



# EARSI OTOSCOPE

## Training Simulator for Ear Examinations

**Tradition and innovation** – Since 1858, visionary thinking and a fascination with technology have guided us to develop innovative products of outstanding reliability: anticipating trends to improve the quality of life.



# Earsi Otoscope Virtual Reality Simulator for Training of Otoscopy

Earsi Otoscope is a virtual reality simulator for training of ear examinations. The otoscope simulator is handled the same way as its real counterpart. Looking through the otoscope into the model ear, trainees see a lifelike, three-dimensional representation of the external and middle ear simulated in real-time.

## DIFFERENT STAGES OF PATHOLOGIES

### Expertise Comes from Experience

Earsi Otoscope offers students the opportunity to practice examinations of the ear independent of patient flow and hospital routine. In addition to examination training, Earsi Otoscope provides trainees with the medical knowledge needed to reliably identify pathological findings. Systematic exposure to different stages of clinically relevant pathologies allows students to gain experience before examining their first real patient.

## EASY ADMINISTRATION

### Teaching Large Classes

By providing a didactically structured curriculum for self-guided training and objective assessment, Earsi Otoscope offers educators a solution for ensuring a standardized training experience for all of their students. In addition, online tools available on the VRmNet web portal make administration and monitoring of students' training status easy – even when teaching large classes.



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## Lifelike Training Environment

Equipped with a lifelike model ear and otoscope hand-piece, Earsi Otoscope allows for realistic practice of ear examinations, including pencil grip and pinna pull.

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## Standardized Curriculum for Self-Guided Learning

The case database of Earsi Otoscope contains healthy ears and common pathologies. With a didactically structured curriculum, the simulator offers a standardized method for self-guided training.

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## Evidence-based Assessment

Earsi Otoscope provides both trainees and educators with an objective performance assessment. Guidance elements and immediate feedback after each case help trainees to systematically improve their skills.

## Lifelike Environment Realistic Training of Ear Examinations

Equipped with a lifelike model ear and otoscope handpiece, Earsi Otoscope allows for realistic training of correct examination techniques, including pinna pull and pencil grip of the otoscope. The otoscope handpiece of the simulator features a built-in display showing the simulation. The touch screen displays the user interface with patient information, otoscope settings menu and a live view of the examination.

HIGH-END VIRTUAL REALITY

### Immersive Experience

Looking through the otoscope into the model ear, trainees see a lifelike three-dimensional representation of the ear canal, eardrum, and middle ear simulated in real-time. Light reflections and depth perception combined with the haptic experience provide for a realistic examination experience.



LIFELIKE OTOSCOPE

## Device Handling

For examining a virtual patient on the Earsi Otoscope simulator, the pinna of the model ear can be pulled slightly to straighten the ear canal. As trainees look through the otoscope and insert it into the ear, they see a dynamic, three-dimensional representation of the auditory canal, tympanic membrane, and middle ear.

