Eyesi Slit Lamp

High-End Virtual Reality Simulator for Training of Eye Examinations
Eyesi® Slit Lamp is a virtual reality simulator for training of eye examinations. Using the embedded curriculum, trainee ophthalmologists and optometrists can practice both the complex handling of a slit lamp and recognition of relevant clinical manifestations – without the need for real patients.

- Real-time simulation of anatomical structures and microscopic visualization
- True to original BQ 900 hardware
- Examination of virtual patients with microscope, fundoscopy lens and gonioscopy lens*
- Embedded curriculum with more than 150 virtual patients
- Direct performance feedback and objective assessment

*see release schedule for availability
All Functions of a Real Slit Lamp
Integrated in the hardware of the slit lamp model BQ 900 from Haag-Streit Diagnostics, the simulator provides the same controls as a real slit lamp. All optical effects visible in a real slit lamp are realistically reproduced by the simulator. This allows for a life-like examination of virtual patients with various ophthalmological conditions. In addition to the microscope, Eyesi Slit Lamp will feature a 90D lens to inspect the posterior segment of the eye as well as a gonioscope simulator for inspection of the iridocorneal angle.

Case-Based Curriculum for Self-Guided Training
With a case database of more than 150 virtual patients, Eyesi Slit Lamp allows trainees to experience a wide range of clinically relevant pictures. The embedded curriculum offers training with increasing level of difficulty – from basic device operations and illumination techniques through to recognition and classification of pathologies and diagnosis of complex clinical cases.

Feedback and Assessment
At the end of each virtual examination, trainees are presented with a detailed evaluation of their performance. All training data is stored in a central database for further analysis. Both trainees and educators can access the individual training status through the web-based VRmNet portal.
The Eyesi Slit Lamp simulator offers a standardized curriculum for training of ophthalmologists and optometrists, and self-guided learning at an individual pace. The embedded, didactically structured training program consists of four tiers of ascending levels of difficulty. Trainees proceed through the curriculum by successfully completing the tasks of a tier. Educators can lock or unlock tiers as required.

**Tier A  Operation and Illumination Techniques**

Tier A of the Eyesi Slit Lamp curriculum consists of simple, abstract tasks for practicing basic device operations and illumination techniques. Visual cues provide step-by-step guidance when trainees explore the function and effect of the Slit Lamp controls, such as control lever, rotation arms, adjustment screws, or filters.

1. Task tier A, “Follow the lid margin by using the XYZ control lever while keeping the lid in focus.”

2. Task tier A, “Find symbols on the corneal endothelium visible only when the endothelium is in focus.”

**Tier B  Visualizing the Healthy Eye**

In tier B, trainees are asked to use the slit lamp to visualize specific anatomical structures. They are presented with variations of normal eyes such as different iris pigmentations, retina pigmentations or chamber angle structures.

**Tier C  Grading and Classification**

In tier C, standard grading and classification schemes are introduced and trainees practice the detailed assessment of diagnostic findings. For this purpose, more than 50 virtual patients are available, presenting with pathologies of the anterior segment, posterior segment, and chamber angle.

**Tier D  Clinical Cases**

For training of more complex examinations and diagnosing, Eyesi Slit Lamp provides around 100 virtual patients with complete case histories. The cases have been developed in close cooperation with university eye clinics.
1 Simulation of a case of keratoconus

2 Task tier B, examining healthy eye structures,
   “Place a crosshair onto a Meibomian gland”

3 Multiple-choice questionnaire on a case of keratoconus

Please answer the following question:
What are the typical symptoms of Keratoconus?

- [ ] Ocular irritation due to dryness.
- [ ] Monocular polyopia: perception of multiple ghost images.
- [ ] History of frequent changes in eye glasses, which do not adequately correct vision.
- [ ] Asymmetric refractive error with high or progressive astigmatism.
- [ ] Progressively poor vision, not easily corrected with eye glasses.
- [ ] Pain and photophobia.
More Than 150 Virtual Patients
Gaining Experience – Independent of Patient Flow

Tier C  Grading and Classification

Anterior Segment
- Anterior uveitis
- Conjunctival injections
- Trachoma
- Cataract
- Corneal neovascularization

