



# Earsi Otoscope Simulator



High-End Virtual Reality Simulator for Training of Ear Examinations



# Introducing High-Fidelity Otoscopy Training

The First Virtual Reality Simulator for Teaching the Diagnostic Skill of Otoscopy



Components of the Earsi Otoscope (from left to right): touch screen, patient model ear, otoscope handpiece, simulator PC.

## Lifelike Ear Examinations

Earsi Otoscope is a virtual reality training simulator for ear examinations using the otoscope. Equipped with a lifelike model ear and otoscope handpiece, the Earsi Otoscope allows for realistic ear exams including pinna pull and pencil grip of the otoscope, fostering correct examination techniques. When trainees look into the model ear through the otoscope, they see a lifelike representation of the ear canal, eardrum, and middle ear. An objective performance feedback helps teachers to properly judge their students' skill level.

## Self-Guided Training with a Detailed 3D Model

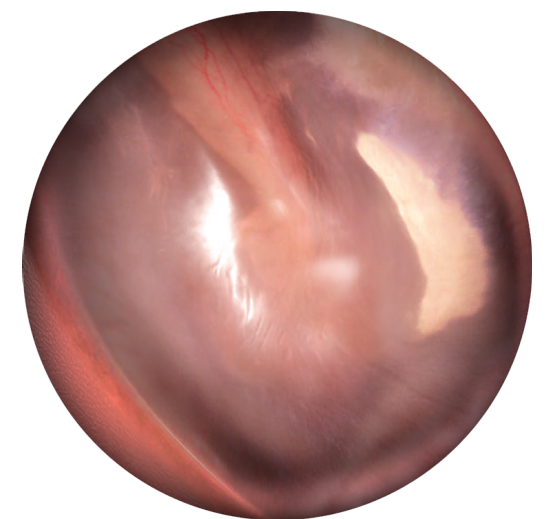
The use of virtual reality can ensure hundreds of adult learners receive a standardized, clinically diverse otoscopy training. The Earsi Otoscope simulator is both able to yield proficiency data and be deployed within a medical school's curriculum without additional time allotments being made. It offers a complete and detailed 3D model of the external and middle ear, a ready-to-go curriculum, and an immersive training experience that is unprecedented in otology.

## Improved Otoscopy Training

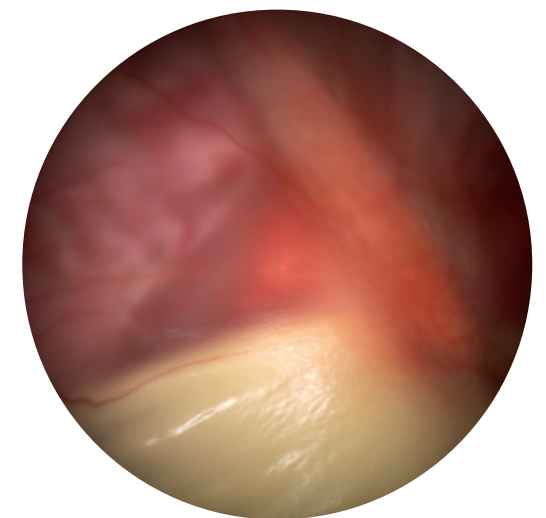
The Earsi Otoscope Simulator makes it possible to teach clinical skills better while respecting the ever increasing curriculum time pressure medical schools have to deal with today. All students are presented with a comparable clinical learning experience, and educators can ensure that students have gained a certain level of clinical proficiency after training.

### Contact VRmagic

VRmagic invites you to see how the Earsi Otoscope simulator can help medical schools deliver a higher quality of training to its medical students. Feel free to contact us: [info@vrmagic.com](mailto:info@vrmagic.com).



Highly realistic anatomy as students see it in the Earsi Otoscope. This example shows a tympanic membrane with calcified deposits (tympanosclerosis).



Trainees can examine different stages of pathologies, for example of acute otitis media. Here, the stage of suppurative effusion with purulent effusion can be seen.



