Hill-RBF Calculator Instructions for Use

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Preface
Thank you for choosing the Hill-RBF Calculator for IOL power selection prior to cataract surgery. Provided you carefully follow these instructions for use, the use of the calculator should be reliable and trouble-free.

WARNING!
Please read the instruction manual carefully before using this calculator. It contains important safety information for both the patient and the surgeon.

Intended use
The Hill-RBF Calculator is designed to assist the user in selecting the appropriate IOL power for cataract surgery when optical biometry is used to calculate the power of a biconvex intraocular lens (IOL) form +6.00D to +30.00D IOL power and for a meniscus IOL form -5.00D to +5.00D IOL power.

Safety

WARNING!
These signs must be strictly adhered to, to ensure safe operation of the instrument and to avoid endangering users and patients.

Patient population
The Hill-RBF Calculator is an advanced, self-validating method for IOL power selection employing pattern recognition and a sophisticated form of data interpolation. This method of IOL power selection performs well for short, normal and long eyes. Based in artificial intelligence, this methodology is entirely data driven and free of calculation bias. This approach also employs a validating boundary model, indicating to the user when it is performing within a defined area of accuracy.

IOL models and biometry devices supported
The Hill-RBF Calculator is meant to serve as an adjunct tool to assist physicians in selecting the appropriate IOL power for a particular patient. It is intended to be used in conjunction with a comprehensive ophthalmic examination and the appropriate diagnostic tests and measurements necessary for cataract surgery candidates. It was developed based on LENSTAR LS 900 biometry data in combination with the Alcon SN60WF IOL for IOL powers form +6.00 to +30.00 Diopters and with the Alcon MA60MA for IOL powers form -5.00 to +5.00 Diopters. It performs best with this combination of biometry device and IOL. It may also be used with other biconvex and meniscus IOL models within the power range of -5.00 to +30.00 dioptres. The switch in lens-design form biconvex to meniscus is at 5.00D, calculations form -5.00D to +5.00D are based on a meniscus lens design, calculations form +6.00D to +30.00D are based on a biconvex lens design.
WARNING!
Using other data sources or IOL models other than the SN60WF and MA60MA, may reduce the overall performance of the calculator. The Hill-RBF Calculator can only be used with biconvex IOL designs for IOL powers form +6.00D to +30.00D and meniscus IOL designs for IOL powers form -5.00D to +5.00D. For example, anterior chamber IOLs are often based on a convex-plano design and are therefore not suitable to be used in combination with the current release of the Hill-RBF Calculator.

Disclaimer
The results obtained by the Hill-RBF Calculator are not intended to serve as medical or surgical instruction, or be definitive; nor can it be guaranteed that the results will be accurate for every case. Physicians who use the calculator must arrive at their own independent determinations regarding the proper treatment of their patients and are solely responsible for the final post-operative refractive outcome. By using the Hill-RBF Calculator, the user agrees to waive all claims against and hold Warren E. Hill and Haag-Streit AG harmless from any claims arising out of your use of this tool.

Data safety
The use of this Calculator may involve the entry of certain confidential patient data, which may be deemed “protected health information” (“PHI”) under the Health Insurance Portability and Accountability Act of 1996 and Standards for Privacy of Individually Identifiable Health Information, 45 CFR Parts 160 & 164 (“HIPAA”) as amended, or supplemented by additional legislation or regulations from time to time. All information during transfer of the data from the original computer and the server is encrypted. The data provided is stored for the purpose of improving the performance of the Calculator and for ongoing research. All PHI data is encrypted using technology customary to the industry. Haag-Streit, as the provider of the Hill-RBF Calculator service, uses reasonable efforts to avoid unauthorized disclosure of data.

Supported web browsers
The Hill-RBF Calculator was tested on the following web browsers:
- Internet Explorer V. 11 (Microsoft)
- Edge (Microsoft) V. 25
- Firefox (Mozilla) V. 44
- Chrome (Google) V. 50
- Safari (Apple) V. 9
### Introduction

#### User interface

This chapter describes the use of the Hill-RBF Calculator step by step.

#### Patient data entry

As a first step, patient data must be entered. This area allows the user to identify the patient for which the calculation is to be carried out.

#### Surgeon data entry

Select the target refraction for the right (OD) and the left (OS) eye. In the current release of the Hill-RBF Calculator, target refraction values form -2.50D to +1.00D are supported.

#### Operation

This chapter describes the use of the Hill-RBF Calculator step by step.

### Patient data entry

The fields for ID and patient's name (family name) are mandatory entries. The patient’s first name and date of birth are optional entries. Clicking on the calendar icon next to the date of birth field opens a calendar tool that allows for the easy section of the correct date of birth.

### Surgeon date entry

With the current release, all fields in the surgeon data entry section are optional.