Posterior Segment
- Hypertension
- Optic disc
- Age-related macular degeneration
- Diabetes
- Vascular occlusions

Chamber Angle
- Van Hericks method

Tier D  Clinical Cases (Examples)

Lids & Lashes
- Molluscum contagiosum
- Blepharitis anterior
- Chalazion
- Cyst of Moll
- Cyst of Zeiss
- Trichiasis
- Distichiasis
- Ectropion
- Entropion

Conjunctiva
- Vernal conjunctivitis
- Molluscum contagiosum
- Pterygium

Cornea
- Corneal neovascularization
- Herpes simplex keratitis
- Crocodile shagreen
- Bullous keratopathy
- Keratoglobus
- Keratoconus
- Corneal dellen
- Fuchs’ dystrophy

Glaucoma
- Primary angle closure, pupillary block
- Pigmentary glaucoma
- Pseudoexfoliation glaucoma
- Seclusio pupillae
- Neovascular glaucoma

Retina
- Myelinated nerve fibers
- Retinopathy pigmentosa
- Toxoplasmosis
- Syphilis
- Age-related macular degeneration (dry and wet)
- Macular hole
- Choroidal rupture
- Valsalva retinopathy
- Chorioretinal metastasis
- Chorioretinal melanoma
- Choroidal neovascularization
- Vasculitis
- Proliferative vitreoretinopathy
All Eyes Slit Lamp pathologies can be examined with the microscope as well as with the fundoscopy and gonioscopy lenses and show appropriate findings.
The Eyesi Slit Lamp simulator offers guidance and feedback to support trainee eye specialists in their learning process. The computer-based training system allows for a detailed evaluation of both device operation and diagnoses. The competency-based assessment fosters trainees’ confidence and provides a significant reference for educators.

**Immediate Feedback**

At the end of each virtual examination, Eyesi Slit Lamp presents trainees with a detailed evaluation of their examination and diagnostic performance. Scored parameters include the examination time, the light exposure, the completeness of findings and accuracy of the diagnosis, for example. The immediate, objective feedback allows trainees to improve their skills systematically.

**Performance Standards**

In order to ensure performance standards, trainees may only proceed through the curriculum after they have reach a defined performance level, indicated in their scoring points. All training data is stored in the simulator’s database. Both trainees and educators can access the training status for further review.
VRmNet® is a web-based service for networked VRmagic training simulators. The VRmNet portal offers convenient administration features for educators and a personal training dashboard for trainees. The VRmNet service features are complemented by online service and automatic software updates.

**Administration and Monitoring**
Educators can use VRmNet to comfortably set up users and manage classes from any computer or mobile device. The VRmNet database allows educators to monitor and review their trainees’ training progress.

**Dashboard for Trainees: Self-Guided Learning**
Trainees can log in into their personal VRmNet dashboard to access an overview of their current training status. A personal medical findings library allows for self-reliant recap of learning content.

**Online Orientation on Simulator Training**
In order to prepare trainees for their first practical training session, VRmNet provides an online orientation with short step-by-step videos on simulator handling and courseware features.

**Medical Online Courses**
Medical online courses available on VRmNet extend the practical training with Eyesi Slit Lamp: Didactically structured background information is enriched with videos, images, and multiple-choice tests.
Trainees can access their personal findings library online for recap of learning content.

VRmNet offers a step-by-step online orientation on training with Eyesi Slit Lamp.

Medical online courses available on VRmNet contain multimedia content and multiple-choice tests.

**Moving and Focusing the Light Beam**

- Look through the microscope and move the complete slit lamp base until the slit is approximately focused on the cornea.
- Fine tune focus and position of the light beam by tilting the control lever.
- Adjust the vertical position of the light beam by rotating the control lever.

**Multiple-Choice Test**

This test consists of 3 questions. Answer all questions correctly to complete this section.

Which corneal types are shown in the following picture? Please drag the labels to the correct positions in the image.

- Nuclear
- Posterior subcapsular
- Cortical

What is the name of the corneal grading system you will use on the Eyesi Slit Lamp?

- Clinical Corneal Classification and Grading System
- Lens Opacities Classification System II
- Lens Opacities Classification System III
- Oxford Clinical Corneal Classification and Grading System