# Teach Diagnosis of the Most Common Pathologies

Achieving Diagnostic Proficiency in a Lifelike Environment

### Available Pathologies

- Healthy ears
- Acute diffuse otitis externa
- Acute localized otitis externa (furuncle)
- Acute otitis media
- Barotrauma
- Cerumen impaction
- Primary & secondary cholesteatomas
- Chronic suppurative otitis media
- EAC osteoma
- Exostosis (surfer’s ear)
- Foreign bodies
- Middle ear glomus tumor
- Otitis media with effusion
- Otomycosis
- Ramsay Hunt syndrome
- Tympanosclerosis
- Ventilation tubes

### Efficient Learning through a Realistic Examination

Traditionally, students learn about ear diseases from text books and pictures. With Earsi, trainees can go through the physical examination procedure until they are proficient. Light reflections and depth perception combined with the haptic experience provide for a realistic ear examination.

### New Ways of Looking at the Ear

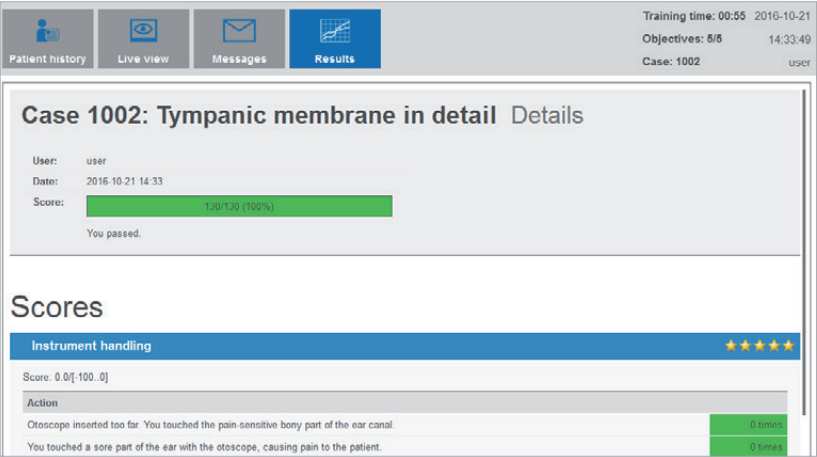
The virtual reality simulation with its natural, highly detailed anatomy opens up new ways of looking at the ear: For example, students can fade out the tympanic membrane to see and understand the middle ear structures. For a better illustration of learning goals, Earsi offers highlighted and animated findings during the examination.

### Independent Practice with a Case-Based Approach

Earsi uses a case-based approach to teach diagnostic skills. Introductory cases for basic motor skills training are followed by cases where different patients present with common pathologies. This ensures that trainees possess a defined level of knowledge after the training. Students are better prepared and feel more confident when examining their first patient.

### Objective Performance Feedback

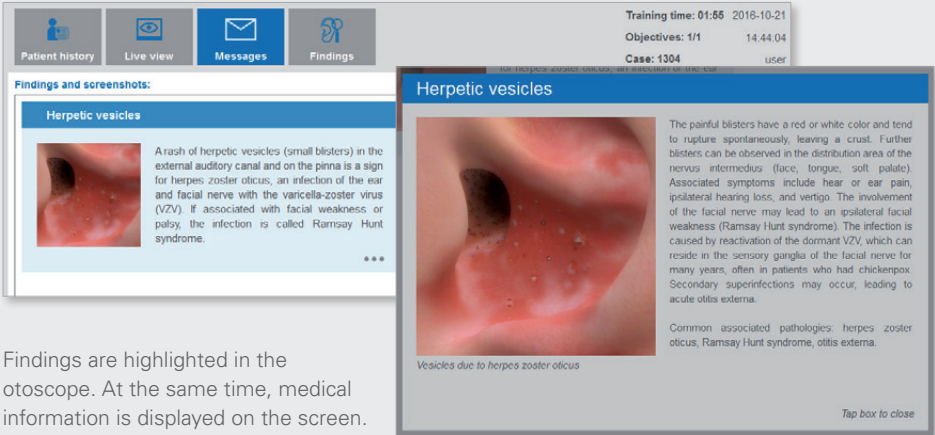
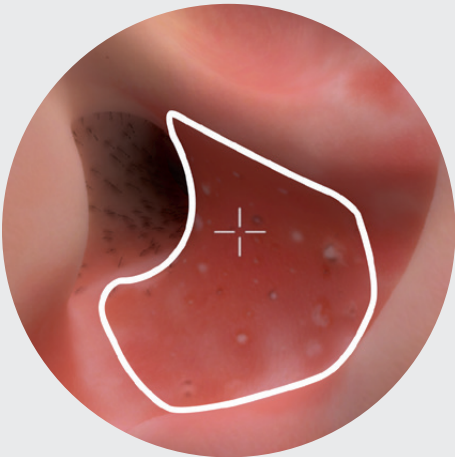
The simulator provides an evaluation directly after each exam and allows for “deliberate practice”: frequent practice at a suitable level of challenge with an immediate, objective feedback. The evaluation is based on otoscope handling, found pathological signs, wrong or correct diagnoses, and many other parameters. This feedback enables students to improve their skills systematically.



