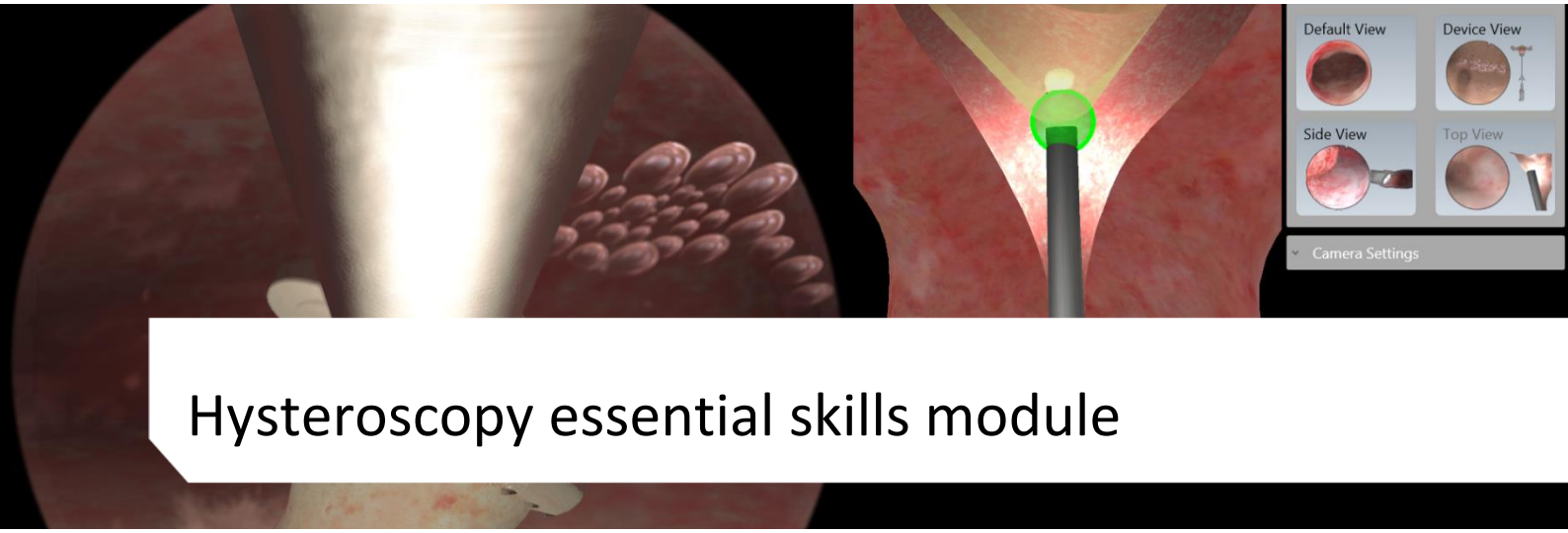


Hysteroscopy essential skills module

Module description

The HystSim™ 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.

SimProctor™ educational guidance

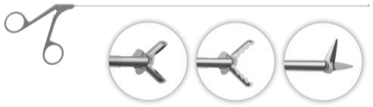
Instructions on safe procedure performance are applied to the anatomical setting, incorporating best practices as defined by an expert panel, helping to learn the main behavioral rules during the procedure. The trainee is provided with tips and tricks to improve performance, ghost tools to demonstrate correct behavior, and videos to guide the trainee and various anatomical views are provided, such as an external and side view to help develop orientation. A patient comfort meter is provided to practice maintaining the best possible patient experience during the procedure.

Learning objectives

- To correctly align the scope.
- To establish uterine distension, clear viewing conditions and safe navigation.
- To identify the right and the left tubal orifice.
- To inspect the uterine cavity by correctly handling the camera.
- To describe all visible pathologies.

