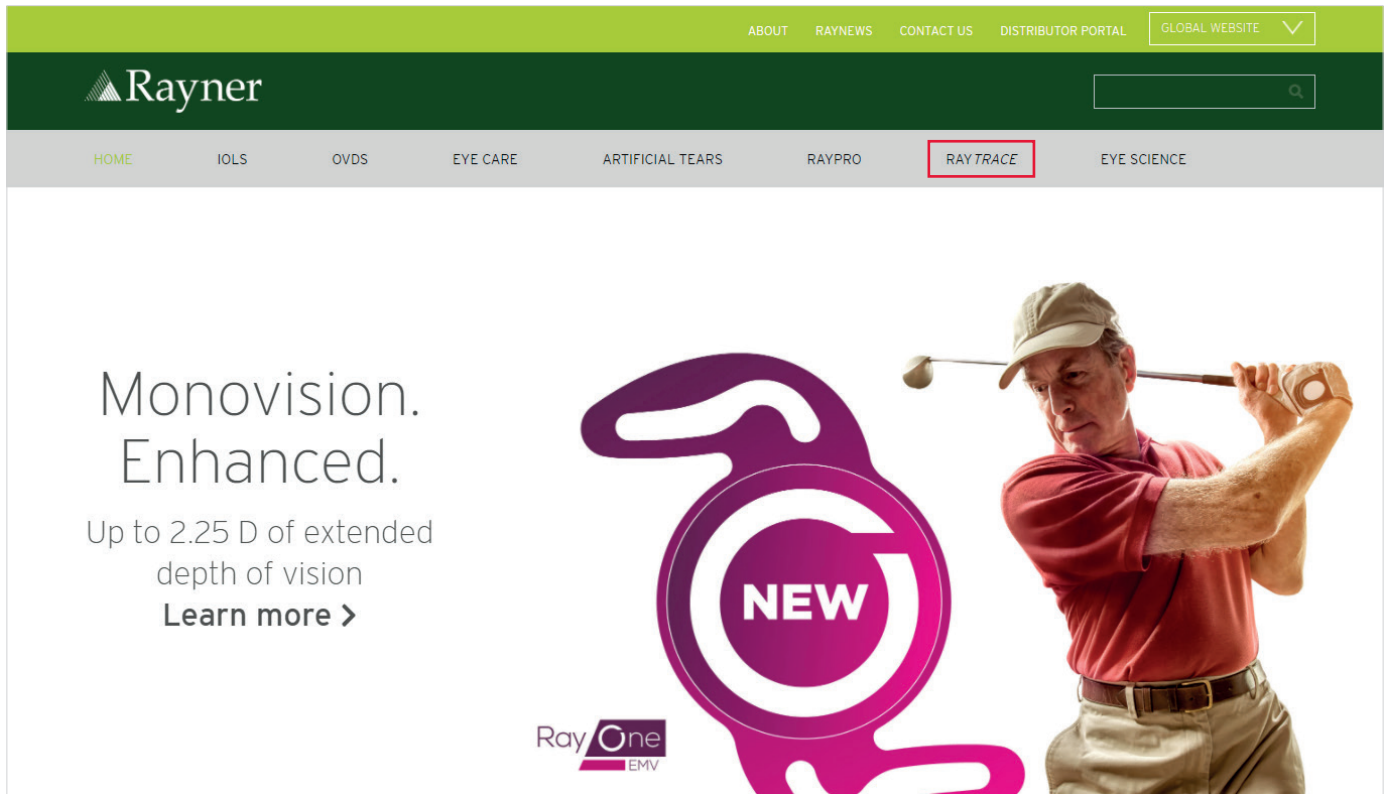
Rayner  
Your skill. Our vision.

©2020 Rayner Intraocular Lenses Limited.  
Version: 2020:3.5  
Address: 10 Dominion Way, Worthing, West Sussex, BN14 8AQ, United Kingdom

[TERMS OF USE](#) [PRIVACY POLICY](#)

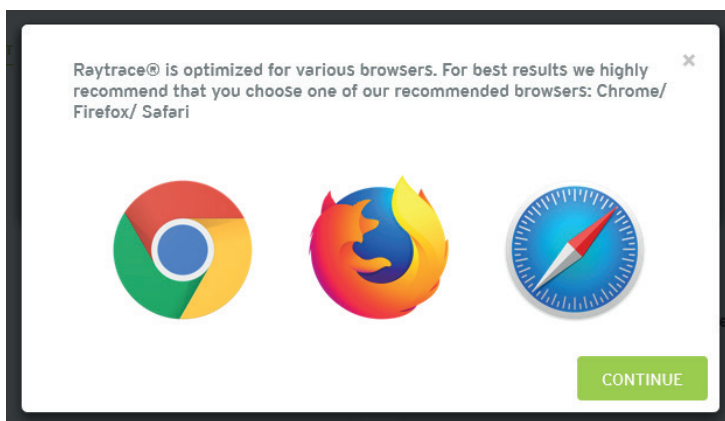
## ACCESSING RAYTRACE

Raytrace can be accessed via the Rayner website, or [www.raytrace.rayner.com](http://www.raytrace.rayner.com)



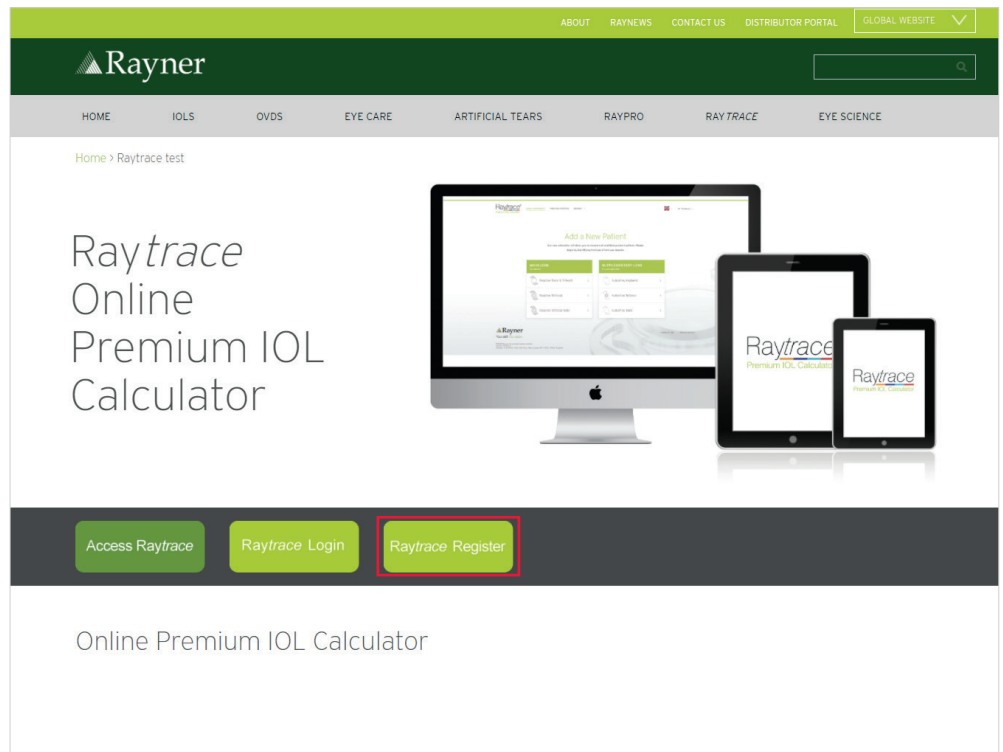
Raytrace is supported by the following web browsers:

- Google Chrome (PC/MAC)
- Mozilla Firefox (PC/MAC)
- Apple Safari



## NEW USER REGISTRATION

New users can visit  
[www.rayner.com/raytrace](http://www.rayner.com/raytrace)  
 and click on  
**Raytrace Register.**



New users should complete the registration form, providing personal and hospital/clinic details (country is mandatory). The username can be the same as the email address associated with the account.

