# VirtaMed GynoS™

Module descriptions

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VirtaMed

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Version 2409

# 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

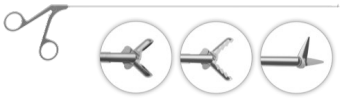
Instructions on safe procedure performance are applied to the anatomical setting, incorporating best practices as defined by an expert panel, helping to learn the main behavioral rules during the procedure. The trainee is provided with tips and tricks to improve performance, ghost tools to demonstrate 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.

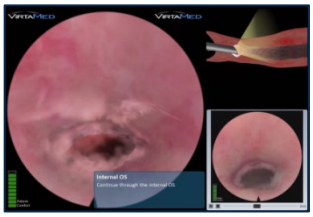
## Instruments

Hysteroscope with working channel



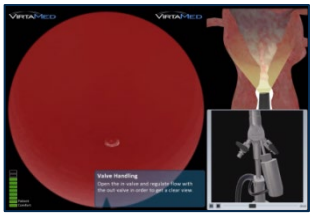
Standard grasper handle (forceps/grasper/scissors)

## Cases descriptions



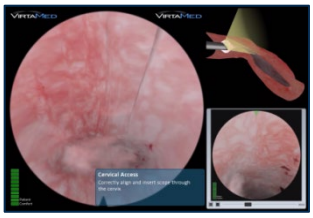
**Case 1: Access normal cavity**

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



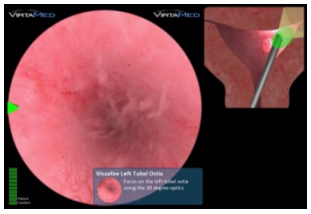
**Case 2: Distention anteverted cavity**

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



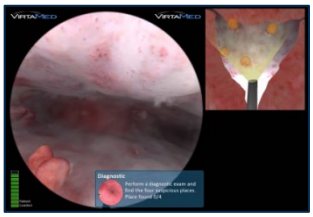
**Case 3: Retroverted cavity**

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



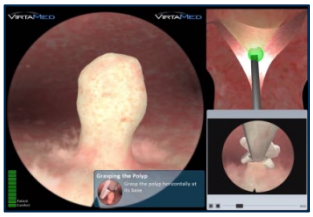
**Case 4: Navigation**

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



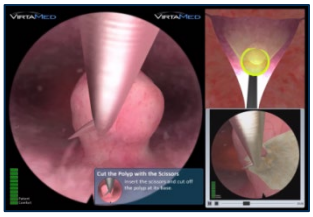
**Case 5: Biopsy**

- Uterine cavity with four suspicious looking spots in different locations



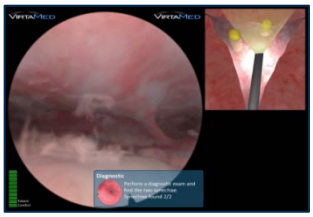
**Case 6: Polyp removal with grasper**

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



**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



**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

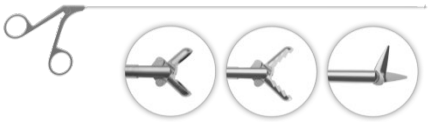
Uterine fibroids are benign tumors which grow from the muscle layers of the uterus. Symptoms include abnormal gynecologic hemorrhage, heavy or painful periods, abdominal discomfort or bloating, back ache, urinary frequency or retention, and in some cases, infertility. If a fibroid is predominantly submucosal, 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

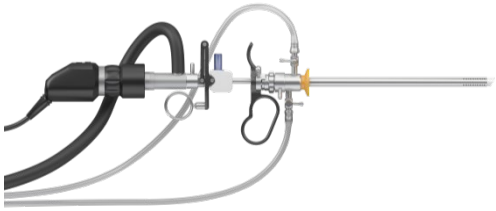
- To establish uterine distension and clear viewing conditions.
- To confirm the correctly placed hysteroscope by identifying the right and the left tubal orifice.
- To inspect the uterine cavity completely by directing the camera efficiently over the entire endometrial surface while maintaining a clear 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

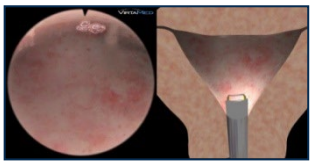


Standard grasper handle (forceps/grasper/scissors)



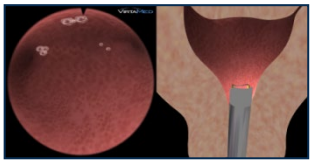
Resectoscope with rollerball or with cutting loop