Data entered in the surgeon entry section will be visible on the printout and this area allows for easy identification of the surgeon.
In a future release, this data will be used to remind the user to provide stable post-operative refraction data for a respective patient. This information is anonymized and will be used as part of an ongoing process to improve the performance of the Hill-RBF Calculator.

**Biometry data entry**

Entering biometry data is divided into two steps. First, the user selects the biometry device used to acquire the measurement data. Afterwards, the following biometry values are entered: Axial length (AL), anterior chamber depth (ACD) and keratometry (flat (K1) and steep (K2) keratometry values and their corresponding meridians in degrees). All other fields are optional with the current release.

![Biometry data entry screenshot](image)

Even though only the above mentioned fields are necessary to calculate IOL power with the current release of the Hill-RBF Calculator, it is recommended that all data available be entered to allow for improved accuracy of the calculator in future releases.

**WARNING!**
The Hill-RBF Calculator was developed based on LENSTAR LS 900 biometry data in combination with the Alcon SN60WF for IOL powers form +6.00D to +30.00D IOL powers and with the Alcon MA60MA for IOL powers form -5.00D to +5.00D. It performs best with this combination of biometry device and IOLs. Using other types of biometry, or IOL models, may reduce the overall performance of the calculator. With the current release, the calculator accepts input data from the following optical biometers: Lenstar LS 900, IOLMaster 500, IOLMaster 700, AL-Scan, Aladdin and Pentacam AXL.

**Selection of the target refraction**

Select your desired spherical equivalent target refraction. With the current version of the calculator values form +1.00 to -2.5D are accepted.

**IOL data entry**

Enter the IOL manufacturer’s name as well as the specific model name in their respective entry fields. Then add the A-constant for the SRK/T formula optimised for optical biometry in the A-Constant field.

![IOL data entry screenshot](image)

Even though only the A-Constant field is mandatory, entering all data will help to improve the performance of the calculator.

**WARNING!**
The Hill-RBF Calculator was developed based on LENSTAR LS 900 biometry data in combination with the Alcon SN60WF IOL for IOL powers form +6.0D to +30.0D and with the Alcon MA60MA for IOL powers form -5.00D to +5.00D. It performs best with this combination of biometry device and IOL. Using other IOL models, may reduce the overall performance of the calculator.

**Preforming the IOL calculation**

After all mandatory data is entered, the calculation button at the bottom is enabled. Clicking on this button will display the IOL calculation result. The Hill-RBF calculator is self-validating, which means that an IOL power will be displayed only if the pre-operative data is within the calculator boundary model. If the pre-operative data is outside the calculator boundary model, a warning message will be displayed instead of an IOL calculation result. If a warning message appears, it is recommended to instead use latest generation IOL calculation formulas, such as the Barrett Universal II formula, or the Olsen formula.
Printing the calculation result
To print the calculation, click on the printer icon as described in the introduction. A 2nd browser window will open, providing a PDF printout of the results for documentation purposes.

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Introduction
The Hill-RBF Calculator is an advanced, self-validating method for IOL power selection employing pattern recognition and a sophisticated form of data interpolation. It has been optimized for use with biometry data from the Haag-Streit LENSTAR LS 900 optical biometer in combination with the Alcon SN60WF biconvex intraocular lens (IOL) for IOL powers form +6.00D to +30.00D and with the Alcon MA60MA for IOL powers form -5.00D to +5.00D. The Hill-RBF on-line calculator may also be used with data from other optical biometers, which provide clinically equivalent biometry data as compared to the LENSTAR LS 900. It may also be used with other biconvex IOL models in the power range of +6.00D to +30.00D and other meniscus IOL models in the power range of -5.00D to +5.00D. WARNING: Using other data sources, or IOL models other than the original ones used to develop the Hill-RBF Calculator, may reduce the overall performance of the calculator.

Disclaimer
The Hill-RBF Calculator is meant to serve as an adjunct tool to assist physicians in selecting the appropriate IOL power for a particular patient. It is intended to be used in conjunction with a comprehensive ophthalmic examination and the appropriate diagnostic tests and measurements necessary for cataract surgery candidates. It was developed based on LENSTAR LS 900 biometry data in combination with the Alcon SN60WF and the Alcon MA60MA IOL. It performs best with this combination of biometry device and IOL. It may also be used with other biconvex IOL models in the power range of +6.00D to +30.00D and other meniscus IOL Models in the power range of -5.00D to +5.00D. WARNING: Using other data sources or IOL models than the original ones the model was derived on, may reduce the overall performance of the calculator. The results obtained by the calculator are not intended to serve as medical or surgical instruction, or be definitive; nor can it be guaranteed that the results will be accurate in every case. Physicians who use the calculator must arrive at their own independent determinations regarding the proper treatment for their patients and are solely responsible for the refractive outcome. By using the Hill-RBF Calculator, the user agrees to waive all claims against and hold Warren E. Hill and Haag-Streit AG harmless from any claims arising out of your use of this tool.

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