Please provide details of your main hospital/clinic that you will be using Raytrace for. Additional hospital/clinics can be added in Account Settings once registered.

Please provide some details about yourself and set a password. You can set the username to be the same as your email or different.

TITLE:	Mr	▼
FIRST NAME:		
LAST NAME:		
EMAIL ADDRESS:	eg. bobk@example.com	
USERNAME:	eg. same as email or other	
PASSWORD:	eg. ...	
PASSWORD CONFIRMATION:	eg. ... (repeat password here)	

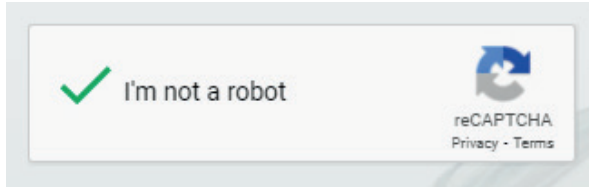
HOSPITAL/CLINIC:	
COUNTRY: *	Select ▼
ADDRESS LINE 1:	
ADDRESS LINE 2:	
CITY:	
POSTCODE/ZIP CODE:	
TELEPHONE NUMBER:	
FAX NUMBER:	
CONTACT NAME (IF DIFFERENT FROM MAIN USER)	
CONTACT EMAIL ADDRESS (ONE OR MORE COMM/ SEPARATED ADDRESSES)	eg. a.b@expl.com, m.m@expl.com

☐ I'm not a robot

reCAPTCHA
   
Privacy • Terms

SIGN UP/ REGISTER

On the registration form, the user must select 'I am not a robot' in the reCAPTCHA checkbox and once the green tick appears, the user can select 'Sign up/ Register'.



Upon successful registration, the user receives a 'Welcome to Raytrace' email to the email address listed on the registration form. The user must confirm their email address by selecting 'clicking here' on the verification link included within the verification email.



Version: 2020:3.5

Dear Mr Raytrace Test,

Thank you for registering to use Raytrace, Rayner's online Specialist IOL Calculator.

Your username is:

Before being able to login and start using Raytrace we'd like to verify that this is your email address by clicking [here](#)

If you have questions regarding the use of Raytrace, please contact your local Rayner sales representative or visit [www.rayner.com/raytrace](http://www.rayner.com/raytrace) for a link to the Raytrace User Manual.

Kind regards,

The Raytrace Team

This email has been automatically generated. Please do not reply to it. If you need to contact us about Raytrace please email [raytrace@rayner.com](mailto:raytrace@rayner.com).

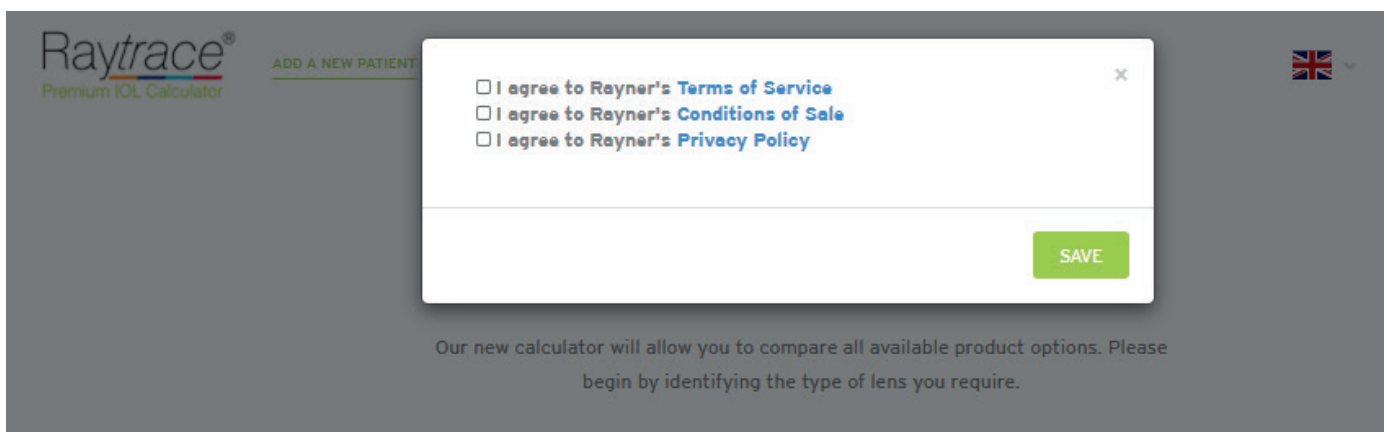
Rayner Intraocular Lenses Ltd.  
10 Dominion Way  
Worthing, West Sussex  
BN14 8AQ, United Kingdom

T: +44 (0) 1903 258900  
W: [www.rayner.com](http://www.rayner.com)



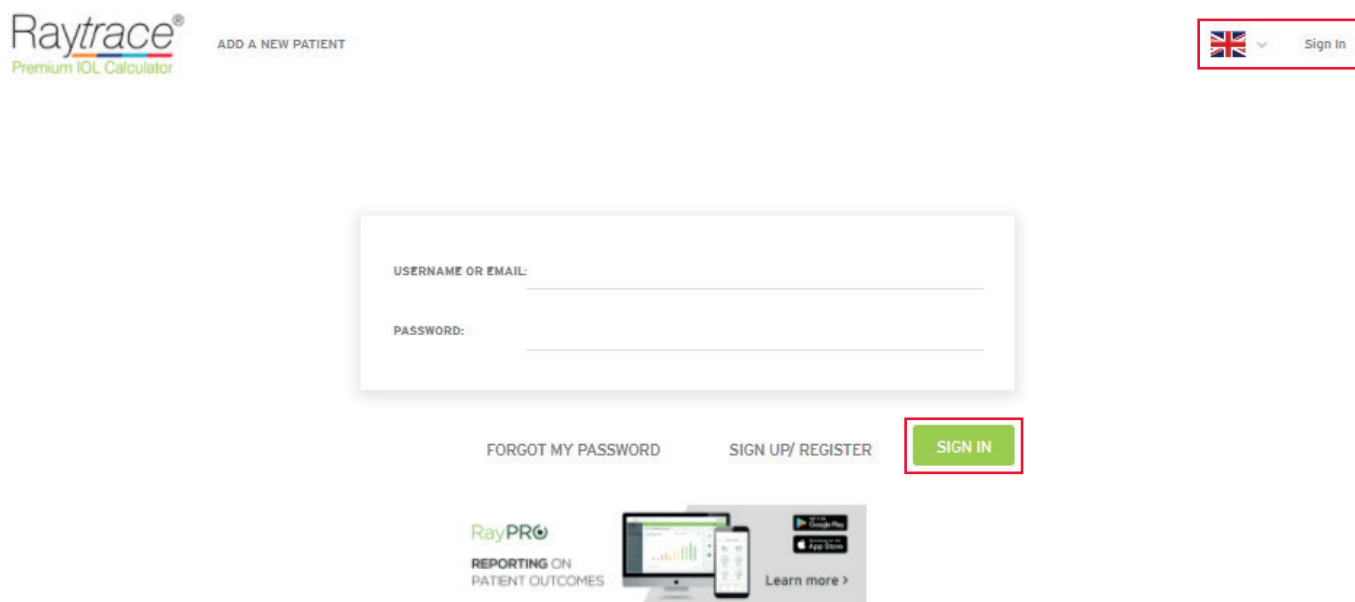
Once the account has been verified, the user can log in to their Raytrace account. Each new user will be assigned to a Rayner sales representative or distributor partner in order to receive continued service and support.

