VIRTAMED

VirtaMed ArthroS™
Virtual reality arthroscopy for knee, shoulder, hip, ankle & FAST basic skills

Highest realism

- Anatomically accurate models create the sensation of operating on real patients.
- Bleeding & complications.
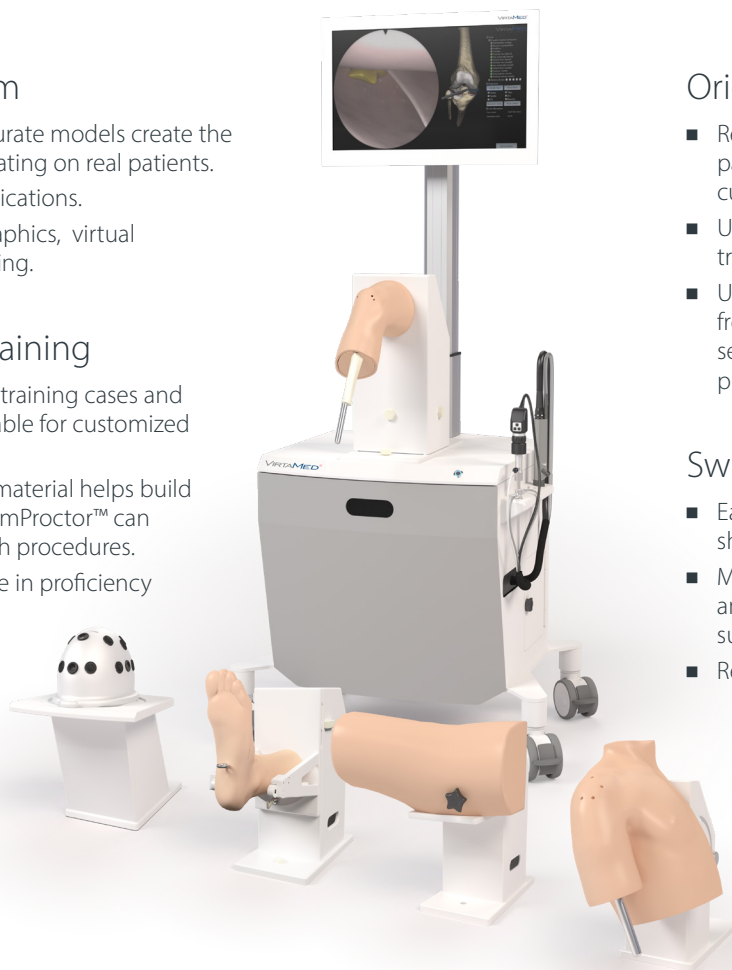- Photo-realistic graphics, virtual fluoroscopy imaging.

Customized training

- Endless variety of training cases and pathologies available for customized curriculum.
- Didactic reading material helps build the foundation, SimProctor™ can guide you through procedures.
- Track record of use in proficiency exams.

Original instruments

- Real surgical tools such as palpation hook, grasper, cutting punch, and shaver.
- Using original tools eases transfer of skills to the OR.
- Unlimited range of motion, free portal placement and selection even during procedure.

Swiss engineering

- Easy switch between knee, shoulder, hip, and FAST.
- Modules can be adjusted and positioned for different surgical skills training.
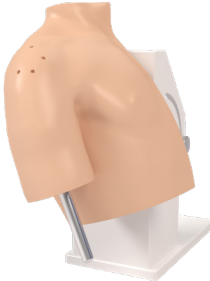- Regular software updates.
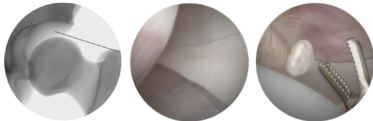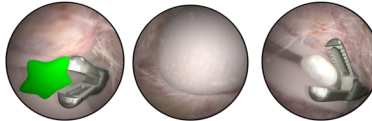
The VirtaMed orthopedic platform

ArthroS™ FAST	ArthroS™ Knee	ArthroS™ Knee ACL ADD-ON

Training goals

- Basic training for general arthroscopy.
- Manipulate objects deliberately, grasp stationary targets.
- Triangulate, handle camera and tools with both dominant and non-dominant hand.
- Access through anterior and posterior portals.
- Use different scope angles: 0, 30 and 70 degrees.

Training goals

- Basic and advanced training for knee arthroscopy.
- Triangulate, handle camera and tools.
- Navigate and manipulate the joint.
- Recognize important landmarks in the knee.
- Diagnose and treat numerous pathologies.

Training goals

- Understand the concepts of ACL reconstruction with different complications.
- Diagnose different kinds of ACL tears.
- Recognize ideal location for drill, guidewire, and graft.
- Perform ACL reconstruction.

Training cases included:

Didactic materials
General concepts of arthroscopy.

Training cases
Image centering; telescoping; horizon control; probe triangulation; and periscoping.

Training cases included:

Didactic materials
General concepts of arthroscopy; and basic principles of knee arthroscopy.

Basic skills cases
Guided diagnostics for knee and menisci; triangulation; "catch the stars"; and guided meniscectomy.

Diagnostic cases
Unknown cases; knee tour; flap and meniscus tears; bucket handle tears; parrot beak tear; arthrosis; and loose bodies.

Surgical cases
Various meniscectomy; unhappy triad; synovitis; and loose body removal.