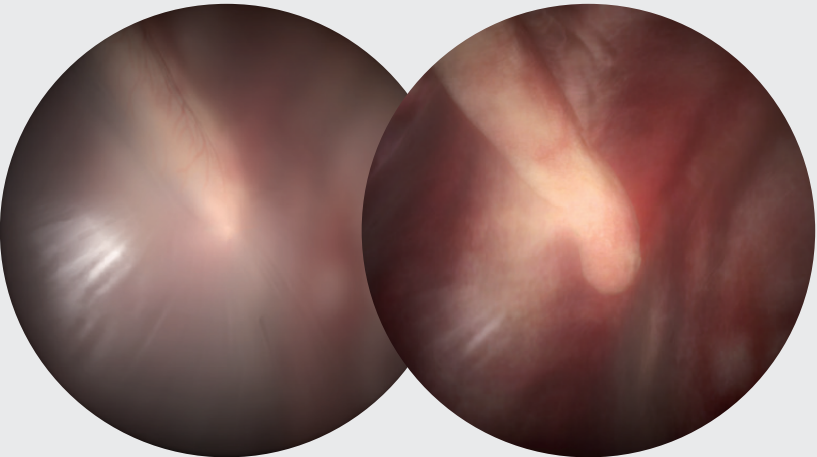
Detail of the result screen displayed after each examination



The student’s view into the Earsi Otoscope



Findings are highlighted in the otoscope. At the same time, medical information is displayed on the screen.



Left: These examples show a healthy ear. Trainees can fade out the tympanic membrane to reveal the middle ear structures – a unique feature of the Earsi Otoscope.





# Earsi Courseware – The Built-In Curriculum

Quality Assured Education – Pre-Installed and Ready-to-Go

## Training Curriculum for Self-Guided Learning

Earsi Otoscope comes with a structured curriculum that is ready to use on day one. The curriculum consists of three courses, each consisting of several cases. Students advance through the curriculum independently and self-guided by completing the cases of a course. Educators can keep track of their students’ progress and lock or unlock courses as required.

## A, B, C: From Otoscope Handling to Diagnosis

Course A concentrates on the anatomy of healthy ears. Course B teaches pathological signs and provides students with medical background information on every found sign. In course C, signs have to be detected without help, and findings and diagnoses must be specified correctly.

## Guidance and Medical Content for Students

When a trainee sees an anatomical feature in course A or detects a pathological sign in course B, it is highlighted in the otoscope, and a brief description is shown on the touch screen. The trainee can tap the description to view additional medical information. All detected findings are stored in the trainee’s personal findings library for future reference.