When first logging into Raytrace, or for any updates to Raytrace legal terms, the legal terms will be displayed for a user and all three legal terms must be agreed to by selecting the check boxes:



## EXISTING USERS

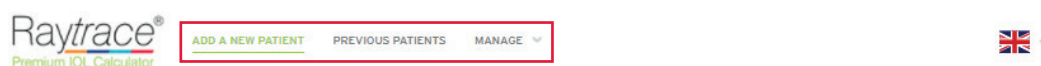
Existing users can sign in using the 'Sign In' link at the top of the Raytrace page or by selecting the green 'Sign in' button. The users will be prompted for their Raytrace username and password:



The image shows the Raytrace Premium IOL Calculator sign-in page. At the top left is the Raytrace logo and the text 'Premium IOL Calculator'. Next to it is a link 'ADD A NEW PATIENT'. At the top right is a language selector with a UK flag and a 'Sign in' button. In the center is a sign-in form with two fields: 'USERNAME OR EMAIL:' and 'PASSWORD:'. Below the form are three links: 'FORGOT MY PASSWORD', 'SIGN UP/ REGISTER', and a green 'SIGN IN' button. At the bottom is a section for 'RayPRO REPORTING ON PATIENT OUTCOMES' with a 'Learn more >' link.

Upon successful sign in/registration, the user shall see the initial lens selection menu with the following options:

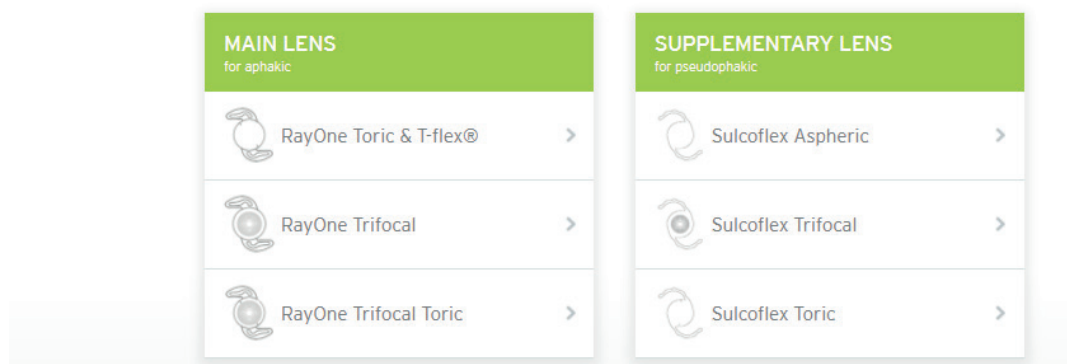
- Add a new patient
- View previous patient calculations
- Manage account settings (changing password, add new hospitals)



The image shows the Raytrace Premium IOL Calculator user menu. At the top left is the Raytrace logo and the text 'Premium IOL Calculator'. Next to it are three links: 'ADD A NEW PATIENT', 'PREVIOUS PATIENTS', and 'MANAGE'. At the top right is a language selector with a UK flag.

## Add a New Patient

Our new calculator will allow you to compare all available product options. Please begin by identifying the type of lens you require.

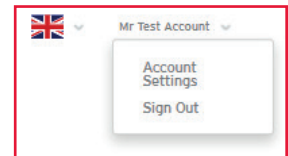


The image shows the 'Add a New Patient' lens selection menu. It is divided into two columns: 'MAIN LENS for aphakic' and 'SUPPLEMENTARY LENS for pseudophakic'. Each column has a list of lens options with icons and right-pointing arrows.

MAIN LENS for aphakic	SUPPLEMENTARY LENS for pseudophakic
RayOne Toric & T-flex®	Sulcoflex Aspheric
RayOne Trifocal	Sulcoflex Trifocal
RayOne Trifocal Toric	Sulcoflex Toric

## SIGN OUT AND LANGUAGE SELECTION

At the end of the session, the user can sign out of Raytrace by selecting the menu in the top right hand corner and selecting 'Sign Out'. Raytrace is available in various languages (German, French, Spanish and Portuguese) and this can be amended by changing the small flag selection in the top right hand corner.

[ADD A NEW PATIENT](#)[PREVIOUS PATIENTS](#)[MANAGE](#)

## Add a New Patient

Our new calculator will allow you to compare all available product options. Please begin by identifying the type of lens you require.

MAIN LENS for aphakic	SUPPLEMENTARY LENS for pseudophakic
RayOne Toric & T-flex® >	Sulcoflex Aspheric >
RayOne Trifocal >	Sulcoflex Trifocal >
RayOne Trifocal Toric >	Sulcoflex Toric >

## FORGOTTEN PASSWORD

If the password is forgotten, please select 'Forgot My Password':

USERNAME OR EMAIL:

PASSWORD:

[FORGOT MY PASSWORD](#)[SIGN UP/ REGISTER](#)[SIGN IN](#)

REPORTING ON  
PATIENT OUTCOMES



Learn more >



Enter the email address used for registration and select 'I am not a robot' in the reCAPTCHA checkbox and once the green tick appears, the user can continue by selecting 'Send Email With Instructions':

The screenshot shows the Raytrace Premium IOL Calculator website. At the top left is the Raytrace logo and 'ADD A NEW PATIENT' link. At the top right is a UK flag and 'Sign In' link. The main heading is 'Forgot my password'. Below it is a form with two fields: 'Username or Email' containing 'test@rayner.com' and a reCAPTCHA box with a green checkmark and the text 'I'm not a robot'. Below the reCAPTCHA box is a blue button labeled 'Send Email With Instructions'.

The user will receive a Raytrace 'Login Instructions' email to the email address listed on the registration form. The user must select 'Reset my password' on the verification link that is available in the email.

The screenshot shows an email from Rayner. The header includes the Rayner logo and 'Your skill. Our vision.' and the Raytrace Premium IOL Calculator logo. The body of the email starts with 'Dear Mr', followed by a paragraph: 'If you have either forgotten your Raytrace account password or would like to reset it, please use the link below.' Below this is a red box containing the text 'Reset my password'. The email continues with 'Your Raytrace username is:', 'This request was made on 2019-09-30T09:49:41+00:00.', and 'If you have questions regarding the use of Raytrace, please contact your local Rayner sales representative or visit [www.rayner.com/raytrace](http://www.rayner.com/raytrace) for a link to the Raytrace User Manual.' It ends with 'Kind regards, The Raytrace Team' and 'This email has been automatically generated. Please do not reply to it. If you need to contact us about Raytrace please email [raytrace@rayner.com](mailto:raytrace@rayner.com).' The footer contains Rayner Intraocular Lenses Ltd. contact information, a phone number, a website, and a registered office address. A Rayner logo is also in the footer.

The user will be redirected to the Raytrace website, where the new password can be created. Alternatively contact [eyescience@rayner.com](mailto:eyescience@rayner.com) for support.

The screenshot shows the Raytrace Premium IOL Calculator website. At the top left is the Raytrace logo and 'ADD A NEW PATIENT' link. The main heading is 'Change password'. Below it is a form with two fields: 'Password' and 'Password confirmation', both containing 'eg. ...'. Below the form is a blue button labeled 'Change password'.

