



ArthroTrainer –
the high-end platform for the safe training of
diagnostic and surgical skills in arthroscopy

Virtual Reality (VR)

in Medical Training and Further Education at KARL STORZ

Minimally invasive surgery (MIS) places special demands on the medical training and further education of surgeons. This is why KARL STORZ, one of the leading manufacturers in the MIS sector, is committed to providing its customers with optimum support for medical training and further education. KARL STORZ believes that the use of simulators holds great potential in this area.

Simulator training was first successfully implemented in fields such as aviation. It is commonplace for pilots to train various scenarios not only during training but throughout their entire professional career – mainly using (flight) simulators.

The adaptation of simulator training to medical education and to MIS in particular opens up new horizons for the medical training of surgeons. Virtual reality training simulators offer surgeons the opportunity to acquire the technical skills required for MIS under standardized conditions in a controlled environment. Simulator training is particularly useful for enhancing skills related to instrument handling and navigation in a three-dimensional space via a two-dimensional monitor as well as providing more efficient training of specific surgical steps. Computer-based simulators allow trainees to review and practice procedures as often as required. Moreover, simulators reduce costs for consumable parts.

Simulation training enables learners to acquire essential surgical skills and procedures and thus has a positive outcome on actual procedures in the clinic.

KARL STORZ offers VR simulators for urology (UroTrainer), gynecology (GynTrainer) and arthroscopy (ArthroTrainer). The KARL STORZ trainer family offers novice and experienced surgeons a modern and comprehensive training system for diagnostic and therapeutic interventions. The simulators provide training in basic skills such as hand-eye coordination and diagnostic tours as well as entire procedures such as, for example, meniscectomy (ARTHRO), TURP (URO) or polypectomy (GYN).

The GynTrainer features an anatomical pelvis model and the ArthroTrainer a shoulder and knee model for a realistic tactile feedback. The UroTrainer, on the other hand, features a Simbox that provides realistic force feedback. In conjunction with virtual patient cases, the system allows the trainee to gain practical experience that is essential for the safe performance of interventions.

A further advantage is the feedback report. After each completed task, the trainee receives a feedback report with expert-defined scores on basic parameters such as training time, precision of movements and the identification of possible errors (depending on the task). Furthermore, all procedures are recorded and can be analyzed at a later date with a tutor/supervisor/mentor.

Trainees and tutors have the option of monitoring individual development. Each participant has an own account that offers the possibility to track or review procedures at any time.

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POWERED BY
VIRTAMED



Knee	Shoulder
<p>Original arthroscope and instruments provide a complete simulation experience and facilitate familiarization with instruments. The ArthroTrainer is equipped with:</p> <ul style="list-style-type: none"> Anatomic knee model providing realistic tactile sensation 3 virtual optics: 0°, 30° and 70° High-end PC and 23" multi touch screen, mouse and keyboard Movable display cart with height-adjustable screen 	<p>Original arthroscope and instruments provide a complete simulation experience and facilitate familiarization with instruments. The ArthroTrainer is equipped with:</p> <ul style="list-style-type: none"> Anatomic shoulder model providing realistic tactile sensation 3 virtual optics: 0°, 30° and 70° High-end PC and 23" multi touch screen, mouse, keyboard Movable display cart with height-adjustable screen
<p>Basic Skills</p> <p>9* guided training courses enable basic skills to be mastered, fully integrated into a realistic simulation.</p> <p>Learning objectives:</p> <ul style="list-style-type: none"> Learn the correct way to perform a diagnostic tour Correctly handle the instruments without causing cartilage damage inside the knee Detect and eliminate lesions and malformations in a safe and efficient manner Understand the concept of triangulation 	<p>Basic Skills</p> <p>8* guided training courses enable basic skills to be mastered, fully integrated into a realistic simulation.</p> <p>Learning objectives:</p> <ul style="list-style-type: none"> Learn the correct way to perform a diagnostic tour Correctly handle the instruments without causing cartilage damage inside the shoulder Detect and eliminate lesions and malformations in a safe and efficient manner
<p>Diagnostic Module</p> <p>8* virtual patient cases with varying level of difficulty offer the trainee the chance to perform complete diagnostic arthroscopic interventions. Virtual patients include different meniscus lesions, unhappy triad and arthrosis grade I-III.</p> <p>Learning objectives:</p> <ul style="list-style-type: none"> Inspect the knee completely and describe visible lesions Safely handle the instruments to avoid collisions with the tissue Safety in systematic examination, inspection of all important features 	<p>Diagnostic Module</p> <p>4* different virtual patient cases with varying level of difficulty offer the trainee the chance to perform complete diagnostic arthroscopic interventions. Virtual patients include different lesions in rotator cuff and impingement syndrome.</p> <p>Learning objectives:</p> <ul style="list-style-type: none"> Inspect the shoulder completely in both joint spaces and describe visible lesions Safely handle the instruments to avoid collisions with the tissue
<p>Therapeutic Module</p> <p>11* virtual patients with various lesions in different locations provide training for the first steps in operative arthroscopy using the operating equipment. Virtual patients include different meniscus lesions, synovial membrane inflammations and loose body removal.</p> <p>Learning objectives:</p> <ul style="list-style-type: none"> Inspect the knee completely and describe visible pathologies Treating the diagnosed pathologies Grasp and remove the chips from the knee: Analyze and review the operation 	<p>Therapeutic Module</p> <p>3* virtual patients with various lesions in different locations provide training for first steps in operative arthroscopy using OR equipment. Virtual patients include loose body removal, subacromial debridement and decompression.</p> <p>Learning objectives:</p> <ul style="list-style-type: none"> Inspect the shoulder completely and describe visible pathologies Treating the diagnosed pathologies Grasp and remove the chips from the shoulder: Analyze and review the operation
<p>Expert-defined metrics provide objective feedback and thus offer the best learning outcomes.</p>	