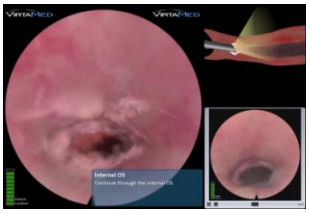
Instruments

Hysteroscope with working channel



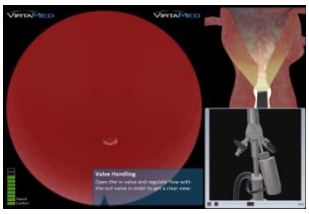
Standard grasper handle (forceps/grasper/scissors)

Cases descriptions



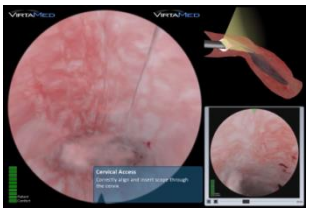
Case 1: Access normal cavity

- This uterine cavity has a regular shape
- No pathologies present



Case 2: Distention anteverted cavity

- Anteverted access
- Small polyp blocks the entrance in the cervical canal
- Challenging change of angles during the access phase



Case 3: Retroverted cavity

- Retroverted uterus
- The light pole needs to be turned 180° up to gain entry in the fundus

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Case 4: Navigation

- Regularly shaped uterus contains a 1cm type I myoma close to the left tubal ostium

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Case 5: Biopsy

- Uterine cavity with four suspicious looking spots in different locations

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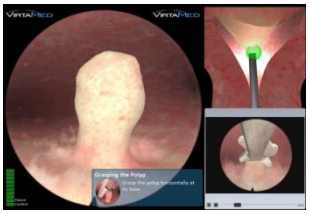

Case 6: Polyp removal with grasper

- Regular shaped uterine cavity contains a small pedunculated polyp centered at the posterior wall

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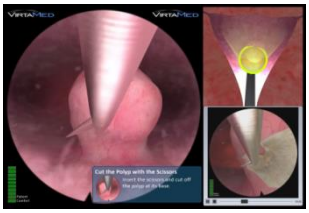

Case 7: Polyp removal with scissors

- Regularly shaped uterus with a 1.5cm medium-sized polyp at the posterior wall close to the tubal ostium

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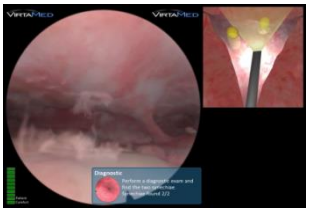
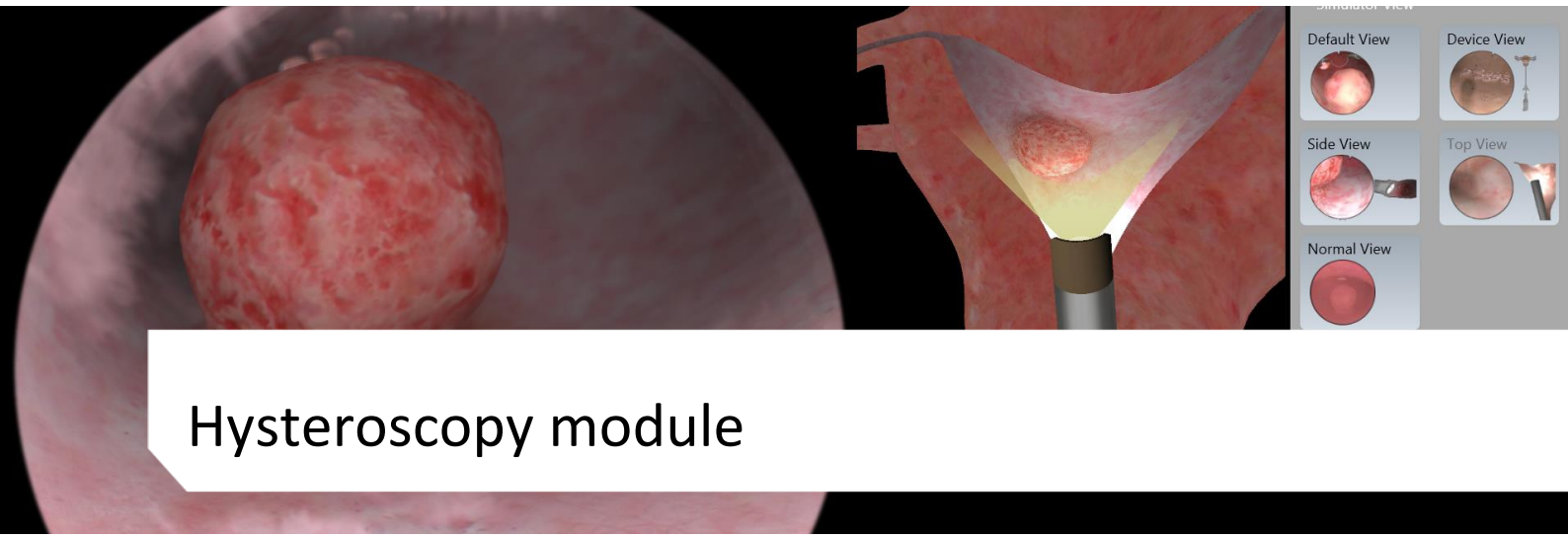


Case 8: Uterine synechia

- Uterine synechiae or intrauterine adhesions are characterized by the presence of adhesions and/or fibrosis within the uterine cavity



Hysteroscopy module

Module description

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.