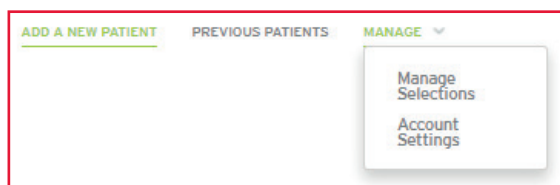
## DISTRIBUTOR ACCOUNT

Customer Services and Eye Science continue to monitor new Raytrace user registrations and all new surgeons in our distributor markets can be assigned to their relevant distributor. Therefore, if your account requires distributor privileges, please contact your Rayner representative, or alternatively email [eyescience@rayner.com](mailto:eyescience@rayner.com) or [orders@rayner.com](mailto:orders@rayner.com) for support.

Upon successful sign in/registration, a distributor shall see the initial lens selection menu where:

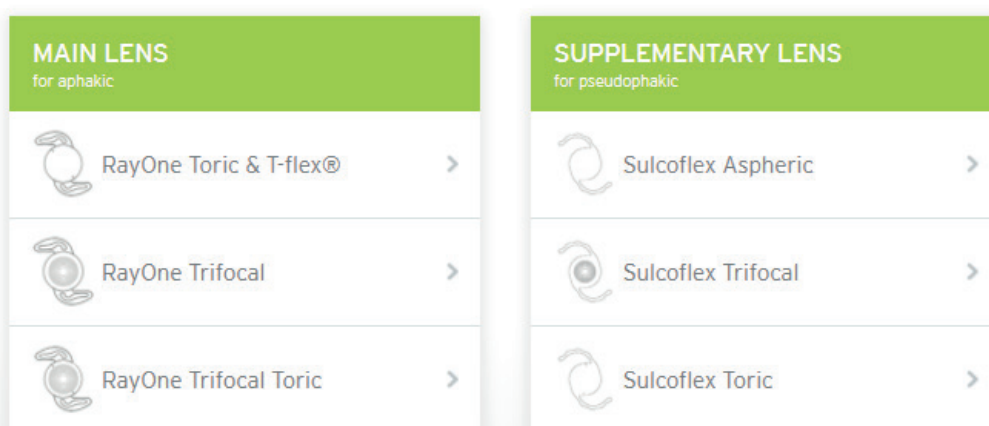
- Calculation for a new patient can be added
- Previous calculations can be viewed
- **Manage selections** (note, this is the only difference between Surgeon and Distributor account)
- Manage Account Settings (changing password, add new hospitals)

Distributor accounts can view the calculations and confirmed calculations that were performed by the surgeons via the hospital that is assigned under the representative distributor account, under 'Manage Selections'.



### Add a New Patient

Our new calculator will allow you to compare all available product options. Please begin by identifying the type of lens you require.



## DATA ENTRY: Patient Information

After selecting a lens type, the first step of the IOL calculation is to enter the patient's information in order to identify the calculation against the correct patient:

The screenshot displays the Raytrace Premium IOL Calculator interface. The top navigation bar includes the Raytrace logo, 'ADD A NEW PATIENT', 'PREVIOUS PATIENTS', and 'MANAGE'. A user profile dropdown shows a UK flag and 'Mr Test Account'. The main form is divided into several sections:

- Patient ID:** A red box highlights the 'PATIENT ID' field with a red asterisk, containing the text '# Test'.
- Subject Eye:** Radio buttons for 'OD (right)' and 'OS (left)'. 'OS (left)' is selected.
- Target Refraction:** A field showing '-0.5 D'.
- Surgeon Name:** A field containing 'Mr Test Account'.
- Hospital/Clinic:** A dropdown menu showing 'Test Clinic' and a '+ NEW' button.
- Date of Surgery:** Fields for 'DD', 'MMM', and 'YYYY'.
- Pre-operative Refraction:** Fields for 'Sph', 'D', 'Cyl', 'D', 'Axis', and 'Deg'.
- Axial Length:** A field for 'mm'.
- Method:** A dropdown menu with 'Select'.
- ACD:** A field for 'mm'.
- K Units:** Radio buttons for 'mm' and 'D'.
- SIA:** A field for 'D'.
- Incision Location:** A field for 'Deg'.
- Allow for PCA:** A checked checkbox.

On the right side, there is a visual representation of an eye with a circular overlay indicating the IOL axis and incision location. Below this, it says 'Raytrace number N/A' and a large green 'CALCULATE' button.

**Patient ID:** Users should always anonymise their patient identification. Due to GDPR legislation, Raytrace only allows for Patient ID details to be used in order to anonymise a patient. The Patient ID should NOT be the patient's name. Use of a patient's name is a breach of the Raytrace terms of use and the user shall bear full responsibility. Patient ID should be a reference **with NO SPACES** that allows you to identify the patient in conjunction with the user's records.

This screenshot shows the same Raytrace Premium IOL Calculator interface as the previous one, but with a warning message displayed over the 'PATIENT ID' field. The warning message states: 'Patient ID should be a reference with no spaces that allows you to identify the patient in conjunction with your records; for data protection compliance reasons, the Patient ID should NOT be the patient's name.' The 'PATIENT ID' field contains the text '# Test'.

**Subject Eye:** This is the patient's eye that is being operated on. Please select OD for right eye or OS for left eye.

**Target Refraction:** Users can enter planned target refraction post IOL implantation. For emmetropia, enter 0. However, Raytrace will also accept values within the range of -10.0 D to 10.0 D.

## DATA ENTRY: Surgery Details

Surgery details contain surgeon name, hospital registered under surgeon account and planned date of surgery:

Raytrace®  
Premium IOL Calculator

ADD A NEW PATIENT PREVIOUS PATIENTS MANAGE

UK Mr Test Account

PATIENT ID: # Test

SURGEON NAME: Mr Test Account

SUBJECT EYE: ☐ OD (right) ☒ OS (left)

HOSPITAL/CLINIC: Test Clinic NEW

TARGET REFRACTION: -0.5 D

DATE OF SURGERY: DD MMM YYYY

PRE-OPERATIVE REFRACTION: Sph D Cyl D Axis Deg

K UNITS: ☐ mm ☐ D

AXIAL LENGTH: mm

SIA: D

METHOD: Select

INCISION LOCATION: Deg

ACD: mm

☒ Allow for PCA

Left eye (OS)

90°

180°

270°

IOL Axis

Incision Location

Raytrace number N/A

CALCULATE

**Surgeon name** is auto populated. This entry will appear blank for the distributor account, where the surgeon's name can be entered manually.

**Hospital/Clinic** registered at the time of creating the account will appear here. It is a mandatory field. New or multiple clinics and hospitals can be entered by clicking on **+NEW**, this takes the user back to **My Account** where a new clinic or hospital can be added using the **ADD CLINIC** tab.

**Date of Surgery:** This entry is optional but can help with surgery planning.

Please edit any information you'd like to change below and click Update Settings to save your changes.  
Hospital/Clinic details can be edited by clicking on their name to expand or collapse information.

TITLE: Mr

FIRST NAME: Test

LAST NAME: Account

EMAIL ADDRESS: raypro@rayner.com

USERNAME: test123

PASSWORD: eg. ...

