

## A. Arthroscopy Simulator

### 1. Knee Module

The module presents basic skills, diagnostic and surgical cases for knee arthroscopy, as well as didactic teaching slides. Nine guided basic skill training cases are fully integrated into a highly realistic simulation. Mastering these basic tasks enables doctors and doctor candidates to perform a complete arthroscopy more easily and in an efficient, professional way. Numerous patient cases with varying levels of difficulty offer the trainee the chance to perform complete diagnostic arthroscopic interventions. Patients include different meniscus lesions, unhappy triad and arthrosis grades I, III, and IV. Multiple patients with various lesions in different locations provide training for the first steps in operative arthroscopy using the original operating equipment from the OR. Pathologies include different meniscus lesions, synovial membrane inflammations and loose body removal.

### 2. ACL Reconstruction Module

This module is for specialization in ACL reconstruction. Trainees learn how to navigate the 3D anatomy of the knee joint in relation to the relevant landmarks for ACL reconstruction and learn about the consequences and effects of graft malpositioning. Mastering correct graft positioning is paramount for safe and effective ACL reconstruction.

There are six different learning cases for the ACL reconstruction module. The first two cases cover the main principles of ACL reconstruction and anatomical concepts, and the other four cases present therapeutic patient cases based on the different features and complications of ACL reconstruction surgery. The cases vary from complete ACL tear to partial rupture of the ACL.

### 3. Shoulder Module

The shoulder module includes guided basic skill training cases fully integrated into a realistic simulation, as well as didactic teaching slides. Mastering these basic tasks enables trainees to perform a complete shoulder arthroscopy more easily and in an efficient, professional way. Diverse patients with varying level of difficulty offer the trainee the chance to perform complete diagnostic arthroscopic interventions. Patients include different lesions in rotator cuff and impingement syndrome. Therapeutic cases include loose body removal, subacromial debridement, and decompression.

#### 4. Hip Module

The Hip module features zero radiation fluoroscopy simulation for the trainee to practice how to access the hip joint and to learn to establish proper and safe portals. Using a 70-degree scope, trainees learn to navigate both central and peripheral compartments, applying traction and rotation when necessary. This module contains eight basic guided skill training cases fully integrated into realistic simulation. By mastering these tasks, trainees are more equipped to perform a complete hip arthroscopy. There are four different patients with varying levels of difficulty, which offer the trainee the chance to perform complete diagnostic arthroscopic interventions. Patient cases include different lesions in the labrum and cartilage as well as a cam impingement. Therapeutic cases include loose body removal and cam decompression.

#### 5. Ankle Module

The ankle module features supine and prone patient positioning as well as joint distraction capabilities. The module contains six basic guided skills-training cases fully integrated into realistic simulation. By mastering these tasks, trainees are more equipped to perform a complete ankle arthroscopy. There are five different patients with varying levels of difficulty, which offer the trainee the chance to perform complete diagnostic arthroscopic interventions. Patient cases include lesions in the cartilage as well as an impingement. Therapeutic cases include interventional ankle arthroscopies including loose body removal and anterior decompression.

### B. Gynecologic Surgery Simulator

#### 1. Hysteroscopy essential skills module

Hysteroscopy essential skills module is a complete curriculum designed for structured integration of hysteroscopy training in OB/GYN residency programs. It contains eight different skills exercises with custom-built feedback scores and reports, using an original diagnostic hysteroscope with working channel, providing ideal preparation for the operating room. Exercises in a safe and realistic virtual environment provide a relaxed setting outside of the operating room to facilitate essential skills training. Each task focuses on one critical step of the procedure: Gaining access to the cervix (anteverted uteri, retroverted uteri), learning to manipulate uterine distension, navigation inside the uterine cavity, biopsy polyp removal using grasper or scissors and treating synechia and light cases of Asherman's syndrome.

## 2. Hysteroscopy module

Hysteroscopy is the endoscopic treatment through the cervix with a scope and camera. It is indicated for the resection of submucous myoma and for the resection of lesions such as synechiae or septa. Removing polyps under direct vision prevents adverse events such as missing the polyp during a blind curettage. Thus, hysteroscopy is the gold standard for many diagnostic and therapeutic interventions in case of abnormal uterine bleeding, menstrual pain or even infertility.