## Diagnostic and surgical hysteroscopy cases



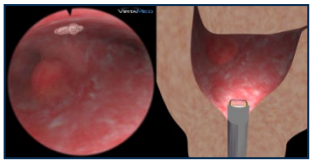
**Diagnostics easy 1**

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



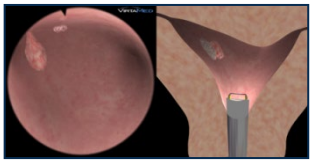
**Diagnostics easy 2**

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



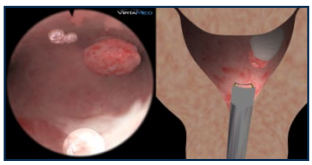
**Diagnostics easy 3**

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



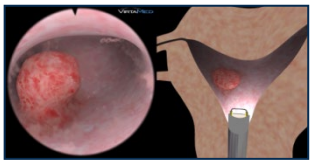
**Diagnostics easy 4**

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



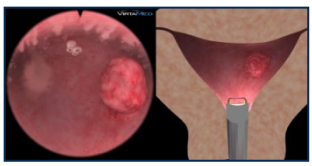
**Diagnostic medium 1**

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



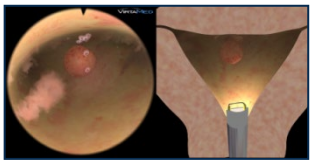
**Diagnostic medium 2**

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



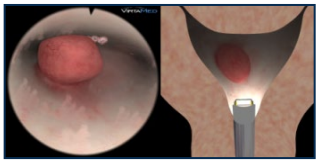
**Diagnostic medium 3**

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



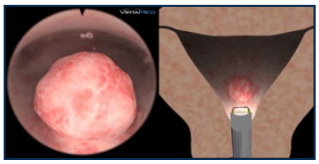
**Diagnostic medium 4**

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



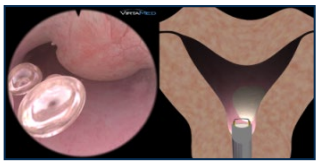
**Diagnostics difficult 1**

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



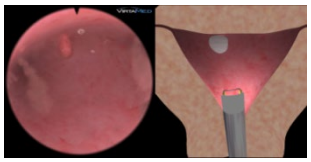
**Diagnostics difficult 2**

- 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**

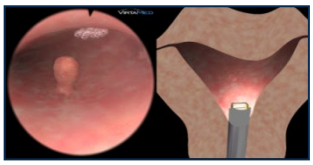
- Arcuate uterus
- Large myoma at the anterior wall partially blocking the entry from the cervical canal into the uterus
- Stronger bleeding, difficult entry



**Diagnostics difficult 4**

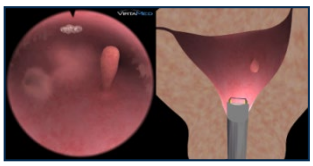
- Normally shaped uterus
- Small polyp located close to the fundus at the anterior wall
- Floating tissue parts, fluffy, stronger bleedings

## Polypectomy cases



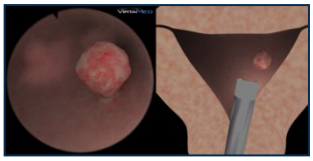
**Polypectomy easy 1**

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



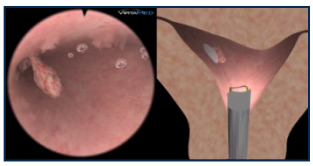
**Polypectomy easy 2**

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



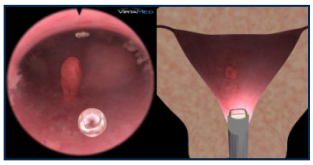
**Polypectomy easy 3**

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



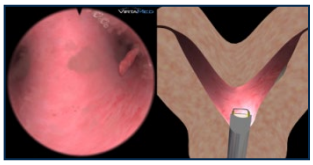
**Polypectomy easy 4**

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



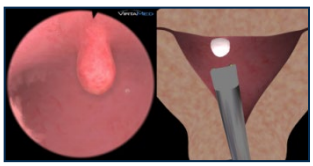
**Polypectomy medium 1**

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



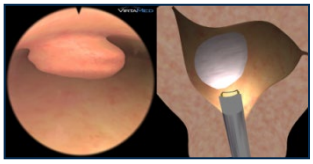
**Polypectomy medium 2**

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



**Polypectomy medium 3**

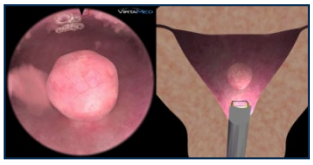
- Normally shaped uterus
- Medium-sized, sessile polyp with a broad base close to the fundus, in anterior position
- Almost clear view



**Polypectomy medium 4**

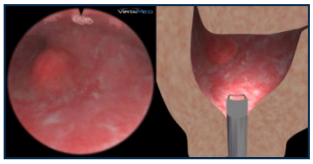
- Heavily distorted cavity, parous woman
- Large sessile polyp with a broad base blocking the right tubal opening, attached to the anterior wall
- Fluffy tissue

## Myomectomy cases



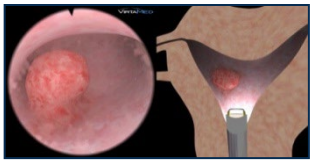
**Myomectomy medium 1**

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



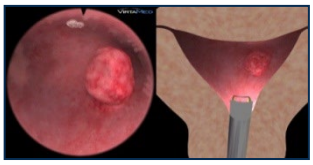
**Myomectomy medium 2**

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



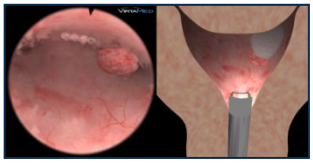
**Myomectomy medium 3**

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



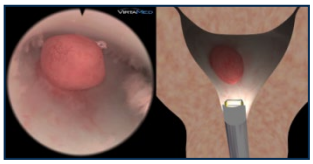
**Myomectomy medium 4**

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



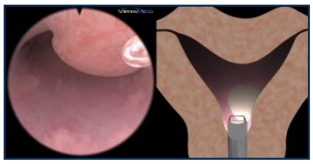
**Myomectomy difficult 1**

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



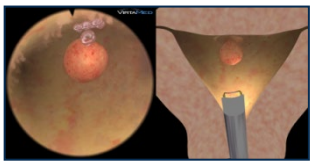
**Myomectomy difficult 2**

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



**Myomectomy difficult 3**

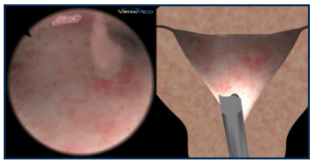
- Arcuate uterus
- Large myoma at the anterior wall partially blocking the entry from the cervical canal into the uterus
- Stronger bleeding, difficult entry



**Myomectomy difficult 4**

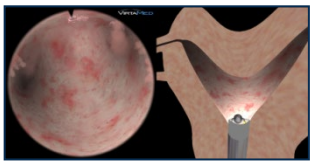
- Normally shaped uterus
- Small myoma at the fundus
- Little bleeding when entering the right ostia
- Few fluffy tissue parts