* The number of patient cases may change due to further development of the product.

High-End Simulator

ArthroTrainer



573610 **Stationary ArthroTrainer**, with anatomical knee and shoulder module* in a reusable transport case, complete set, ideal for use at conferences, workshops and training centers, including:

Integrated Learning Management System
High-End PC and 23" Multi Touch Screen
Mobile Cart, with height-adjustable monitor
ArthroTrainer Tool Set, consisting of:

- Arthroscope**
- Grasper/Punch**
- Shaver**
- Palpation Hook**
- Software**
- Wireless Keyboard**
- Mains Cord**
- Cleaning Box**

* the shoulder can be positioned in the beach chair and lateral decubitus position

573613 **Same**, with anatomical knee and shoulder modules, in disposable packaging

573611 **Same**, with anatomical knee module only, in a reusable transport case

573614 **Same**, with anatomical knee module only, in disposable packaging

573612 **Same**, with anatomical shoulder module only, in a reusable transport case

573615 **Same**, with anatomical shoulder module only, in disposable packaging

Extensions for ArthroTrainer



573210

Knee Module ArthroTrainer, without platform, with Anatomical Knee Model 5733102 and software,
- 9 basic skills training tasks, virtual patient cases
- 8 virtual patients for diagnostic arthroscopy
- 11 virtual patients for therapeutic arthroscopy
- Feedback report with objective metrics



573211

Shoulder Module ArthroTrainer, without platform, with Anatomical Shoulder Model 5733105 (for beach chair and lateral positioning) and software,
- 10 basic skills training tasks, virtual patient cases
- 8 virtual patients for diagnostic arthroscopy
- 8 virtual patients for therapeutic arthroscopy
- Feedback report with objective metrics



Extensions for ArthroTrainer



5733102 **Anatomical Knee Model without Software,**
with stand and electromagnetic tracking

5733103 **Refurbishment of Anatomical Knee Model,**
replacement of worn components (incidentals),
refurbishment, calibration and function control

5733104 **Skin Cover for Anatomical Knee Model,**
customized cover with access points to the knee joint



5733105 **Anatomical Shoulder Model without Software,**
with stand and electromagnetic tracking

5733106 **Refurbishment of Anatomical Shoulder Model,**
replacement of worn components (incidentals),
refurbishment, calibration and function control

5733107 **Skin Cover for Anatomical Shoulder Model,**
customized cover with access points to the shoulder
joint

Additional Instrumentation for the ArthroTrainer



5733101

Arthroscope, adapted original instrument with sensors



5733002

Grasper/Punch, adapted original instrument with sensors



5733003

Shaver, adapted original instrument with sensors



5733004

Palpation Hook, adapted original instrument with sensors

5733100

ArthroTrainer Tool Set,
consisting of:
Arthroscope
Grasper/Punch
Shaver
Palpation Hook