PASSWORD CONFIRMATION: eg. ... (repeat password here)

Hospital/Clinic: Test Clinic

ADD CLINIC UPDATE SETTINGS

## DATA ENTRY: Biometry

Biometry details contain pre-operative refraction, axial length, method, and anterior chamber depth (ACD). For calculation of primary capsular bag IOLs, these fields are mandatory:

- Axial length
- Method of biometry (optical/ultrasound/immersion ultrasound)
- Anterior chamber depth

Raytrace®  
Premium IOL Calculator

ADD A NEW PATIENT PREVIOUS PATIENTS MANAGE

PATIENT ID: # Test

SURGEON NAME: Mr Test Account

SUBJECT EYE: ☐ OD (right) ☒ OS (left)

HOSPITAL/CLINIC: Test Clinic (+) NEW

TARGET REFRACTION: -0.5 D

DATE OF SURGERY: DD MMM YYYY

PRE-OPERATIVE REFRACTION: (optional)

Sph D Cyl D Axis Deg

AXIAL LENGTH: 23.5 mm

METHOD: Optical

ACD: 3.25 mm

K UNITS: ☐ mm ☐ D

SIA: D

INCISION LOCATION: Deg

☒ Allow for PCA

Left eye (OS)

90°

180°

270°

IOL Axis

Incision Location

Raytrace number N/A

CALCULATE

**Pre-operative refraction** in sphere, cylinder and axis is mandatory only for calculation of Sulcoflex supplementary lenses. Value range accepted for Sphere and Cylinder is -30 to +30 and axis 1 to 180. The axial length, method and ACD is optional but recommended for Sulcoflex supplementary IOL power calculation.

**Axial Length** is measured from the epithelium to the retina and accept values within range from 15.00 to 40.00.

**Method** of biometry measurement is essential as the system will calculate the IOL using a different A-constant according to whether the data has been derived from ultrasound or optical methods. There are three different methods available:

- Optical
- Contact Ultrasound
- Immersion Ultrasound

**Anterior chamber depth** is measured from the epithelium to anterior crystalline lens surface and value range is from 1.50 to 6.00.

## DATA ENTRY: Keratometry

Keratometry details contain values for the corneal curvature (K1/K2) and axes (Degrees), surgically induced astigmatism (SIA), incision location and the new feature of posterior corneal astigmatism (PCA).

The screenshot displays the Raytrace Premium IOL Calculator interface. The top navigation bar includes 'ADD A NEW PATIENT', 'PREVIOUS PATIENTS', and 'MANAGE'. The user is logged in as 'Mr Test Account'. The main form is divided into several sections:

- Patient Information:** PATIENT ID: # Test; SUBJECT EYE: OD (right) / OS (left) (OS is selected); TARGET REFRACTION: -0.5 D.
- Surgeon Information:** SURGEON NAME: Mr Test Account; HOSPITAL/CLINIC: Test Clinic (+ NEW); DATE OF SURGERY: DD / MMM / YYYY.
- Pre-operative Refraction:** (optional) Sph, D, Cyl, D, Axis, Deg.
- Axial Length:** 23.5 mm.
- Method:** Optical.
- ACD:** 3.25 mm.
- Keratometry Section (highlighted with a red box):**
  - K UNITS: mm / D (D is selected).
  - KERATOMETER INDEX: 1.3375.
  - K1: 42 D 110 Deg.
  - K2: 44 D 20 Deg.
  - SIA: .25 D.
  - INCISION LOCATION: 100 Deg.
  - ☒ Allow for PCA.
- Eye Diagram:** A diagram of a left eye (OS) showing the IOL axis and incision location.
- Raytrace number:** N/A.
- Buttons:** CALCULATE, THEATRE VIEW, CREATE PDF.

**Keratometry (corneal)** curvature, where the user has the choice of calculating for the IOL either in mm or in dioptric power (D). This must be selected by the user. The keratometry index (1.3375 or 1.3320) must also be selected, where the keratometry index is the nominal value of the refractive index used by the biometry system to convert measured radii to Dioptres. Users will input the K values from the optical biometry report and the degrees for the K1 and K2 axes.

**Surgically induced astigmatism (SIA)** is an optional input for the change in corneal astigmatism induced during the surgery. The dioptre value entered for SIA represents the total change across both axes; e.g. a value of 0.5 D equals a decrease in corneal power of 0.25 D along the incision meridian and an increase of 0.25 D along the axes orthogonal to the incision. The entered SIA value can range from 0 to 1.5. Users must also indicate where the primary incision is planned. On-axis incisions can reduce the cylinder required on the IOL.

**Incision Location** is used for the position of the incision location for placing IOL. The range is from 0 to 359 degrees.

**Allow for PCA** is optional to include Posterior Corneal Astigmatism. If the user enters standard anterior 'K' values, this box shall be selected for an average amount of PCA. The PCA option is ticked by default. If the box is unticked, the calculation is not changed from the previous version of Raytrace and it does not consider PCA.

The PCA option is only included for calculation of the following lenses:

- T-flex
- RayOne Toric
- RayOne Trifocal
- RayOne Trifocal Toric

## CALCULATE RESULTS

Once the user has entered all IOL data and ticked to include/exclude PCA in the calculation, the user can calculate the outcome for the required IOL lens by selecting '**Calculate**'.

A unique **Raytrace number** is generated when the calculation is completed. The Raytrace number is essential for the tracking and monitoring of the confirmed IOL calculation.

The screenshot displays the Raytrace Premium IOL Calculator interface. The top navigation bar includes the Raytrace logo, 'ADD A NEW PATIENT', 'PREVIOUS PATIENTS', and a 'MANAGE' dropdown. On the right, there is a UK flag and a user account 'Mr Test Account'.

The main form is divided into several sections:

- Patient Information:** Includes fields for 'PATIENT ID' (with a '#' icon), 'SURGEON NAME' (set to 'Mr Test Account'), 'SUBJECT EYE' (radio buttons for 'OD (right)' and 'OS (left)', with 'OS (left)' selected), 'HOSPITAL/CLINIC' (set to 'Test Clinic' with a '+ NEW' button), 'TARGET REFRACTION' (set to '-0.5 D'), and 'DATE OF SURGERY' (fields for DD, MMM, and YYYY).
- Pre-operative Refraction:** Includes 'PRE-OPERATIVE REFRACTION' (optional), 'AXIAL LENGTH' (set to '23.5 mm'), 'METHOD' (set to 'Optical'), and 'ACD' (set to '3.25 mm').
- Keratometer and Incision Data:** Includes 'K UNITS' (radio buttons for 'mm' and 'D', with 'D' selected), 'KERATOMETER INDEX' (set to '1.3375'), 'K1' (set to '42 D 110 Deg'), 'K2' (set to '44 D 20 Deg'), 'SIA' (set to '.25 D'), 'INCISION LOCATION' (set to '100 Deg'), and a checkbox for 'Allow for PCA' which is checked.
- Eye Diagram:** A simulated eye diagram for the 'Left eye (OS)' showing the IOL axis and incision location. The IOL axis is marked with a yellow line and '15°', and the incision location is marked with a blue line and '15°'.



At the bottom right, there is a summary box containing the 'Raytrace number: 208276', a green 'CALCULATE' button, a grey 'THEATRE VIEW' button, and a green 'CREATE PDF' button.

Raytrace generates a selection of IOL options based on their sphere, spherical equivalent (SE) and cylinder combinations that come as close as possible to the target refraction that the user indicated.

This example shows calculation with PCA. The top selection outcomes, '**Selected for you**', are preloaded IOLs from the RayOne family. In the section '**Other Rayner products**', the IOLs are loadable legacy T-flex IOLs. The IOLs are listed as IOL Proposal leading onto **Estimated post-op refraction** for sphere, spherical equivalent and cylinder. In this case all the IOLs will correct the cylinder to 0.1 D leaving residual amounts of myopia (minus values) or hyperopia (positive values).



☒ Allow for PCA ?