LIGHT INTENSITY AND EXAMINATION FOCUS

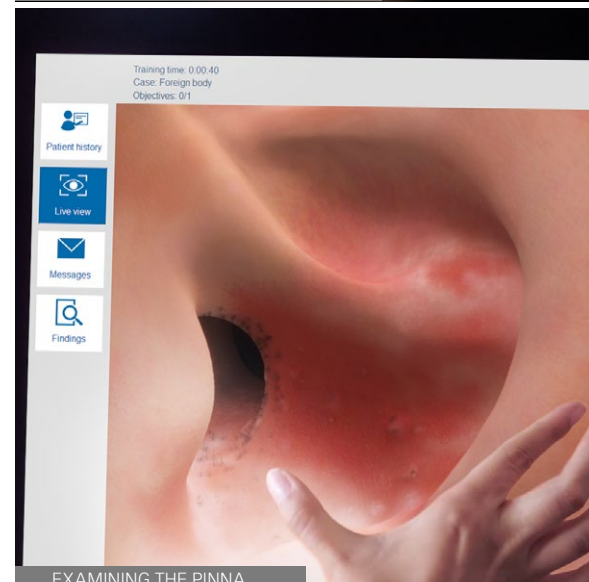
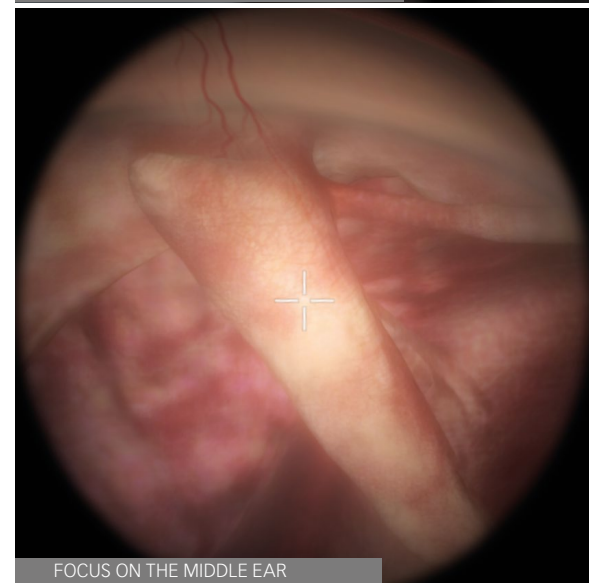
## Otoscope Settings

Trainees can adjust the light intensity of the otoscope using a slider on the user interface menu. In some cases, they can also choose between setting the examination focus on the external ear or the middle ear. When choosing the middle ear, the tympanic membrane is faded out, offering an unobstructed view of the middle ear structures not possible in real examinations.

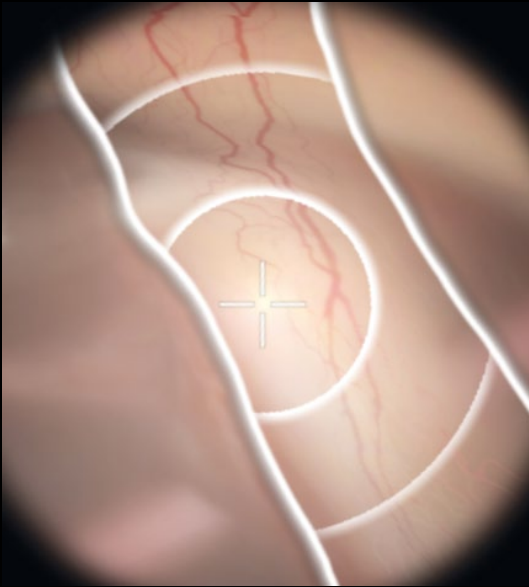
TOUCH SCREEN

## Examining the Pinna

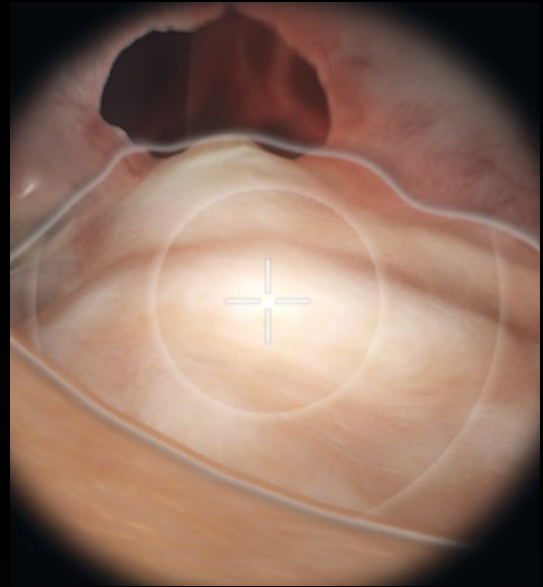
In cases with pathologies apparent on the pinna, such as herpes zoster oticus, or otitis externa, the pinna can be displayed on the touch screen. By swiping and pinching, trainees can examine the pinna from all directions and zoom in or out.