Diagnostic and surgical hysteroscopy

The module offers 12 virtual patients with varying pathologies and with different levels of difficulty. The trainee gains experience in the usage of the angled optics, establishing a clear view and learns to visualize the entire cavity in a safe environment. Performance review provides feedback on the visualized uterine surface, economy (procedure time, camera path), safety measures (collisions of camera with uterine wall), as well as feedback on fluid handling.

Endometrium ablation

Rollerball endometrial ablation remains the gold standard for the permanent treatment of abnormal uterine bleeding. It is performed under direct vision, and provides both diagnostic and therapeutic intervention for abnormal uterine bleeding. The module contains 4 different virtual patients with varying shapes of uterine cavities. Endometrial ablation with the rollerball is an ideal exercise to gain practice in electrosurgery in all positions and in the entire uterus. Performance review provides feedback on a visual overview of the coagulated uterine surface, economy (procedure time, camera path), and safety measures.

Polypectomy

A uterine polyp is an endometrial lesion taking up space within the uterine cavity. Symptoms include irregular menstrual bleeding, bleeding between menstrual periods, excessively heavy menstrual bleeding, and vaginal bleeding after menopause. A hysteroscopic treatment is preferred to a blind curettage. The module offers 8 virtual patients with various polyps in different positions and aims at providing training for the first steps in operative hysteroscopy using the loop electrode. Performance review provides feedback on the amount of the removed polyp, economy (procedure time, camera path), and safety measures.

Myomectomy

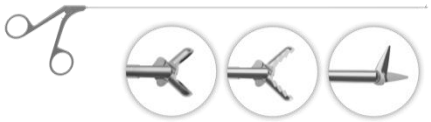
Uterine fibroids are benign tumors which grow from the muscle layers of the uterus. Symptoms include abnormal gynecologic hemorrhage, heavy or painful periods, abdominal discomfort or bloating, back ache, urinary frequency or retention, and in some cases, infertility. If a fibroid is predominantly submucosal, complete hysteroscopic resection is possible. The module offers 8 virtual patients with varying types of submucosal fibroids (type 0) in different positions and with different levels of difficulties. Performance review provides feedback on amount and quality of the removed fibroids, economy (procedure time, camera path), and safety measures.

Learning objectives

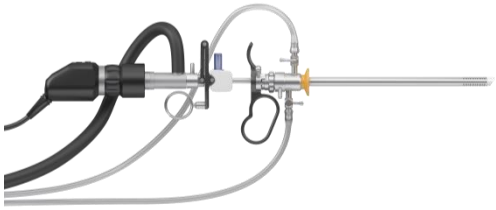
- To establish uterine distension and clear viewing conditions.
- To confirm the correctly placed hysteroscope by identifying the right and the left tubal orifice.
- To inspect the uterine cavity completely by directing the camera efficiently over the entire endometrial surface while maintaining a clear view.
- To use the rollerball in a systematic way to ablate the complete endometrial surface, while not ablating the endocervix.
- To describe all visible pathologies.

Instruments

Hysteroscope with working channel

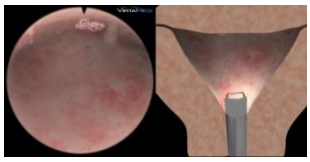


Standard grasper handle (forceps/grasper/scissors)



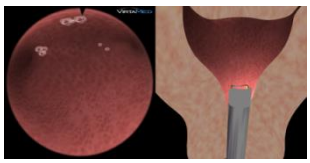
Resectoscope with rollerball or with cutting loop