IOL proposal					Estimated post-op refraction				
IOL Range	Model	SE (D)	Sphere (D)	Cylinder (D)	SE (D)	Sphere (D)	Cylinder (D)	Select	
SELECTED FOR YOU ^									
 <b>RayOne Toric</b> <small>Note: Verify incision location.</small>	STANDARD	610T	22.0	20.25	3.5	-0.2	-0.2	0.1	<input type="radio"/>
		610T	22.5	20.75	3.5	-0.6	-0.6	0.1	<input type="radio"/>
		610T	23.0	21.25	3.5	-0.9	-0.9	0.1	<input type="radio"/>
OTHER RAYNER PRODUCTS ^									
 <b>T-flex</b> <small>Note: Verify incision location.</small>	STANDARD	623T	22.3	20.5	3.5	-0.4	-0.4	0.1	<input type="radio"/>
		623T	22.8	21.0	3.5	-0.7	-0.8	0.1	<input type="radio"/>
		623T	23.3	21.5	3.5	-1.1	-1.1	0.1	<input type="radio"/>



RECALCULATE VALUES: SE  D Cylinder  D RECALCULATE

Nominal values - SE: 22.42 | sphere 20.71 | cyl: 3.43

The calculation can be repeated without PCA by unselecting the PCA option and selecting '**Calculate**'. In the notes section, the message is displayed 'PCA not included'.



☐ Allow for PCA ?

IOL proposal						Estimated post-op refraction			
IOL Range	Model	SE (D)	Sphere (D)	Cylinder (D)	SE (D)	Sphere (D)	Cylinder (D)	Select	
SELECTED FOR YOU ^									
 <b>RayOne Toric</b> <small>Note: Verify incision location.</small> <span style="border: 1px solid red; padding: 2px;">Note: PCA is not included.</span>	STANDARD <span style="background-color: #90EE90; border-radius: 50%; padding: 2px;">S</span>	610T	22.0	20.5	3.0	-0.2	-0.3	0.1	<input type="radio"/>
		610T	22.5	21.0	3.0	-0.6	-0.6	0.1	<input type="radio"/>
		610T	23.0	21.5	3.0	-0.9	-1.0	0.1	<input type="radio"/>
OTHER RAYNER PRODUCTS ^									
 <b>T-flex</b> <small>Note: Verify incision location.</small> <span style="border: 1px solid red; padding: 2px;">Note: PCA is not included.</span>	STANDARD <span style="background-color: #90EE90; border-radius: 50%; padding: 2px;">S</span>	623T	22.0	20.5	3.0	-0.2	-0.3	0.1	<input type="radio"/>
		623T	22.5	21.0	3.0	-0.6	-0.6	0.1	<input type="radio"/>
		623T	23.0	21.5	3.0	-0.9	-1.0	0.1	<input type="radio"/>

RECALCULATE VALUES: SE  D Cylinder  D RECALCULATE

Nominal values - SE: 22.42 | sphere 21.00 | cyl: 2.85



Note that all the IOLs presented in this example are **Standard IOL** and they should be available in stock and will not incur the additional cost of a **Made to Order IOL**. Made to Order lenses are normally subject to a longer delivery time, which can be provided by Customer Services as these lenses are manufactured outside of the standard range availability. The distinction between made to order and standard, is dictated by the Spherical Equivalent combination power i.e. the sphere + half the cylinder power. Further details can be found on [www.rayner.com](http://www.rayner.com).

## RECALCULATION & NOMINAL VALUES



Two new features are available in Raytrace v3.5 and these are used for:

- Recalculation based on IOL availability
- Nominal Values for Spherical Equivalent, Sphere and Cylinder

**Recalculation** of IOL results is based on the spherical equivalence and cylinder. The example below is for the RayOne Toric and T-Flex lenses. The calculation outcome are IOLs with SE 17.5 D, 18.0 D and 18.5 D with cylinder 3.0 D.

IOL proposal					Estimated post-op refraction				
IOL Range	Model	SE (D)	Sphere (D)	Cylinder (D)	SE (D)	Sphere (D)	Cylinder (D)	Select	
<b>SELECTED FOR YOU</b> ^									
 <b>RayOne Toric</b> <small>Note: Verify incision location.</small> <small>Note: PCA is not included</small>	STANDARD	610T	17.5	16.0	3.0	0.1	0.1	-0.0	<input type="radio"/>
		610T	18.0	16.5	3.0	-0.3	-0.3	-0.0	<input type="radio"/>
		610T	18.5	17.0	3.0	-0.7	-0.7	-0.0	<input type="radio"/>
<b>OTHER RAYNER PRODUCTS</b> ^									
 <b>T-flex</b> <small>Note: Verify incision location.</small> <small>Note: PCA is not included</small>	STANDARD	623T	17.5	16.0	3.0	0.1	0.1	-0.0	<input type="radio"/>
		623T	18.0	16.5	3.0	-0.3	-0.3	-0.0	<input type="radio"/>
		623T	18.5	17.0	3.0	-0.7	-0.7	-0.0	<input type="radio"/>
<b>RECALCULATE VALUES:</b> SE <input type="text"/> D Cylinder <input type="text"/> D <small>(optional)</small>					<input type="button" value="RECALCULATE"/>				

The image below shows a recalculation with SE of 12 D and Cylinder of 1 D. The recalculated outcome are IOLs with SE of 11.5 D, 12.0 D and 12.5 D with a Cylinder of 1.0 D. Note: estimated post-op refraction is recalculated. This is a very popular feature for distributors and Customer Services as it is possible to recalculate a lens based on stock availability.





IOL proposal					Estimated post-op refraction				
IOL Range	Model	SE (D)	Sphere (D)	Cylinder (D)	SE (D)	Sphere (D)	Cylinder (D)	Select	
<b>SELECTED FOR YOU</b> ^									
 <b>RayOne Toric</b> <small>Note: Verify incision location.</small> <small>Note: Target post op refraction not reached (STD IOLs).</small> <small>Note: PCA is not included</small>	STANDARD	610T	11.5	11.0	1.0	4.3	5.1	-1.4	<input type="radio"/>
		610T	12.0	11.5	1.0	4.0	4.7	-1.4	<input type="radio"/>
		610T	12.5	12.0	1.0	3.6	4.3	-1.4	<input type="radio"/>
<b>OTHER RAYNER PRODUCTS</b> ^									
 <b>T-flex</b> <small>Note: Verify incision location.</small> <small>Note: Target post op refraction not reached (STD IOLs).</small> <small>Note: PCA is not included</small>	STANDARD	623T	11.5	11.0	1.0	4.3	5.1	-1.4	<input type="radio"/>
		623T	12.0	11.5	1.0	4.0	4.7	-1.4	<input type="radio"/>
		623T	12.5	12.0	1.0	3.6	4.3	-1.4	<input type="radio"/>
<b>RECALCULATE VALUES:</b> SE <input type="text"/> D Cylinder <input type="text"/> D <small>(optional)</small>					<input type="button" value="RECALCULATE"/>				

**Nominal values** located under the Recalculation feature display the values of the IOL calculation.

In the example below for a toric IOL, it states:

- Nominal SE value of 22.42 D
- Nominal sphere value of 21.0 D
- Nominal cylinder value of 2.85 D

**Nominal values - SE: 22.42 | sphere 21.00 | cyl: 2.85**

		IOL proposal				Estimated post-op refraction			
	IOL Range	Model	SE (D)	Sphere (D)	Cylinder (D)	SE (D)	Sphere (D)	Cylinder (D)	Select
SELECTED FOR YOU ^									
 <p><b>RayOne Toric</b></p> <p><b>Note:</b> Verify incision location.</p> <p><b>Note:</b> PCA is not included</p>	<b>STANDARD</b> 	610T	22.0	20.5	3.0	-0.2	-0.3	0.1	<input type="radio"/>
		610T	22.5	21.0	3.0	-0.6	-0.6	0.1	<input type="radio"/>
		610T	23.0	21.5	3.0	-0.9	-1.0	0.1	<input type="radio"/>
OTHER RAYNER PRODUCTS ^									
 <p><b>T-flex</b></p> <p><b>Note:</b> Verify incision location.</p> <p><b>Note:</b> PCA is not included</p>	<b>STANDARD</b> 	623T	22.0	20.5	3.0	-0.2	-0.3	0.1	<input type="radio"/>
		623T	22.5	21.0	3.0	-0.6	-0.6	0.1	<input type="radio"/>
		623T	23.0	21.5	3.0	-0.9	-1.0	0.1	<input type="radio"/>
<b>RECALCULATE VALUES:</b> SE <input type="text" value="1"/> D Cylinder <input type="text"/> D <small>(optional)</small>						<b>RECALCULATE</b>			
<b>Nominal values - SE: 22.42   sphere 21.00   cyl: 2.85</b>									

## IOL LENS SELECTION

It is important for a user to use their best clinical judgment when making their IOL selection and ensure that complete and accurate biometry measurements are taken, especially when implanting premium IOLs.