### A The Healthy Ear

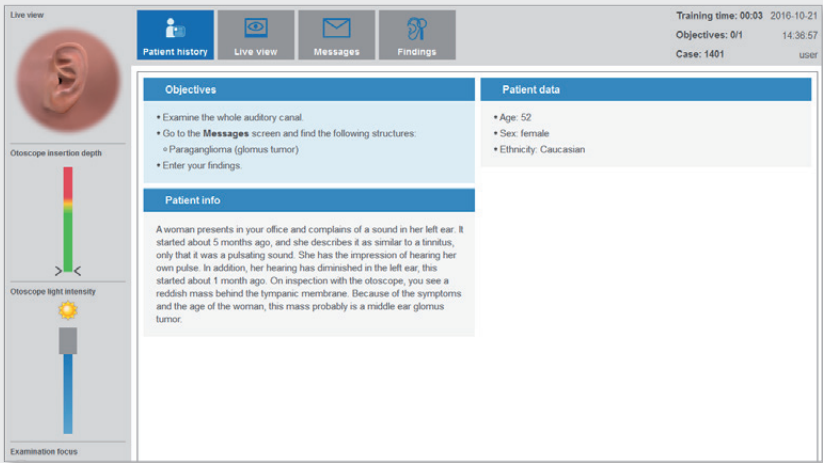
Basic understanding of the otoscope and the anatomy of the ear, motor skill training

### B Findings and Diagnoses

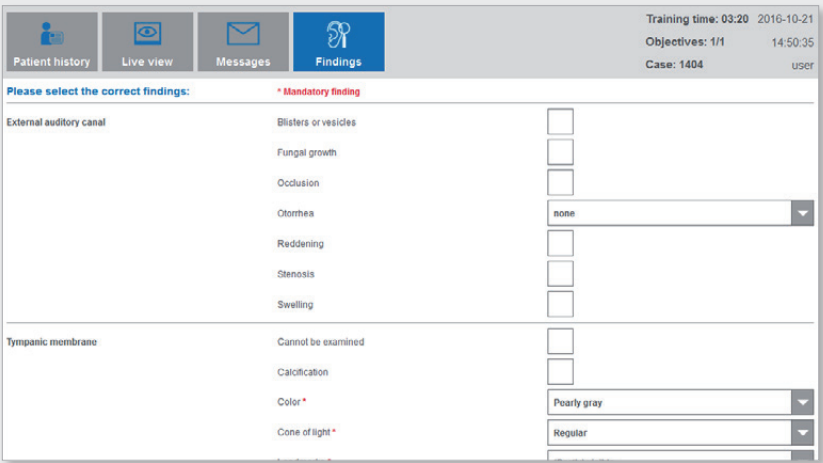
Introduction to important findings of common pathologies in different stages

### C Findings and Diagnoses (Quiz)

Recognition of common pathological findings and specification of diagnoses.



The touch screen user interface is clear and intuitive. Each case contains patient information and instructions on the current case.



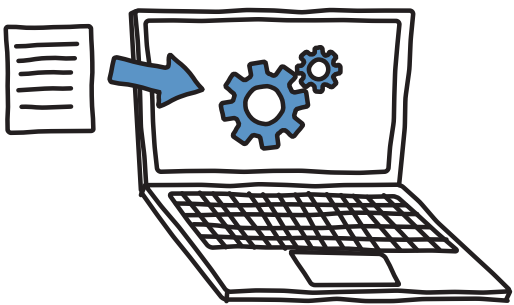
Findings and diagnoses are entered using multiple-choice input forms. Correct, wrong, or missing items are shown on the result screen after the examination.