Diagnostic and surgical hysteroscopy cases



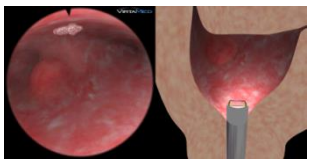
Diagnostics easy 1

- Normallly shaped cavity, parous woman
- No pathology
- No bleeding



Diagnostics easy 2

- Arcuate uterus, parous woman
- No pathology
- No bleeding



Diagnostics easy 3

- Spheric cavity with asymmetric tubal angles, parous woman, little bleeding
- Small myoma close to the right fallopian tube at the fundus

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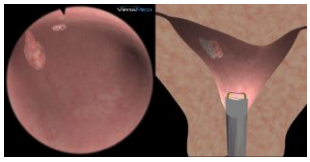
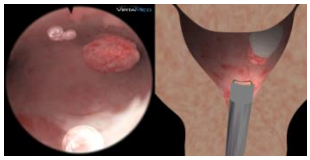


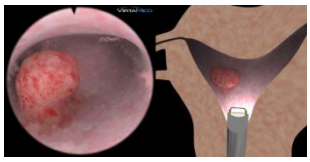
Diagnostics easy 4

- Bicorne uterus with asymmetric tubal angles
- Small pedunculated polyp in front of the right fallopian tube at the anterior wall
- Little bleeding



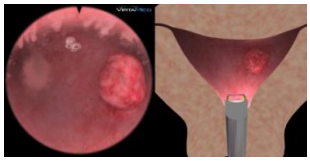
Diagnostic medium 1

- Arcuate uterus, symmetric tubal angles
- Medium-sized myoma in the fundus/anterior wall close to the left fallopian tube
- Fluffy tissue, little bleeding



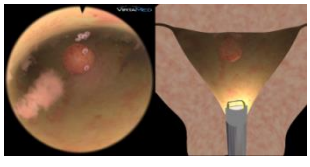
Diagnostic medium 2

- Bicorne uterus, asymmetric tubal angles
- Medium-sized myoma in the right part of the uterus
- Fluffy tissue, little bleeding



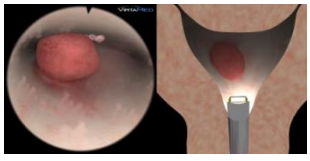
Diagnostic medium 3

- Normal cavity, deep symmetric tubal angles
- Larger myoma blocking the right fallopian tube
- Floating tissue, fluffy, little bleeding



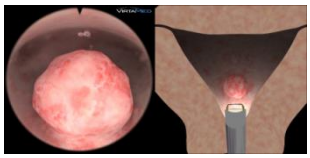
Diagnostic medium 4

- Normally shaped uterus
- Small myoma at the fundus
- Little bleeding when entering the right ostia
- Few fluffy tissue parts



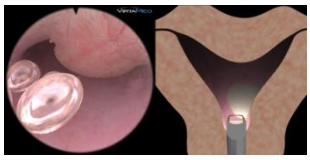
Diagnostics difficult 1

- Narrow, tight uterus
- Larger myoma centered in the uterus, on the posterior wall
- Medium bleeding



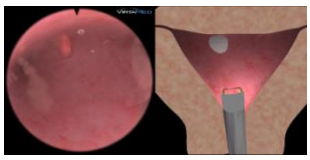
Diagnostics difficult 2

- Normally shaped uterus
- Stronger bleeding, fluffy tissue quality
- Medium-sized myoma partially closing the cervix
- Second, smaller fibroid hidden behind the other one



Diagnostics difficult 3

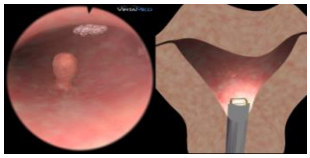
- Arcuate uterus
- Large myoma at the anterior wall partially blocking the entry from the cervical canal into the uterus
- Stronger bleeding, difficult entry



Diagnostics difficult 4

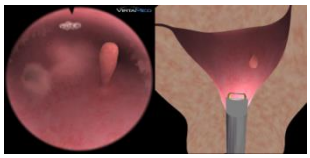
- Normally shaped uterus
- Small polyp located close to the fundus at the anterior wall
- Floating tissue parts, fluffy, stronger bleedings

Polypectomy cases



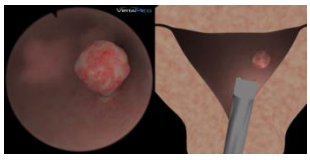
Polypectomy easy 1

- Arcuate uterus
- Small polyp on the right posterior wall
- Few fluffy tissue parts