Once a user has selected their desired IOL in the Selection panel, Rayner's Conditions of Sale must be agreed to (by ticking the box shown below) prior to the calculation placement. Conditions of Sale can be accessed by selecting this and the user will be redirected to a separate browser window with the Raytrace Conditions of Sale. The Conditions of Sale are available in various languages (French, German, Spanish and Portuguese).

The image below shows the alignment of toric IOLs in the eye with the degree of alignment and the incision location clearly marked.

At this point the user can print the calculation via the 'Create PDF' option, or view this IOL option on the 'Theatre view' screen. In this example, the RayOne Toric 610T lens of SE 22.5 D, sphere 21.0 D and cylinder 3.0 D was selected.

PATIENT ID: \* # Test

SUBJECT EYE: \* ☐ OD (right) ☒ OS (left)

TARGET REFRACTION: -0.5 D

SURGEON NAME: Mr Test Account

HOSPITAL/CLINIC: Test Clinic  NEW

DATE OF SURGERY: (optional) DD MMM YYYY

PRE-OPERATIVE REFRACTION: (optional) Sph D Cyl D Axis Deg

AXIAL LENGTH: 23.5 mm

METHOD: \* Optical

ACD: 3.25 mm

K UNITS: ☐ mm ☒ D

KERATOMETER INDEX: 1.3375

K1: 42 D 110 Deg

K2: 44 D 20 Deg

SIA: .25 D

INCISION LOCATION: 100 Deg

☐ Allow for PCA ?

Left eye (OS)

Raytrace number: 208276

CALCULATE

THEATRE VIEW

CREATE PDF

☐ I agree to Rayner's Conditions of Sale

You must accept the terms and conditions to continue

CONFIRMATION

IOL proposal

Estimated post-op refraction

IOL Range	Model	SE (D)	Sphere (D)	Cylinder (D)	SE (D)	Sphere (D)	Cylinder (D)	Select	
SELECTED FOR YOU ^									
<div> RayOne Toric </div> <div> Note: Verify incision location. Note: PCA is not included </div>	STANDARD	610T	22.0	20.5	3.0	-0.2	-0.3	0.1	<input type="radio"/>
		610T	22.5	21.0	3.0	-0.6	-0.6	0.1	<input checked="" type="radio"/>
		610T	23.0	21.5	3.0	-0.9	-1.0	0.1	<input type="radio"/>

Once a user has selected 'I agree to Rayner's Conditions of Sale', the **Confirmation** option becomes available (under 'I agree to Rayner's Conditions of Sale') and the user can now submit the IOL selection. The user must either then select 'OK' in order to proceed with the selection or 'Cancel' this step and they will be returned to the IOL results where another lens can be selected.

Left eye (OS)

Raytrace number: 208276

**CALCULATE**

**THEATRE VIEW**

**CREATE PDF**

☒ I agree to Rayner's Conditions of Sale

**CONFIRMATION**

#### UK and Ireland Customers:

For Rayner to process your request please provide us with a Purchase Order from your hospital or clinic. The Purchase Order must include the unique Raytrace Number for this calculation. Rayner is unable to initiate the order process without a valid Purchase Order and Raytrace Number.

#### Overseas Customers:

An email with details of your Raytrace calculation and IOL selection has been sent to your local Rayner distributor. Please contact them directly, quoting the Raytrace number, for all order and delivery information.

Raytrace® Premium IOL Calculator

ADD A NEW PATIENT

PATIENT ID: \* # Test

SUBJECT EYE: \* ☐ OD (right) ☒ OS (left)

TARGET REFRACTION: -0.5 D

PRE-OPERATIVE REFRACTION: (optional) Sph D Cyl D

AXIAL LENGTH: \* 23.5 mm

METHOD: \* Optical

ACD: \* 3.25 mm

KERATOMETER INDEX: 1.3375

K1: 42 D 110 Deg

K2: 44 D 20 Deg

SIA: .25 D

INCISION LOCATION: 100 Deg

You are about to confirm your IOL selection.

UK and Ireland customers:  
For Rayner to process your request please provide us with a Purchase Order from your hospital or clinic. The Purchase Order must include the unique Raytrace number for this calculation. Rayner is unable to initiate the order process without a valid Purchase Order and Raytrace number.

Overseas customers:  
An email with details of your Raytrace calculation and IOL selection has been sent to your local Rayner distributor. Please contact them directly, quoting the Raytrace number, for all order and delivery information.

**CANCEL** **OK**

Left eye (OS)

Raytrace number: 208276

**CALCULATE**


**THEATRE VIEW**

## SUMMARY OF IOL CALCULATION

In the next step, the selected IOL lens is displayed in the summary page with all information (data entries) for the selected patient:

Patient Info		Surgery Details	
Patient ID:	Test	Surgeon name:	Mr Test Account
Subject eye:	OS (left)	Hospital/Clinic:	Test Clinic
Target refraction:	-0.5	Surgery Date:	

	IOL proposal				Estimated post-op refraction			
	IOL Range	Model	SE (D)	Sphere (D)	Cylinder (D)	SE (D)	Sphere (D)	Cylinder (D)
 RayOne Toric	STANDARD	610T	22.5	21.0	3.0	-0.6	-0.6	0.1

**IOL AXIS:19°**

Biometry		Keratometry	
Pre-operative refraction:	Sph D Cyl D Axis Deg	K units:	D
		Keratometer index:	1.3375
Axial length:	23.5mm	K1:	42.0 D 110.0 Deg
Method:	OPT	K2:	44.0 D 20.0 Deg
ACD:	3.25mm	SIA:	0.25D
		Incision location:	100 Deg

The user will receive a confirmation email with details of their IOL selection. The user must quote the Raytrace number when requesting any further information related to their selection. The user can then:

- Commence a new calculation by selecting the **'New Order'** option
- **'Create PDF'** of the current screen
- Select and view the **'Theatre view'** for the selected IOL lens
- **'Resend'** the emailed confirmation again to the email address used to create the user's account

### Distributor Accounts

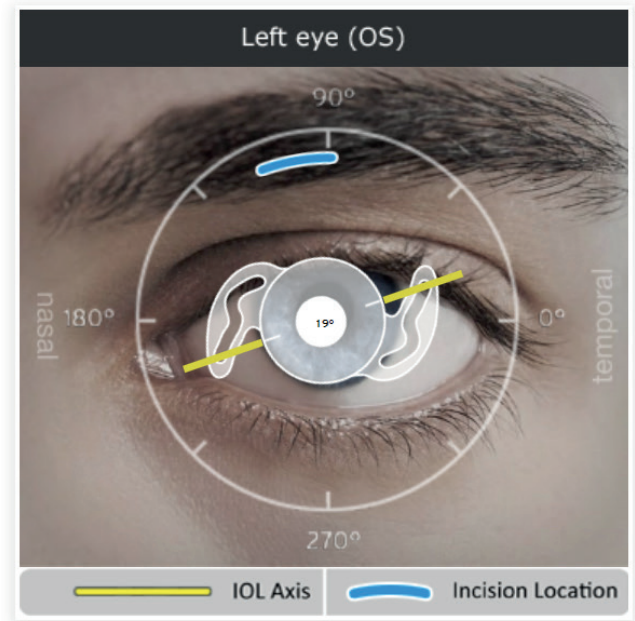
Distributors will also receive an emailed copy of the IOL selection confirmation and they are able to view the calculations on their distributor's account, under the 'Previous Patients' option.