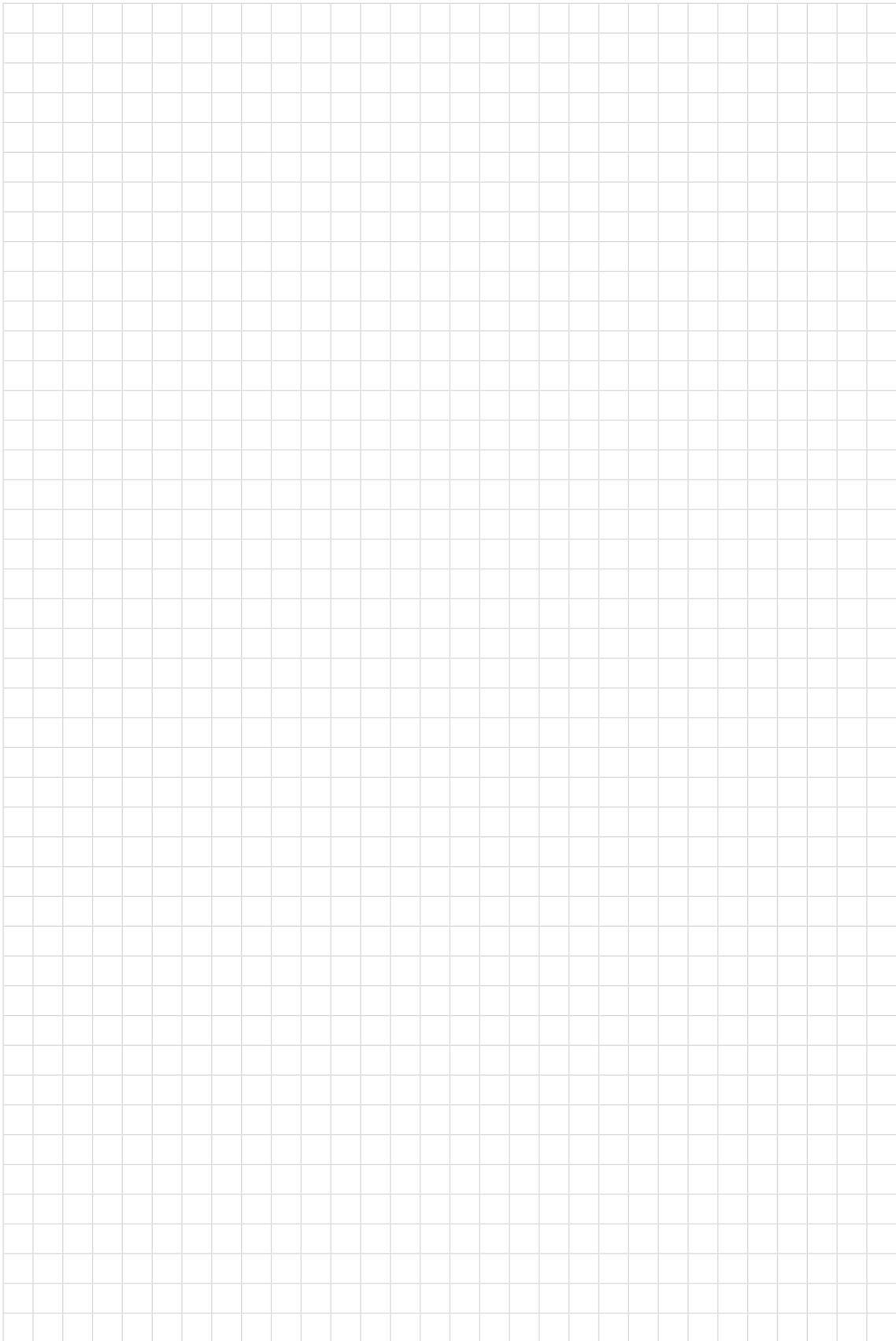
5733001

Transport Case, for all stationary trainers, reusable,
recommended for frequent shipment

Notes



Notes



Notes

A large rectangular area filled with a fine grid pattern, intended for taking handwritten notes.

It is recommended to check the suitability of the product for the intended procedure prior to use.



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