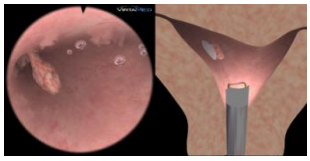
Polypectomy easy 2

- Arcuate uterus
- Pedunculated polyp with a narrow, elongated stalk located on the back/posterior wall left
- Fluffy tissue texture



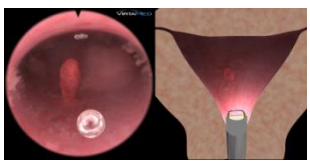
Polypectomy easy 3

- Normally shaped uterus
- Medium-sized polyp in front of the left fallopian tube



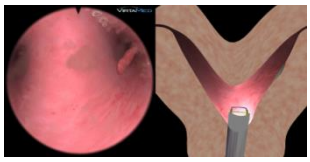
Polypectomy easy 4

- Bicorne uterus, asymmetric tubal angles
- Small polyp blocking the right fallopian tube, attached to the anterior wall
- Some floating tissue parts



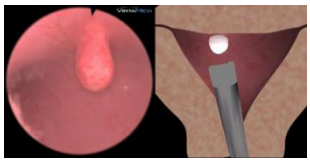
Polypectomy medium 1

- Normally shaped uterus
- Pedunculated polyp of small size located in the center of the uterus, attached to the posterior wall
- Fluffy tissue



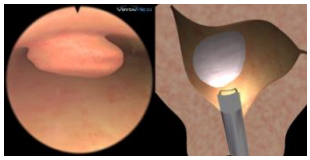
Polypectomy medium 2

- Bicornuate, symmetric uterus
- Small, narrow and elongated pedunculated polyp inside of the left fallopian tube
- Tissue parts floating in the uterus



Polypectomy medium 3

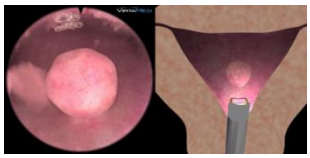
- Normally shaped uterus
- Medium-sized, sessile polyp with a broad base close to the fundus, in anterior position
- Almost clear view



Polypectomy medium 4

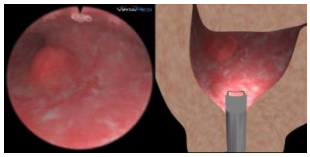
- Heavily distorted cavity, parous woman
- Large sessile polyp with a broad base blocking the right tubal opening, attached to the anterior wall
- Fluffy tissue

Myomectomy cases



Myomectomy medium 1

- Normally shaped uterus
- Myoma centered in the uterus
- Tissue a little bit fluffy



Myomectomy medium 2

- Spheric cavity with asymmetric tubal angles, parous woman, little bleeding
- Small myoma close to the right fallopian tube at the fundus

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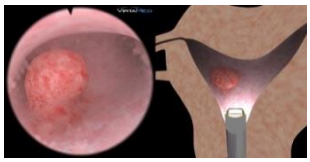
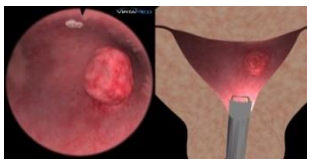


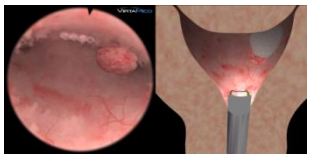
Myomectomy medium 3

- Bicorne uterus, asymmetric tubal angles
- Medium-sized myoma in the right part of the uterus
- Fluffy tissue, little bleeding



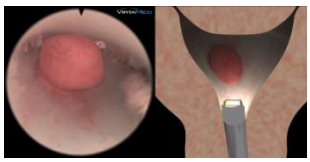
Myomectomy medium 4

- Normal cavity, deep symmetric tubal angles
- Larger myoma blocking the right fallopian tube
- Floating tissue, fluffy, little bleeding



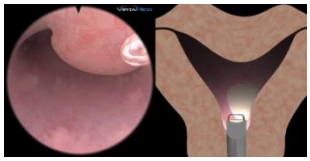
Myomectomy difficult 1

- Arcuate uterus, symmetric tubal angles
- Medium-sized myoma in the fundus/anterior wall close to the left fallopian tube
- Fluffy tissue, little bleeding