# Your IOL selection has been placed!

A confirmation email has been sent to **test123**

Raytrace number **208276**

- NEW ORDER
- CREATE PDF
- THEATRE VIEW
- RESEND



**Theatre View**, all the data that the user would need or be reminded of before implantation, is contained on the Theatre view screen. This can be printed for use in the Theatre as an aide-memoire or for the patient's records or departmental records.

Raytrace®  
Premium IOL Calculator

ADD A NEW PATIENT PREVIOUS PATIENTS MANAGE

Mr Test Account

Left eye (OS)

IOL Axis

Incision Location

Patient ID  
Subject eye

Test  
OS (left)

IOL Model  
Power

Ray One Toric 610T  
SE: 22.50  
Sphere: 21.00  
Cylinder: 3.00  
IOL Axis: 19

CREATE PDF

Raytrace number 208276

Ray One Toric IOL proposal					Estimated post-op refraction		
IOL Range	Model	SE (D)	Sphere (D)	Cylinder (D)	SE (D)	Sphere (D)	Cylinder (D)
Standard	610T	22.5	-21.0	-3.0	-0.6	-0.6	0.1

Notes

- Verify incision location.
- PCA is not included

Keratometer index: 1.3375

K1 8.04 mm, 42.0 D, 110.0°

K2 7.67 mm, 44.0 D, 20.0°

Axial length 23.5 mm (Optical)

ACD 3.25 mm

SIA 0.25 D x 100°

Pre Op Refraction

Target refraction

Surgeon name

Hospital/Clinic

-0.50 D

Mr Test Account

Test Clinic

IMPORTANT: For information only. Please ensure that the lens data above matches the confirmed IOL selection as calculated by Raytrace for this specific patient.

Version 3.0020.0.0



## CALCULATION RECORDS

Users can access information on all IOL calculations that were performed with their account under the 'Previous Patients' option. Users can revisit and recalculate lenses for the same patient, when selecting '**Continue**'. Users can revisit and view the lens that was submitted by selecting '**View**'.

It is possible to search for the required calculation based on the:

- Raytrace reference number
- Patient ID reference
- Hospital or Clinic name



ADD A NEW PATIENT

PREVIOUS PATIENTS

MANAGE ▾



Mr Test Account ▾

RAYTRACE NUMBER:	<input type="text"/>	PATIENT ID:	<input type="text"/>
HOSPITAL/CLINIC:	<input type="text"/>		
<input type="button" value="SEARCH"/>			

RAYTRACE NUMBER	CALCULATION DATE	PATIENT ID	SUBJECT EYE	HOSPITAL/CLINIC	SURGERY DATE	IOL TYPE	
208276	02 Oct 2020	Test	OS (left)	Test Clinic	-	RayOne Toric	View
208273	30 Sep 2020	Test	OS (left)	Test Clinic	-	RayOne Toric	<input type="button" value="CONTINUE"/>
208272	30 Sep 2020	Test	OS (left)	Test Clinic	-	RayOne Toric	View



## RAYTRACE FORMULA

Raytrace utilises a combination of regression formulas (Haigis, Hoffer Q, Holladay 1 and SRK/T) and applies the recommended formula based on the patient's biometry input.

## RAYTRACE DATA ENTRIES VALUE RANGES

The following table shows the defined ranges for the input values of the biometric data. Only values that are in the defined range can be entered on Raytrace.

Input field	Unit	Lower Limit	Upper Limit
Target Refraction	Diopetre	-10.00	10.00
Pre-op Sphere	Diopetre	-30	30
Pre-op Cylinder	Diopetre	-30	30
Pre-op Axis	Degrees	1	180
Anterior Chamber Depth (ACD)	mm	1.50	6.00
Axial Length (AL)	mm	15.00	40.00
K1	D/mm	18.38 D 5mm	63 D 18.37mm
K1 Degrees	Degrees	1	180
K2	D/mm	18.38 D 5mm	63 D 18.37mm
K2 Degrees	Degrees	1	180
Surgically Induced Astigmatism (SIA)	Diopetre	0	1.5
Incision Location	Degrees	0	359

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## TECHNICAL SUPPORT

Raytrace management falls within the Eye Science Department at Rayner.

Please email [eyescience@rayner.com](mailto:eyescience@rayner.com) for all technical support and enquiries related to:

- Raytrace
- Manual calculations
- Optimisation of constants
- Support with uploading optimised or manufacturer suggested constants
- Reported outcomes

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- Post, store, or transmit any information or material that could or does constitute a criminal offence or otherwise violate any laws;
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- Misuse any email function available on or through the Rayner Site.

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### **6. Access to Raytrace and User Obligations**

Access to our proprietary online calculator “Raytrace” and a licence to use the Raytrace software is available free of charge through the Rayner Site. Raytrace is provided for use by medical experts.

Raytrace calculates a non-binding recommendation for a Rayner intraocular lens suitable for the patient whose data has been entered in the calculator. In most instances the calculator will generate a number of lens options to best match the patient’s desired post-operative refractive outcome. The recommendation is not a substitute for the calculation of a customised lens performed by a medical expert, nor does it obviate the need for the user to exercise independent medical judgment. The Raytrace user must verify the recommendation against the biometric input data, the accuracy of which cannot be verified by Raytrace. Raytrace may identify atypical or invalid data but careful checking and verification of the data by a user is essential. Any warnings or advice notes generated by Raytrace must be carefully heeded by the user who has full responsibility for ultimate lens selection.

As a Raytrace user you accept unlimited liability for the accuracy of the data entered in Raytrace and for the practical implementation of any recommendation produced by Raytrace.

Once registered on the Raytrace system you become fully responsible for all access, use and activity on your account and with your password. You are solely responsible for maintaining the confidentiality of your account and password and you agree that you will not transfer your account or password, or permit either to be used by anyone who is not you, save with our prior consent.

When you order lenses via Raytrace you will be advised of our Conditions of Sale by which you will be bound once the order for a lens is placed. We shall not be obligated to fulfil any order on the basis of a recommendation generated by Raytrace.

## 7. Licence of Raytrace and Restrictions on Use

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- Any loss or damage suffered or incurred by a user and/or a patient arising from any recommendation generated by Raytrace and/or any access to and use of the calculator.
- Any failure by a user to enter accurate data, to verify any recommendation generated by Raytrace and to obtain prior consent to the entry of third party personal data.

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#### **14. Jurisdiction**

You choose to access and use the Rayner Site at your own risk. You are responsible for compliance with any local laws applicable to you.

These Terms and all contractual and other relationships which arise out of the Rayner Site are governed by the laws of England. You submit to the exclusive jurisdiction of the English Courts where any dispute arises out of or in connection with these Terms and/or your use of the Rayner Site.

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EC 2020-82 10/20