## Endometrium ablation cases



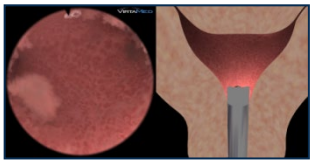
**Endometrium ablation medium 1**

- Normally shaped uterus
- No bleeding
- Easy access



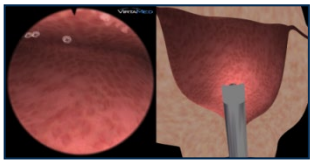
**Endometrium ablation medium 2**

- 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

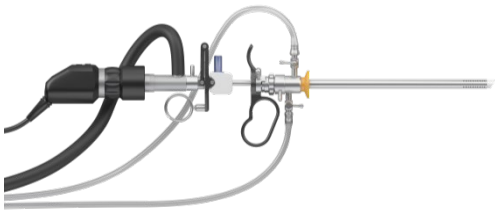
## Module description

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

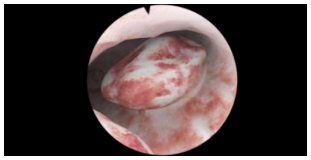
- To acquire advanced skills in hysteroscopy.
- To learn how to cope with multiple pathologies in one cavity.
- To work with the inflow and uterine distension to let intramural parts of myomas expand into the cavity.
- To distinguish adhesions and synechiae from a septum.
- To re-establish intact uterine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

## Instruments



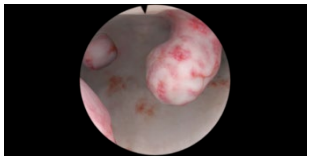
The module requires the same resectoscope as in the diagnostic and therapeutic module. Switching between the loop electrode and the needle electrode is performed within the simulation software.

## Advanced hysteroscopy cases



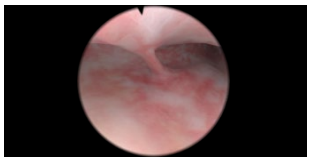
**Multiple polyps**

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



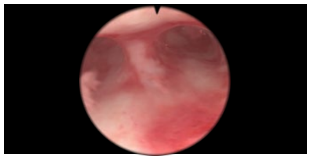
**Multiple myoma type I & II**

- 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

# MyoSure® tissue removal module

## Module description

Train on 16 virtual patients to correctly learn the MyoSure® tissue removal procedure. Each case requires the user to remove different types of growths in the uterus and handle complications such as bleeding. Through increasingly more difficult cases, users gain experience in correctly manipulating the MyoSure® device and scope, as well as the pressure pump.

## Learning objectives

- Perform a safe diagnostic hysteroscopy
- Recognize and safely remove intrauterine fibroids using a shaver
- Understand fluid management as it relates to a shaver
- Master angled optics, ergonomics and safety measures

## Instruments

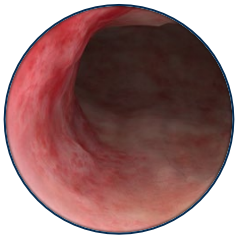
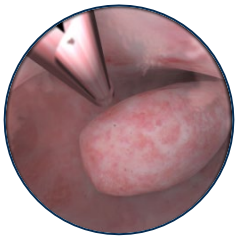
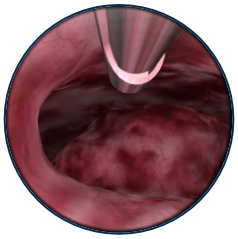
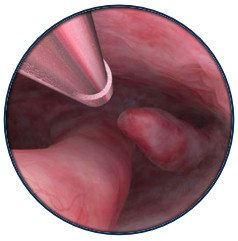
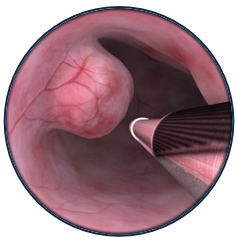
MyoSure device

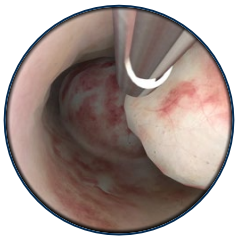
MyoSure scope


MyoSure foot pedal

## MyoSure® tissue removal cases

All training cases can be performed in guided or unguided mode, accompanying the user throughout their entire learning journey.

| | | |
|---|---|---|
|  | **Case 1**<br>• Normal shaped cavity<br>• Fluffy endometrium along right-side lateral wall | **Objectives**<br>• Orientation of MyoSure® device<br>• Importance of markings on both sides<br>• Smooth out fluffy tissue |
|  | **Case 2**<br>• Bicorne uterus with asymmetric tubal angles<br>• 3cm polyp in front of left tubal ostia, some fluffy endometrium | **Objectives**<br>• Handle bleedings<br>• Raise pressure to 80mmHg to clear field |
|  | **Case 3**<br>• Large size uterus<br>• 3-4cm polyp located on the posterior wall of the uterus<br>• No bleeding | **Objectives**<br>• Increasing pump pressure improves view of entire cavity<br>• Rotate the scope to improve the viewing angle of the polyp which is located on the posterior wall |
|  | **Case 4**<br>• Normal shaped cavity<br>• 4cm polyp extends into the cervical canal<br>• 3cm polyp at left tubal ostia | **Objectives**<br>• Use in-/outflow before inserting the device to clear bleeding<br>• Raise pressure to 100mmHg to tamponade bleeding<br>• Place device at distal lateral edge |
|  | **Case 5**<br>• 3cm myoma type II at the right lateral wall<br>• Dolphin pump is being used | **Objectives**<br>• Handling of pressure pump, e.g. Dolphin<br>• Understand correlation between vacuum and cutting performance<br>• Achieve distention |



**Case 6**

- 3cm myoma type I in front of left tubal ostia
- 1.5cm myoma type 0 at internal cervical os

**Objectives**

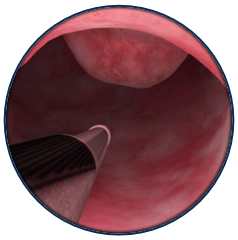
- Clear cavity with passive outflow when blade is closed
- Handle stronger bleedings

**Case 7**

- 4cm fundal myoma type I
- Retroverted uterine cavity

**Objectives**

- Appropriate way to approach and remove a fundal fibroid
- Tap on the foot pedal to clear an obscured view



**Case 8**

- 3cm fibroid type II located on the right lateral wall
- Anteverted uterine cavity

**Objectives**

- Manage bleeding by increasing pressure and tapping foot pedal
- Expulsion technique to facilitate removal of type II myoma

# Hysteroscopy Courses

## Essential Skills Training for Hysteroscopy

- Description: This essential skills training course covers the basic skills needed to perform a hysteroscopy with a diagnostic scope. This program includes visualization, bleeding control and tissue removal. Varying types and shapes of pathologies allow the trainees to gain experience in removing abnormal tissue with a grasper and micro scissors.
- Objective: This course is designed for novices in hysteroscopy. Learning topics include handling of a diagnostic scope with angled optics, recognition of pathologies as well as handling of graspers and scissors.