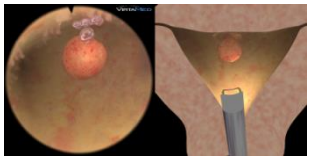
Myomectomy difficult 2

- Narrow, tight uterus
- Larger myoma centered in the uterus, on the posterior wall
- Medium bleeding



Myomectomy difficult 3

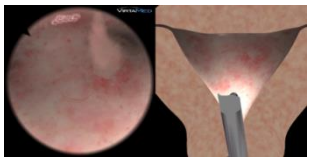
- Arcuate uterus
- Large myoma at the anterior wall partially blocking the entry from the cervical canal into the uterus
- Stronger bleeding, difficult entry



Myomectomy difficult 4

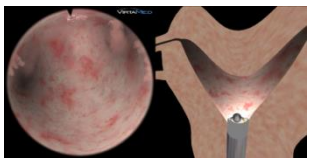
- Normally shaped uterus
- Small myoma at the fundus
- Little bleeding when entering the right ostia
- Few fluffy tissue parts

Endometrium ablation cases



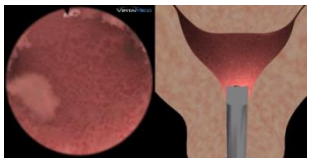
Endometrium ablation medium 1

- Normally shaped uterus
- No bleeding
- Easy access



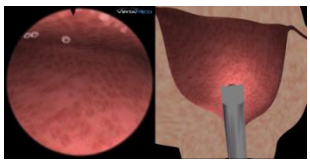
Endometrium ablation medium 2

- Bicornuate uterus
- No bleeding
- Little bit fluffy tissue



Endometrium ablation medium 3

- Arcuate uterus with symmetric deep tubal angles
- No bleeding
- Floating tissue parts, very fluffy



Endometrium ablation medium 4

- Spheric cavity, multiparous woman
- Very narrow, tight uterus
- Some fluffy tissue parts

Advanced hysteroscopy resection module

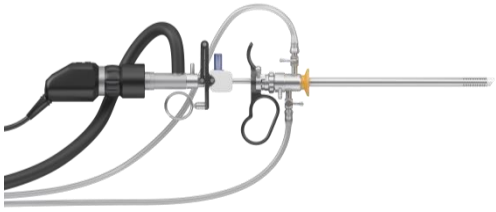
Module description

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. The trainee 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.

Learning objectives

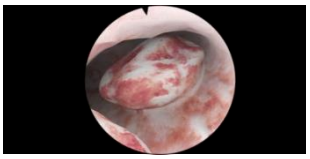
- To acquire advanced skills in hysteroscopy.
- To learn how to cope with multiple pathologies in one cavity.
- To work with the inflow and uterine distension to let intramural parts of myomas expand into the cavity.
- To distinguish adhesions and synechiae from a septum.
- To re-establish intact uterine cavity by removing pathologies.

Instruments



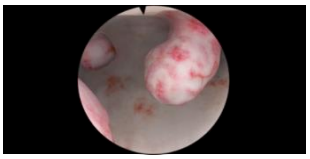
The module requires the same resectoscope as in the diagnostic and therapeutic module. Switching between the loop electrode and the needle electrode is performed within the simulation software.

Advanced hysteroscopy cases



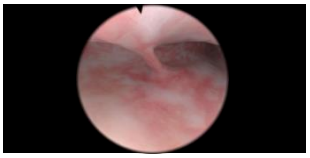
Multiple polyps

- Visualize the entire cavity while navigating in a secure manner
- You will encounter multiple polyps
- Remove all polyps at the base



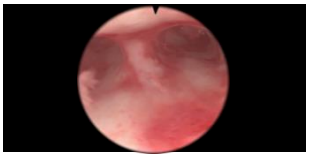
Multiple myoma type I & II

- Multiple myoma blocking the access
- Resect until you reach the endometrium
- Turn off the inflow to expel intramural tissue
- Carefully resect intramural part



Uterine synechiae

- Visualize the uterine synechiae in the uterine cavity
- Identify and resect the adhesions with the needle electrode
- Establish a fully extendable cavity



Uterine septum

- Identify and resect the septum with the needle electrode
- Resect carefully without perforating the uterus
- Establish a fully extendable cavity