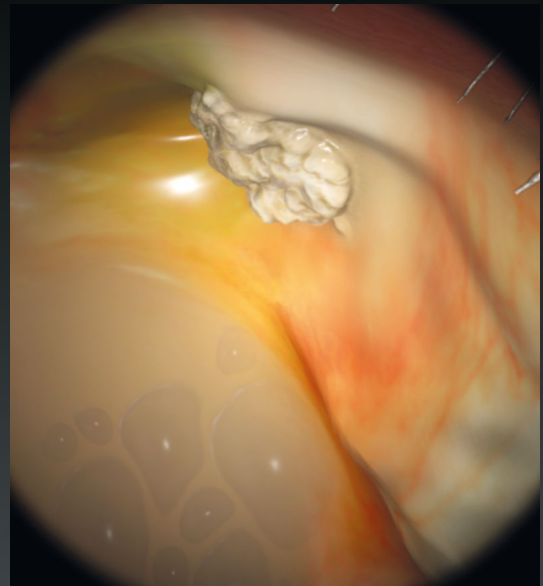
COURSE A: THE HEALTHY EAR



COURSE B: FINDINGS AND DIAGNOSES (LEARNING MODE)



COURSE C: FINDINGS AND DIAGNOSES (EXAM MODE)



COURSE C: FINDINGS AND DIAGNOSES (EXAM MODE)

A, B, C: From Otoscope  
Handling to Diagnosis

# Earsi Otoscope Courseware Curriculum for Self-Guided Learning

Simulator-based training allows for a standardized learning experience and ensures that all students reach the same level of clinical proficiency. With a ready-to-go courseware, the Earsi Otoscope simulator can easily be integrated into educational programs.

## STANDARDIZED CURRICULUM

### Ready-to-Go Courseware

The Earsi Otoscope simulator comes with an embedded, didactically structured curriculum, which has been designed to teach recognition of the most common pathologies within only a few hours. Students advance through the curriculum independently and self-guided. Educators can lock or unlock courses as required.

## CASE-BASED APPROACH

### Database of Virtual Patients

The Earsi Otoscope curriculum uses a case-based approach to teach diagnostic skills. The curriculum consists of three courses, each containing several cases. Introductory cases on ear anatomy are followed by cases with pathologies in different stages. Patients of varying gender, age, and ethnicity present with common pathologies, such as otitis media, tympanoclerosis, otomycosis, or cholesteatoma.

## OVERVIEW

### Earsi Otoscope Courseware

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#### Course A: The Healthy Ear

Course A offers introductory cases with healthy ears. Students practice handling of the otoscope, train their motor skills, and become familiar with the outer and middle ear anatomy.

#### Course B: Findings and Diagnoses (Learning Mode)

Course B offers a variety of cases with pathological ears. Trainees learn to examine the ear thoroughly and get to know important signs of common pathologies. As trainees progress, they build up a library of information on common pathological findings..

#### Course C: Findings and Diagnoses (Exam Mode)

Course C offers a variety of cases with pathological ears. Students will consolidate the knowledge acquired in course B as they practice documenting and diagnosing pathologies without any hints from the simulator.