# Teaching Large Classes Has Never Been Easier

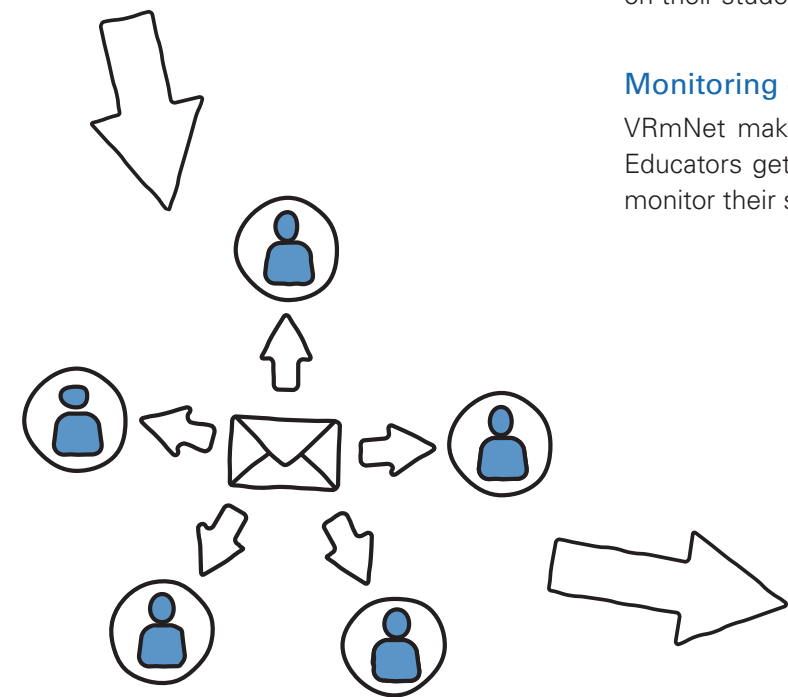
Web-Based User Administration and Online Training History

## VRmNet in a Nutshell



### #1 Automatic User Creation

You can create user accounts with only a few clicks. All you need to do is upload a list with names.



### #2 Automatic Email

An automatic email with an individual user account and a link to the VRmNet website is sent to each student.

## VRmNet – The New Web-Based Training Portal

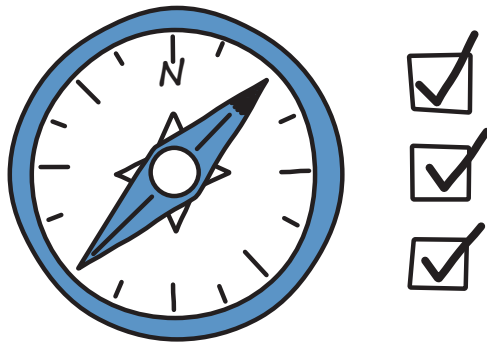
VRmNet is a new web-based training portal from VRmagic. Through the networking feature of VRmagic’s simulators, all user and training data can be stored on a central server and securely accessed via any PC or mobile device 24/7. Students log in into VRmNet to access an online orientation course, their training history, and medical content. Educators can use VRmNet to comfortably set up users, manage courses, and monitor their students’ training progress.

### Comfortable Administration

Educators can manage their classes easily. Creating and distributing user accounts for students can be done online within a few minutes. As soon as students have received their user accounts via an automatic email, they can start training. Additionally, automatic reports and notifications on important milestones keep educators informed on their students’ progress.

### Monitoring of Training Data

VRmNet makes access to training data both simple and powerful. Educators get an overview of their classes’ training history and can monitor their students’ individual progress.



### #3 Online Orientation

Trainees log in to the VRmNet website and complete an online orientation to activate their user accounts for simulator access.

# VRmNet

## Continuous Training through Data Synchronization

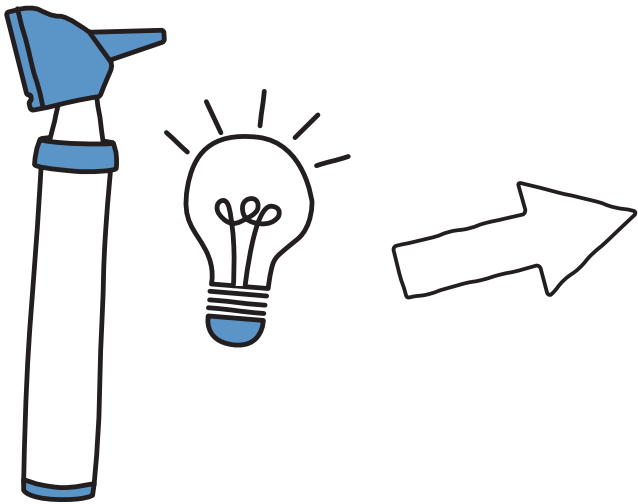
By networking all simulators of an institution through the VRmnet platform, training data is synchronized between devices. Students can continue their training on any connected simulator at any time.