Training cases included:

Didactic ACL materials
Principles of ACL reconstruction; and anatomical concepts.

Surgical ACL cases
Guided and unguided ACL reconstruction; and ACL tears and ruptures.

ArthroS™ Shoulder	ArthroS™ Hip	ArthroS™ Ankle

Training goals

- Basic and advanced training for shoulder arthroscopy.
- Triangulate, handle camera and tools.
- Navigate and manipulate the joint for visualization.
- Use beach chair and lateral positioning.
- Diagnose and treat numerous pathologies.

Training goals

- Basic and advanced training for hip arthroscopy.
- Triangulate, handle camera and tools.
- Palpate the bony landmarks and use fluoroscopy imaging to locate ideal access points.
- Create your own access portals.
- Joint traction and hip flexion; lateral and supine position.
- Diagnose and treat numerous pathologies.

Training goals

- Basic and advanced training for ankle arthroscopy.
- Triangulate, handle camera and tools.
- Navigate and manipulate the joint for visualization.
- Anterior and posterior access in prone and supine positions; dorsiflexion and plantar flexion; joint distraction.

Training cases included:

Didactic materials
General concepts of arthroscopy; basic principles of shoulder arthroscopy.

Basic skills cases
Guided diagnostic glenohumeral; subacromial; palpation; triangulation; 15 point shoulder examination; and "catch the stars".

Diagnostic cases
Unknown cases; superficial rotator cuff tear and calcification; SLAP lesion; Bankart lesion; and healthy shoulder.

Surgical cases
Subacromial debridement; subacromial decompression; and loose body removal.

Training cases included:

Basic skills cases
Guided diagnostics central; triangulation central and peripheral; and "catch the stars".

Diagnostic cases
Healthy hip; Labrum rupture; CAM deformity; and cartilage flap on acetabulum.

Surgical cases
Loose body removal and CAM decompression.

Training cases included:

Basic skills cases
Guided diagnostics; palpation; triangulation; and "catch the stars"

Diagnostic cases
Healthy left ankle; osteochondritis on talus; and various impingement cases.

Surgical cases
Loose body removal and anterior decompression.

VirtaMed ArthroS™: Evidence and testimonials

The VirtaMed ArthroS™ has been validated by several studies to make sure it is the most realistic, accurate and helpful tool on the market for arthroscopy training. For example, construct validity studies[1] prove that the simulator recognizes the difference between experts and novices. Through validation studies we also know that simulator training helps,[2] and that the VirtaMed ArthroS™ beats competition in realism.[3]

ASSET score after 1 ArthroS™ training   ASSET score after 5 ArthroS™ trainings

Simulator training makes a difference, as shown by the ASSET scores of different groups after one training session and again after five training sessions on the VirtaMed ArthroS™ Knee. Although all tested learning was beneficial, training twice a week yielded the highest improvement.[2]

- ■ 5 trainings / week
- ■ 5 trainings / 2.5 weeks
- ■ 5 trainings / 20 weeks
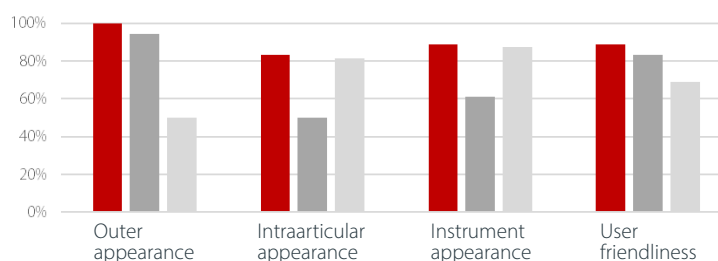
VirtaMed ArthroS™ Shoulder beats the competition: The percentage of evaluation criteria met shows that the ArthroS™ reaches the highest number of good scores.[3]

- ■ VirtaMed ArthroS™
- ■ Competitor A
- ■ Competitor B

Laura Downes, CEO of the Arthroscopy Association of North America (AANA)

" We have assessed all virtual reality arthroscopy simulators on the market, and VirtaMed was clearly the best fit to partner with AANA. The combination of lifelike anatomic models, high-fidelity graphics and original tools adapted for simulation make the VirtaMed ArthroS™ the closest thing to real surgery.

James Bogener, M.D., Residency Program Director, University of Missouri—Kansas City, USA

" After the initial investment, the VirtaMed ArthroS™ is a tremendous cost saver. Every time the resident uses the simulator instead of cadavers or low-fidelity models, it's a 200–300 dollar savings for the residency program.

[1] Pedowitz R, Nicandri G, Tuchschmid S. Asymmetry in Dominant / Non-Dominant Hand Performance Differentiates Novices from Experts on an Arthroscopy Virtual Reality Serious Game. Studies in Health Technology and Informatics. 2016; 220: 289–294.

[2] Reppenhagen S, Zimmerman L, Buerklein D, Rudert M, Barthel T. Effectivity of arthroscopic skill acquisition in virtual reality knee arthroscopy training. Poster presented at: ESSKA; May 2016; Barcelona.

[3] Martin K, Akoh C, Amendola A, Phisitkul P. Comparison Of Three Virtual Reality Arthroscopic Simulators As Part Of An Orthopedic Residency Educational Curriculum. *The Iowa Orthopedic Journal*. 2016; 36: 20–25.