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# Earsi Otoscope

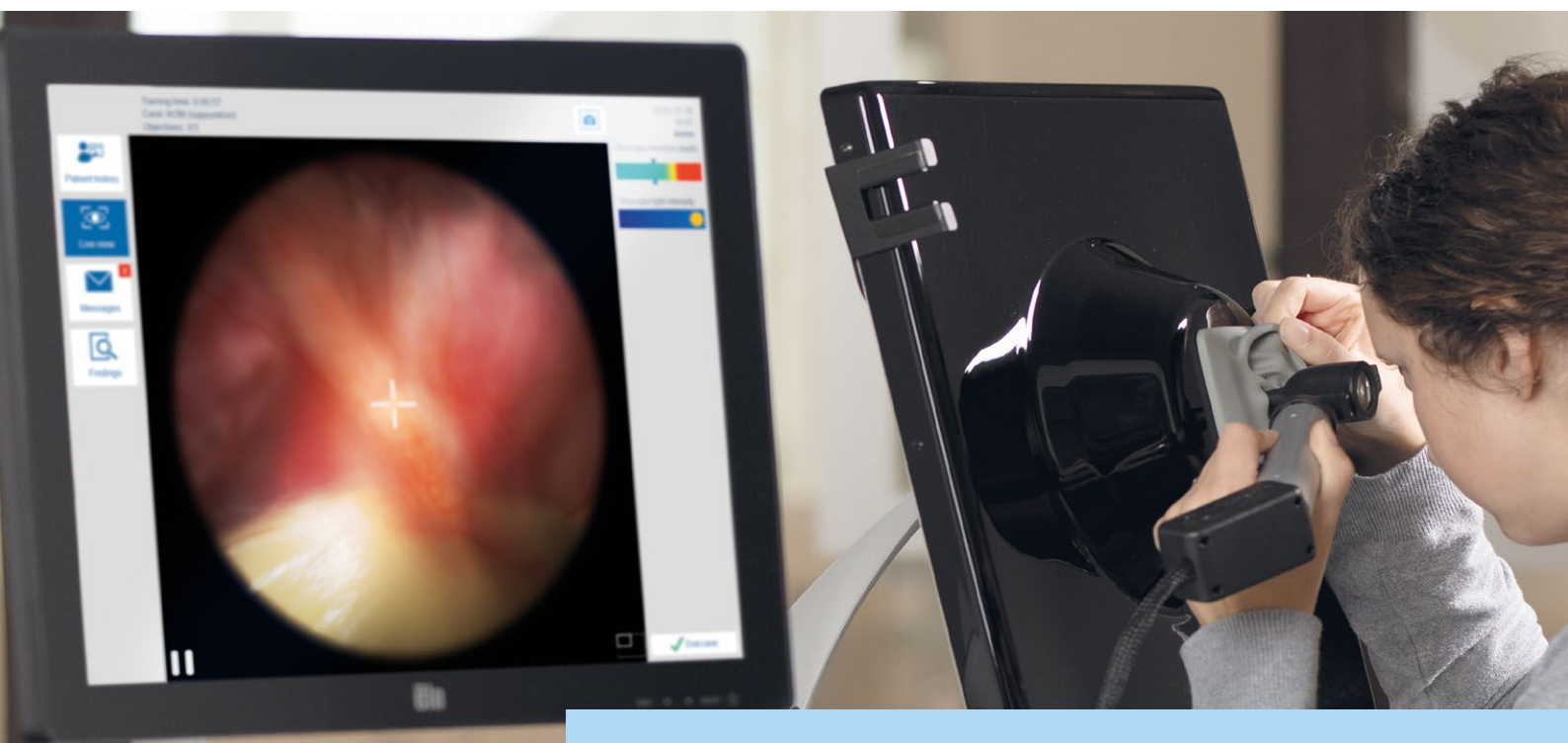
## Feedback & Assessment

Earsi Otoscope offers an interactive training environment that provides immediate performance feedback. The training system supports beginners in their learning process by providing educational guidance elements. Additional medical background information deepens the understanding of anatomical and pathological characteristics. A personal findings library, which is also accessible on the VRmNet web portal, allows students to recap their learning matter.

### PERFORMANCE MONITORING

## Training Reports

After each case, Earsi Otoscope presents trainees with a detailed performance summary. The training system records various parameters relating to procedural and diagnostic abilities. A detailed evaluation allows trainees to improve their skills systematically. Required minimum scores ensure that trainees meet a certain skill level. By providing comprehensive training reports, Earsi Otoscope also allows educators to assess their residents' skill acquisition.





## EDUCATIONAL SUPPORT

# Guidance Elements

Earsi Otoscope features visual and audio guidance to support beginners in their learning process by highlighting anatomical findings, for example. A gauge on the touchscreen user interface indicates how far the otoscope is inserted into the auditory canal. The virtual patient will also utter a sound of discomfort if trainees insert the otoscope too far and touch the sensitive bony part of the ear canal. To further provide orientation to beginning trainees, charts of the tympanic membrane highlight the currently visible area and the areas already examined.