## Fundamentals of Hysteroscopic Surgery

- Description: This course covers diagnostic and therapeutic hysteroscopic skill training. The program includes polypectomy and myomectomy with the cutting loop and endometrium ablation with the rollerball. Varying pathologies and shapes of uterine cavities allow the trainee to gain experience using the angled optics and practice electro surgery in a safe environment.
- Objective: The participant should demonstrate the skills required to inspect the uterine cavity completely and describe visible pathologies. Establishing uterine distension and clear viewing conditions have to be mastered before the trainee can safely start resecting fibroids. Further skills required include efficient coagulation of bleeding sources and systematical ablation of the complete endometrial surface.

## Fundamentals of Hysteroscopic Surgery - Exam

- Description: This exam covers diagnostic and therapeutic hysteroscopic skill training. The program includes polypectomy and myomectomy with the cutting loop and endometrium ablation with the rollerball. Varying pathologies and shapes of uterine cavities allow the trainee to gain experience using the angled optics and practice electro surgery in a safe environment.
- Objective: The participant should demonstrate the skills required to inspect the uterine cavity completely and describe visible pathologies. Establishing uterine distension and clear viewing conditions have to be mastered before the trainee can safely start resecting fibroids. Further skills required include efficient coagulation of bleeding sources and systematical ablation of the complete endometrial surface.

## MyoSure Basic Skills

- Description: Gain more insight into how to operate the MyoSure tissue removal device and pump.
- Objective: Remove the tissue by regulating pump pressure and by using the correct positioning of the device.

## MyoSure Advanced Skills

- Description: Use advanced techniques to remove tissue, maintain proper intrauterine pressure, and manage bleeding.
- Objective: Use proper scope viewing and device positioning to remove tissue, manage the pump pressure properly to both maintain pressure and efficiently remove tissue.

# Intrauterine device (IUD) placement module

## Module description

Gynecology training for correct placement of IUDs along with cases for uterine sounding in anteverted or retroverted uteri. Available with or without the SimProctor™ guidance.

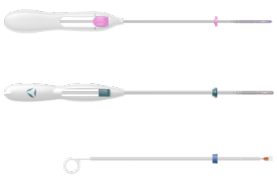
## SimProctor™ educational guidance

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. 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 learn each step of the procedure
- To safely sound different uteri (anteverted, retroverted or nulliparous cases)
- To correctly place an IUD, with or without visual guidance

## Instruments



IUD as purchased



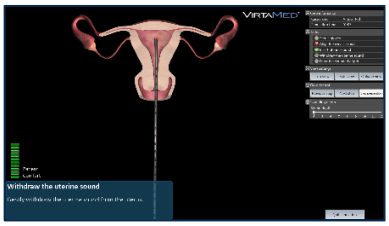
Uterine sound

Tenaculum

Speculum

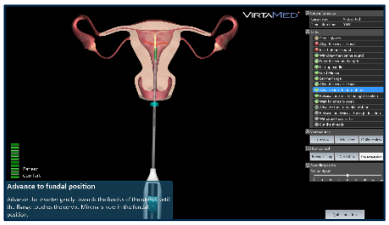
## IUD placement cases

All training cases can be performed guided or unguided, with anteverted, retroverted, and nulliparous uterus.



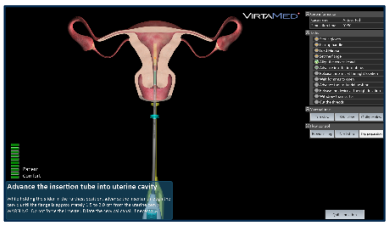

**Uterine sounding (3 cases)**

- Safely sound the uterine cavity and establish the correct length.




**IUD placement (12 cases)**

- Correctly place the IUD by closely following the official instructions given by the manufacturer.




**Uterine sounding and IUD placement (12 cases)**

- Perform the complete procedure.

# IUD Placement Courses

### Course 1: IUD Placement Skills Development – Anteverted Uterus

- Name: IUD Placement Skills Development – Anteverted Uterus
- Description: Learn how to deploy various IUDs in an anteverted uterus.
- Objective: To be able to use Kyleena and Paragard properly, understand the steps of deployment, and place the devices successfully in an anteverted uterus.

### Course 2: IUD Placement Skills Development – Retroverted Uterus

- Name: IUD Placement Skills Development – Retroverted Uterus
- Description: Learn how to deploy various IUDs in a retroverted uterus.
- Objective: To be able to use Kyleena and Paragard properly, understand the steps of deployment, and place the devices successfully in a retroverted uterus.

### Course 3: IUD Placement with Bayer Devices

- Name: IUD Placement Skills Development with Bayer Devices
- Description: Learn how to deploy various IUDs from Bayer both Anteverted and Retroverted uteri.
- Objective: To be able to use Kyleena, Skyla and Mirena properly, understand the steps of deployment, and place the devices successfully in both anteverted and retroverted uteri.

### Course 4: IUD Placement with Paragard Device

- Name: IUD Placement with Paragard Device
- Description: Learn how to deploy the Paragard device in both anteverted and retroverted uteri.
- Objective: To be able to use Paragard properly, understand the steps of deployment, and place the devices successfully in an anteverted and retroverted uterus.

# ASRM Embryo transfer module

## Module description

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. The module comes with a set of transfer and guide catheters, both tracked within the simulation.