### Online Orientation and Medical Content for Students

To prepare students for their first training session, VRmNet provides an online orientation with short videos on simulator handling and courseware features for self-guided training. Students also have access to their training history and medical content from any browser.

### Automatic Software Updates

The simulator software undergoes continuous enhancement. To ensure that trainees always benefit from the latest developments, the simulators connected to VRmNet are kept up to date with automatic software updates.



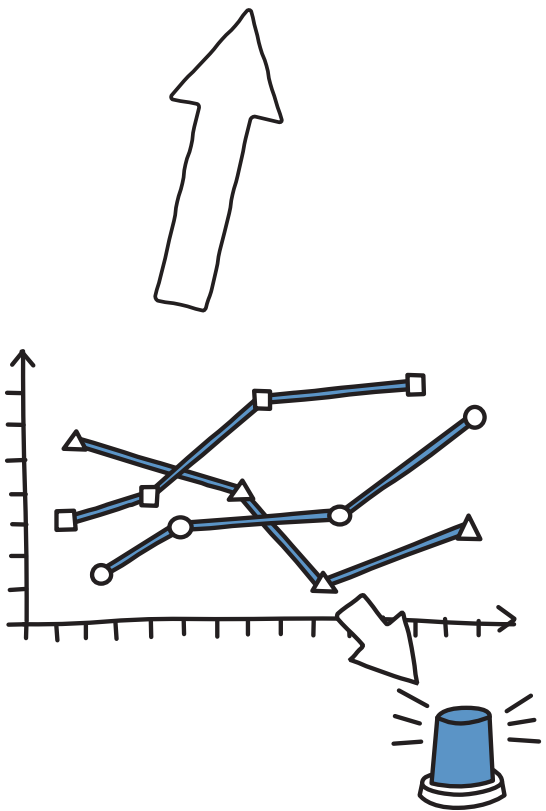
### #4 Independent Practice

Trainees start training independently and receive immediate, objective feedback on their performance.



### #6 Certificate and Assessment

Students automatically receive a certificate after completion, and can view an objective assessment of their skills.



### #5 Monitoring and Notifications

You can monitor your students’ training progress online. Configurable notifications and reports keep you informed on important milestones.





# Reasons for the Earsi Otoscope

The Most Sophisticated Otoscopy Simulator – For a Reason

## 1 Highly Realistic Training

Equipped with a lifelike model ear and otoscope handpiece, the simulator allows for realistic exams including pinna pull and pencil grip. The virtual reality offers a highly immersive experience. Trainees learn to identify pathological findings reliably using correct otoscopy techniques – without risk to patients and independent of the patient flow.

## 2 Self-Guided Practice

The diagnostic skill of otoscopy can only be gained through intense practice. At the same time, teaching time is an ongoing cost. The Earsi Otoscope simulator helps to solve this problem and allows medical students to practice on the pre-installed curriculum independently until they feel confident using the otoscope.

## 3 Objective Assessment

The Earsi Otoscope provides objective and immediate feedback after each virtual exam, so that students can systematically improve their skills. Educators can keep track of their students' training progress and skill level as they advance through the curriculum.

## 4 Built-In Training Curriculum

The curriculum contains the most common ear pathologies every medical student must be able to recognize, from exostosis to different stages of otitis media. Exposure to pathologies in different stages fosters a solid foundation of how to diagnose specific pathologies. This is difficult to achieve when training on healthy fellow students.

## 5 Online Teaching Solution with VRmNet

The online features of VRmNet help you to teach large groups of students efficiently. Manage user accounts with the web-based user administration, get students up to speed quickly using the online orientation, and have their training progress always at your fingertips via a user-friendly web interface.

### Test-Drive the Earsi Otoscope

Try out the Earsi Otoscope live at the next conference. Visit [www.vrmagic.com](http://www.vrmagic.com) for an overview of the upcoming events, or contact us by email or phone.





For more information on the Earsi Otoscope simulator or on the Eyesi Ophthalmic simulators, please feel free to contact us.



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