## MEDICAL BACKGROUND

# Findings Tiles

When a trainee detects an anatomical feature or pathological finding in courses A and B, it is highlighted in the simulation. At the same time, a findings tile appears on the touch screen, providing medical background information. All detected findings are stored in the trainee's personal findings library and are also accessible on the VRmNet web portal for recap. Trainees can use the findings menu on the simulator to start cases associated with the specific finding.

## DIAGNOSTIC TRAINING

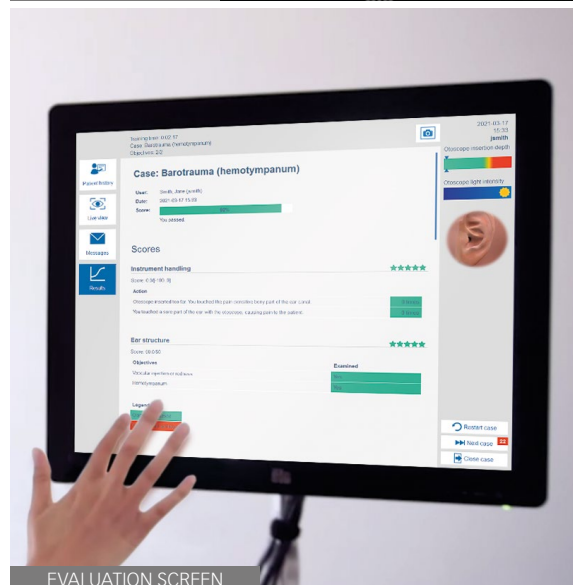
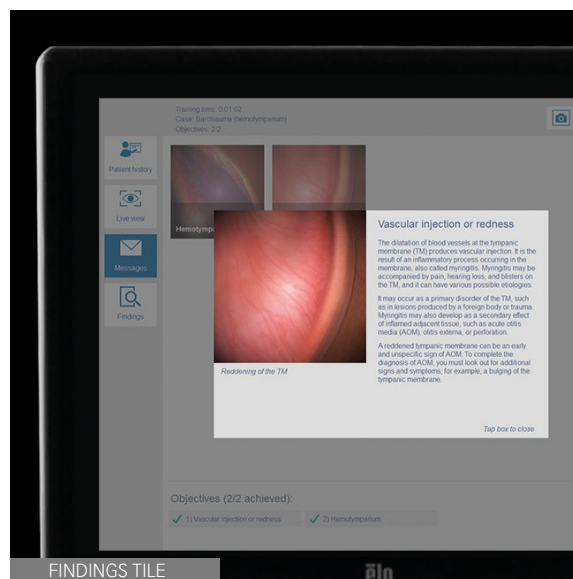
# Multiple-Choice Forms

In exam mode, trainees have to find pathological signs without guidance. They have to specify their findings and diagnoses in multiple-choice forms, which are then evaluated by the training system. Correct, wrong, or missing indications are shown on the result screen after the examination.

## PERFORMANCE ASSESSMENT

# Detailed Evaluation

At the end of each examination, Earsi Otoscope trainees are presented with a detailed evaluation of their performance. Scored parameters include instrument handling, examined area of the tympanic membrane, examination time, anatomical structures and pathological signs found, and correct or wrong diagnoses. Both trainees and educators have access to the accumulated training data on the VRmNet web portal.



# VRmNet Web Portal for Networked Simulators

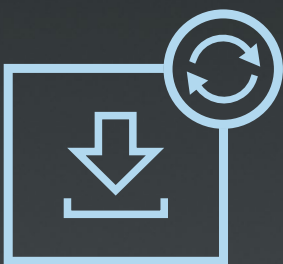
VRmNet is a web-based service available for networked medical training simulators from Haag-Streit Simulation. The web portal offers online features for both trainees and educators. Users can access their personalized VRmNet dashboard from any computer or mobile device 24/7.