## Learning objectives

- Perform the various embryo transfer techniques (direct, transfer with trial and afterload) as defined by the American Society for Reproductive Medicine (ASRM)
- Determine the best location for embryo expulsion based on either the ultrasound image or the uterine depth
- Train in your team to coordinate tasks, reduce patient risk, and minimize procedure time

## Instruments

Wallace® catheters*

Cook Guardia™ catheters**

IUI catheter*

Ultrasound transducer replica

Syringe

* Use Wallace® catheters and IUI catheter with the black and white sensors

** Use Cook Guardia™ catheters with the red and gray sensors

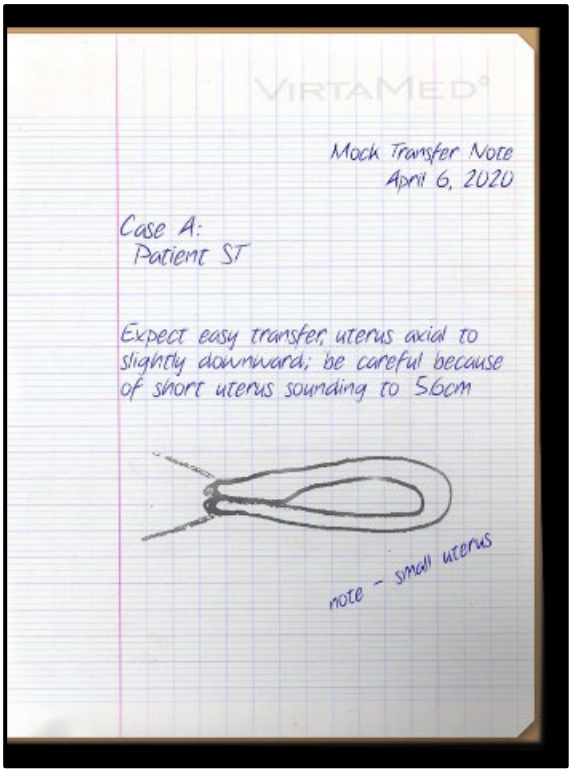
## Case A1: Axial Uterus

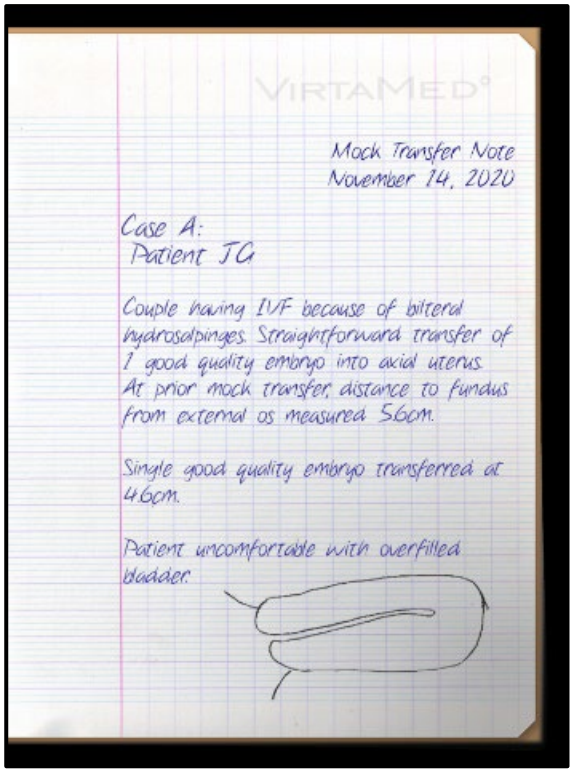
Learning objectives:

- Learn the different embryo transfer procedure options
- Very short uterine depth. Designed to teach new practitioners to use ultrasound and sounded depth to avoid touching the fundus.

Canal navigation tips:

- Easy canal. No tips necessary.



## Case B: Anteverted Uterus

Learning objectives:

- To learn how to navigate a slightly more challenging canal
- To introduce the pros and cons of leading with either the inner or outer catheter.

Canal navigation tips:

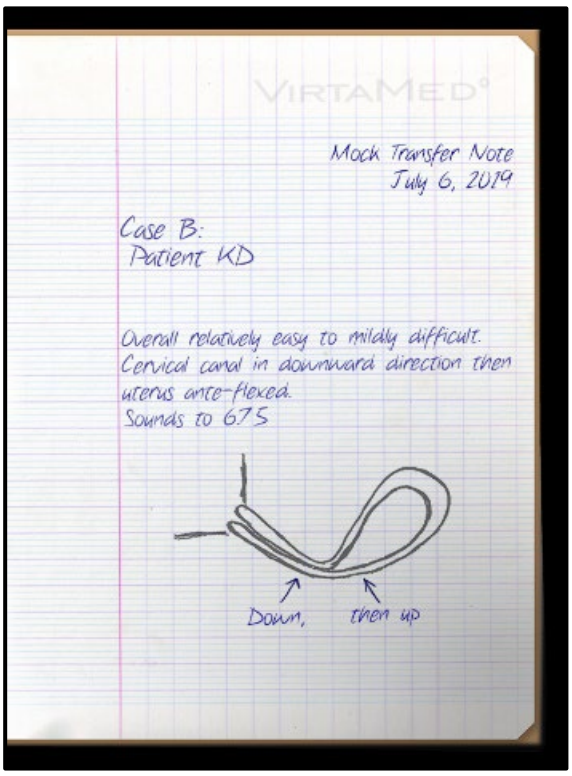
- There is a sharp ante-flex bend at the internal os