## 3. Advanced hysteroscopy module

The advanced hysteroscopy module includes various patients with advanced gynecologic pathologies and is intended for experienced physicians who already have basic skills in diagnostic and therapeutic hysteroscopy. Doctor and candidate doctor acquires advanced hysteroscopy skills and prepares for more difficult interventions such as multiple polyps and myomas of type I and II. Additional cases with uterine adhesions and a septum challenge the trainees and provide better preparation for the operation room. A comprehensive performance review is provided including the amount of pathology removed, safety measures, economy of movement such as camera path, intervention time and use of fluid, and on proper visualization of the uterine surface and the fallopian tubes.

## 4. Intrauterine device (IUD) placement module

Gynecology training for correct placement of IUDs.

## 5. ASRM Embryo transfer module

9 virtual patients for teaching embryo transfer, with and without ultrasound guidance, plus 5 virtual patients for teaching intrauterine insemination. Interchangeable unique uteri / cervix models: straight, bent, and tortuous cervical canal, as well as a canal with false passage. Also includes a retroverted uterus with endometriosis.

## 6. Transabdominal obstetric ultrasound module

Incorporating the 20+2 approach, a combination of 2 overview sweeps & 20 planes, the transabdominal obstetric ultrasound module provides a structured method of examining the mid-trimester fetus. Trainees learn across over 100 cases, various fetal positions, different placenta locations, and doppler imaging. The module contains various fetal abnormalities such as down syndrome, anencephaly, spina bifida, placenta previa, and bilateral renal

agenesis. The transabdominal transducer can be moved freely across the entire abdomen to visualize the fetus.

### **7. Transvaginal obstetric ultrasound module**

A comprehensive training for 1st trimester transvaginal ultrasound, the module contains 16 patient cases. Abnormalities include a possible molar pregnancy, early pregnancy losses, pregnancies of unknown location, double ectopic pregnancy, and a non-pregnant patient. Masses and fluids in the adnexa, as well as Nabothian cysts, are also included. The transfer of skills from the simulator to the patient is facilitated thanks to the realistic tactile sensation of the transvaginal probe.

## **C. Urologic Surgery Simulator**

### **1. TURP basic skills**

First steps in trans-urethral urologic surgery.

This module contains basic tasks which allow the doctor and candidate doctor to acquire all the skills necessary to safely perform a complete TURP procedure. The TURP procedure is broken down into its various steps, visualization, bleeding, resection etc. A training curriculum provided by the module, relies on self-practice in a safe environment until reaching the desired proficiency level. Learners gain experience in identifying the anatomical landmarks, cystoscopy, performing a safe resection, and in controlling bleeding.

### **2. TURP full procedures**

8 virtual patients include small to large prostates with hypertrophies of both lateral and median lobes, presenting various challenges such as difficult access and heavy bleeding. The TURP courses teach an understanding of the anatomical landmarks, depth perception and hand-eye coordination during the TURP procedure and how to control flow and bleedings for a clear view during the.

### **3. Laser BPH: ThuLEP and HoLEP**

The Laser BPH module offers comprehensive training to acquire all skills necessary to safely perform a complete laser BPH treatment. The module provides a training curriculum relying on self-practice until reaching the desired proficiency level. Doctors and candidate doctors learn and practice different laser techniques such as vaporization, vaporessection and enucleation. With the Laser BPH Module, urologists can practice their basic skills and perform a full laser BPH procedure on different patient scenarios. The eight

cases differ in the size of the prostate, in the bleeding affinity of the virtual patient and in possible complications that may arise. For some patients, a median lobe removal solves the problem; in other cases, hypertrophies of both lateral lobes make the intervention more challenging. A morcellation module is available upon request.

#### **4. TURB**

4 virtual patients with different, multiple papillary and solid bladder tumors offer trainees the opportunity to perform complete TURB procedures in a safe environment without involving patient-related risk. The level of difficulty of the cases differs in the type of the bladder tumors and of their location.