## EASY ADMINISTRATION

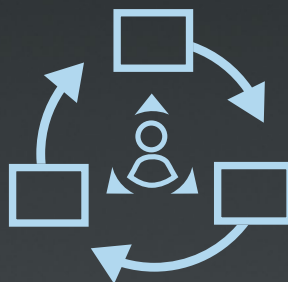
### Teaching Large Classes Efficiently

Educators can use the VRmNet to comfortably set up users and manage courses. Configurable notifications and reports keep teachers informed on their classes' training status. Trainees log in to VRmNet to access their training data and their findings library for recap of learning content. To prepare trainees for their first training session, VRmNet provides an online orientation with short videos on simulator usage.

## Benefits for Operation and Service



Automatic Updates



Optimized Allocation



Online Service

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## Administration Tools

Educators can use VRmNet to comfortably set up users, manage courses, and monitor their classes' training progress.

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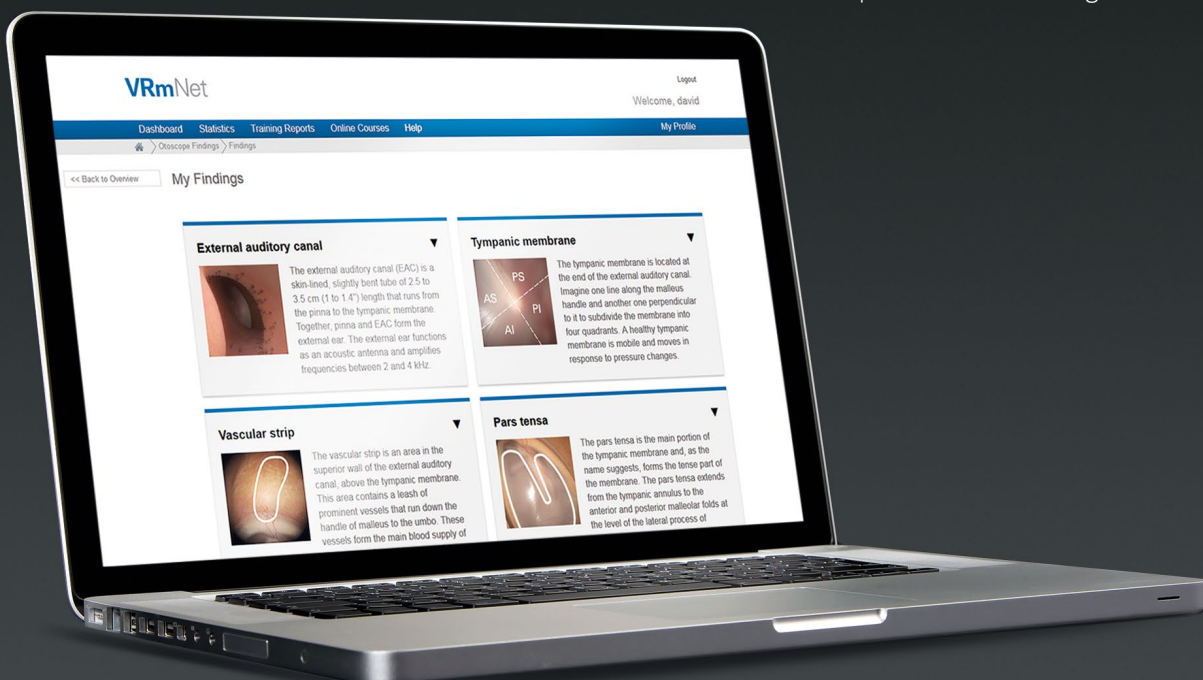
## Online Learning for Trainees

For trainees, VRmNet features an online orientation on training with the Earsi Otoscope simulator and medical background information for recap of learning content.

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## Automatic Software Updates

All simulators connected to VRmNet receive the latest software updates automatically. Customers profit from data back-ups and synchronization as well as easily operated service through the VRmNet networking.



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