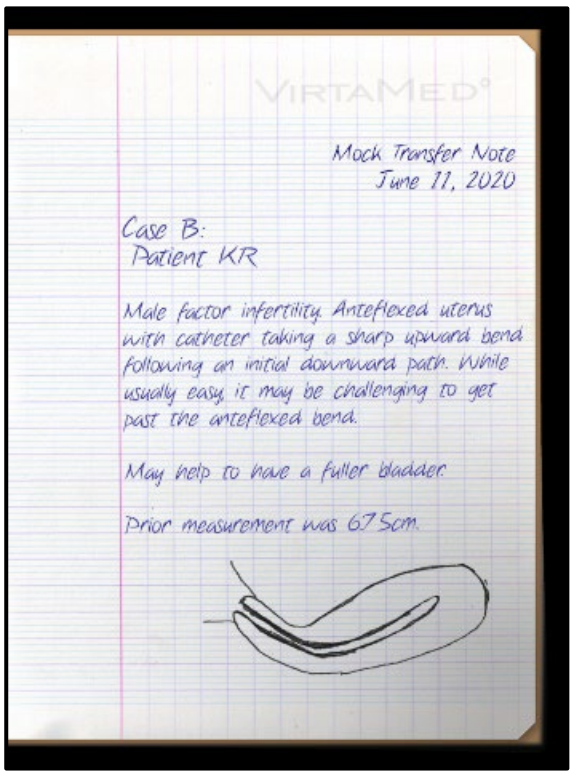
Option 1:

- Lead with 2+ cm of the inner catheter.
- You will feel a small amout of resistance at the internal os but should be able to easily push the inner catheter past it and into the uterine cavity.

Option 2:

- Lead with the outer catheter.
- Place a 30 degree bend in the catheter. (***Wallace only***)
- When you reach the inner os, scoop the catheter into the uterine cavity.



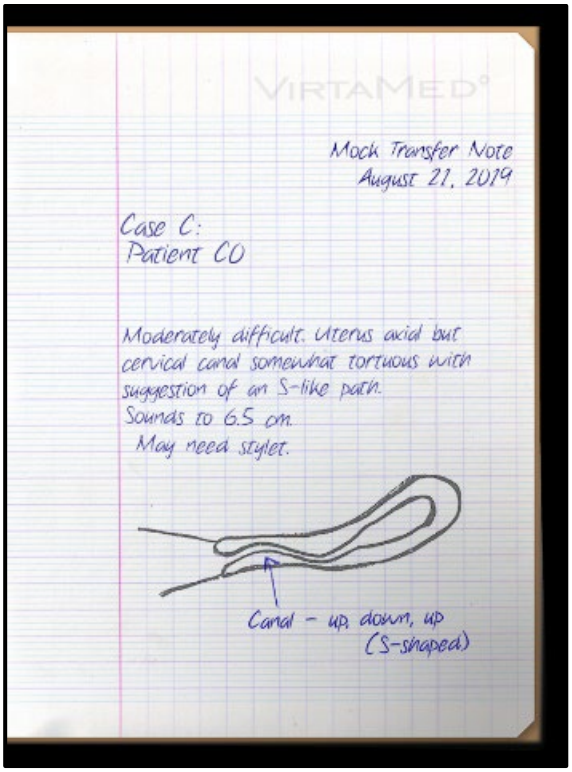
## Case C: Tortuous Canal

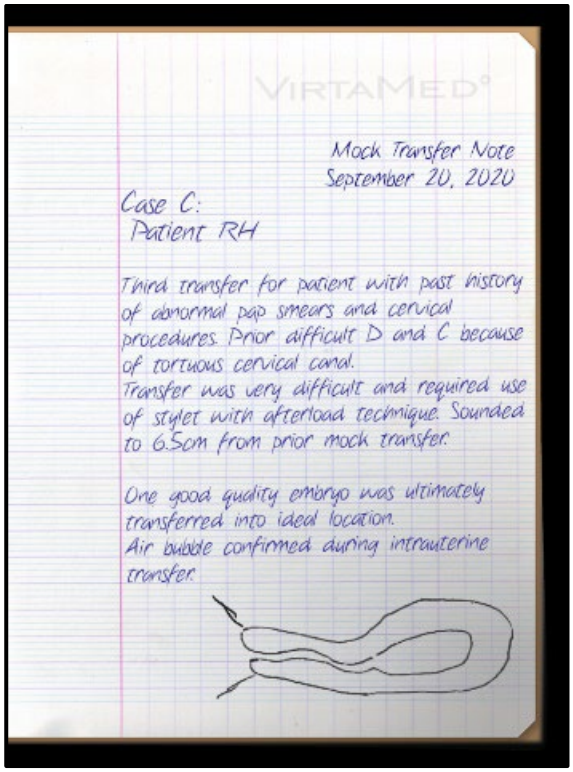
Learning objectives:

- To learn to gently use a bent catheter to navigate a tortuous canal.
- To demonstrate the differences when navigating with either the inner or outer catheter.
- Canal navigation tips:
- This is a tortuous canal that bends first up and then down.

Option 1:

- Lock the catheters together to lead with as much soft catheter as available in front.
- Very slowly and steadily guide the inner catheter through the external os.
- Continue to slide the inner catheter through the cervical canal, watching to see that it does not buckle outside the patient.



Option 2:

- Place a 30 degree bend in the catheter/stylet starting approximate 2 cm from the tip. (***Wallace only***)
- Guide the catheter through the external os in an upward scoop.
- Slowly and gently rotate the catheter 180 degrees following the cervical canal. You should feel little resistance.
- Continue to rotate the catheter through the next bend until you reach the internal os. This second bend will be slightly more difficuly to navigate.

Option 3:

- Use a stylet. Insert the stylet in the guide catheter.
- Then place a bend in the catheter/stylet and navigate the canal as described above. Be sure that you are rotating the stylet instead of the catheter.

## Case D2: Ridge and False Passage

Learning objectives:

- To identify, both haptically and using ultrasound guidance, when the catheter tip is in a false passage.
- To learn different techniques to navigate around a false passage and into the uterine cavity.

Canal navigation tips:

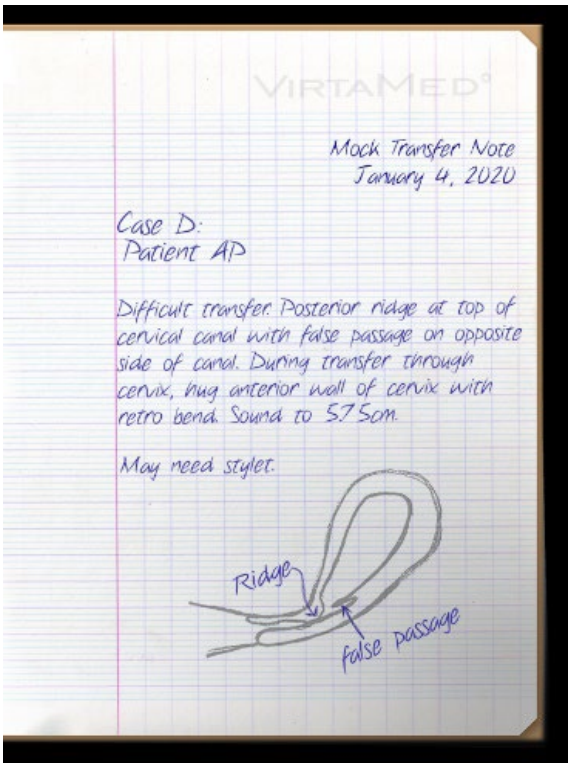
- Due to the shape of the canal, the catheter tip is naturally guided into the false passage.
- Great opportunity to demonstrate the benefits of the afterload technique.

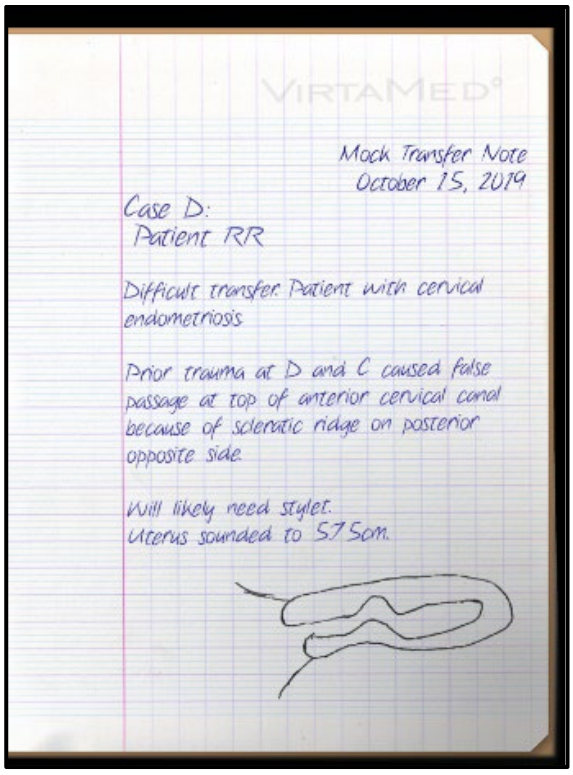
Option 1:

- Place a 10 degree bend in the catheter. (***Wallace only***)
- Lead with the guide catheter. Guide the catheter through the external os in an upward scoop.
- Rotate the catheter 180 degrees to navigate the tip over the ridge and past the false passage.

Option 2:

- Perform the steps above using a stylet. Be sure to rotate the stylet instead of the catheter.



## Case E: Retroverted Uterus

Learning objectives:

- To identify, both haptically and using ultrasound guidance, the retroverted uterus.
- To learn different techniques to navigate past any resistance caused by the endometriosis.

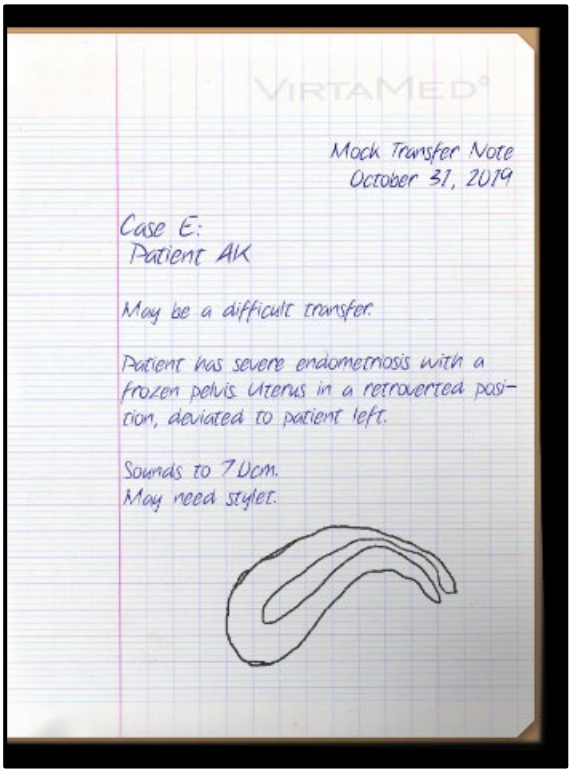
Canal navigation tips:

Option 1:

- Lead with 1+ cm of the soft catheter.
- Gently slide the guide or soft catheter as necessary to move past any resistance.

Option 2:

- Insert a soft stylet into the guide catheter.
- Place a 20 degree end in the catheter/stylet. (Wallace only)
- Gently navigate until you have passed the internal os. Rotate the stylet conservatively, as needed.



## ASRM Embryo Transfer Courses

Courses coincide with ASRM's Guide to Learning. This guide can be found on your desktop or contact VirtaMed to have a copy sent to you. Chapter 1 of that guide is an introduction to the embryo transfer procedure and simulator, so there is no associated course. Chapter 5 is a video review of challenges cases

### Name: ASRM Basics (Lesson 2)

- Description: Successfully perform the direct transfer technique, twice, on cases A and B
- Objective: Learn to employ the Direct Transfer technique for performing straight forward embryo transfers

### Name: ASRM Trial Transfer (Lesson 3)

- Description: Successfully perform the Trial Transfer technique, twice, on cases A and B
- Objective: Learn to employ the Trial Transfer technique for performing straight forward embryo transfers

### Name: ASRM Afterload Transfer (Lesson 4)

- Description: Successfully perform the Afterload technique on cases A and B, including converting to afterload from Trial Transfer
- Objective: Learn to employ the Afterload technique for performing straight forward embryo transfers. Learn to convert a Trial Transfer technique to Afterload.

### Name: ASRM Difficult cases (Lesson 6)

- Description: Successfully perform embryo transfer on challenging cases
- Objective: Learn techniques to perform embryo transfer in patients with cervical canal anomalies such as a tortuous canal, a false passage and a cervical wall obstruction

### Name: ASRM Unguided practice (Lesson 7; Activity 2)

- Description: Perform embryo transfer successfully twice for cases A-E without using ultrasound or the cartoon view.
- Objective: To refine skills for expelling embryos at the ideal uterine location.

# Transabdominal obstetric ultrasound module

## Module description

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. Training with the highest realism, the transabdominal transducer can be moved freely across the entire abdomen to visualize the fetus.

## Learning objectives

- To perform a systematic second-trimester ultrasound exam using the 20+2 approach
- To gain an understanding of what the normal ultrasound appearances are in each plane
- To detect and diagnose vascular complications using doppler imaging
- To practice caliper placement for measurement of the gestational age

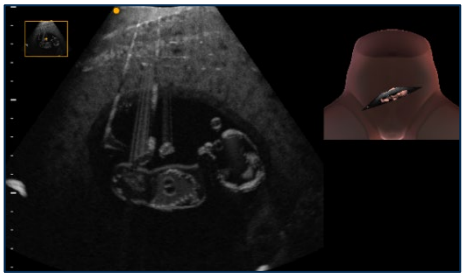
## Instruments

Transabdominal ultrasound transducer

Small abdomen for fetuses younger than 18 weeks. Cases are only active when the correct abdomen is used.

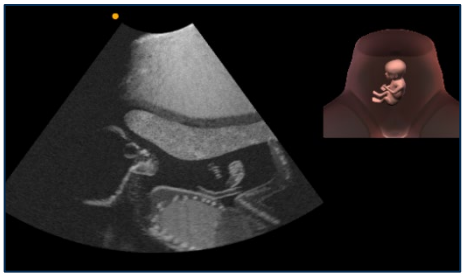
Large abdomen for fetuses older than 18 weeks. Cases are only active when the correct abdomen is used.

## Transabdominal obstetric ultrasound: patients



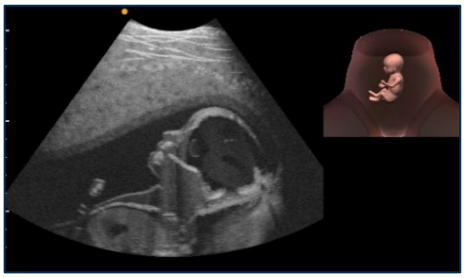
**Patient 1 “Angelique”**

- Fetal age: 14 weeks 3 days
- Fetal position: Cephalic
- Placental location: Fundal
- Amniotic fluid: Normal
- Diagnosis: Normal pregnancy
- Belly size to use: Small
- Gender: Female



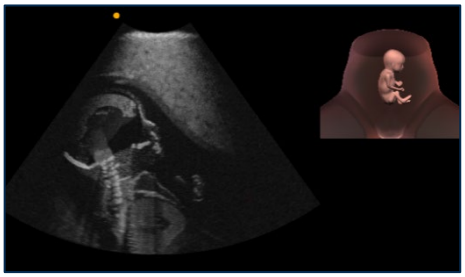
**Patient 2 “Yuki”**

- Fetal age: 20 weeks 0 days
- Fetal position: Breech, spine left
- Placental location: Right
- Amniotic fluid: Normal
- Diagnosis: Normal pregnancy
- Belly size to use: Large
- Gender: Female



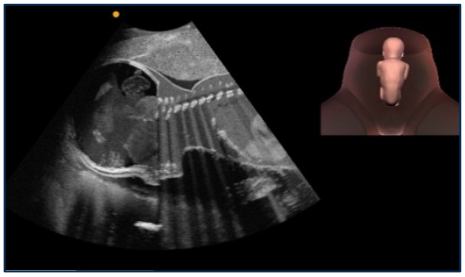
**Patient 3 “Jada”**

- Fetal age: 19 weeks 5 days
- Fetal position: Breech
- Placental location: Low anterior
- Amniotic fluid: Normal
- Diagnosis: Normal pregnancy
- Belly size to use: Large
- Gender: Male



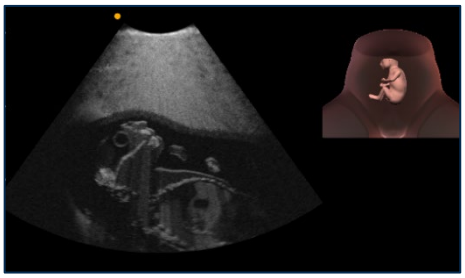
**Patient 4 “Ellie”**

- Fetal age: 20 weeks 4 days
- Fetal position: Breech
- Placental location: Posterior
- Amniotic fluid: Normal
- Diagnosis: Normal pregnancy
- Belly size to use: Large
- Gender: Male



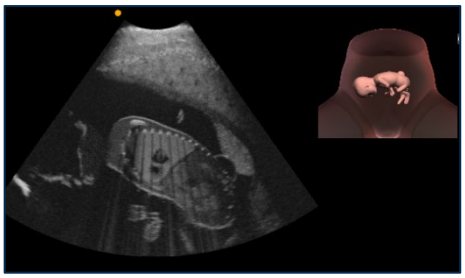
**Patient 5 “Sofia”**

- Fetal age: 25 weeks 5 days
- Fetal position: Breech
- Placental location: Anterior fundal
- Amniotic fluid: Normal
- Diagnosis: Normal pregnancy
- Belly size to use: Large
- Gender: Female



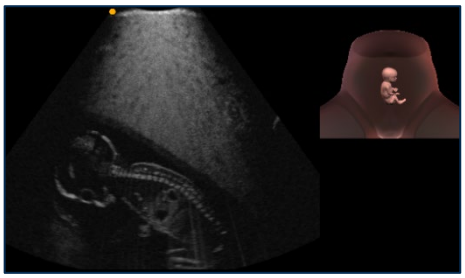
**Patient 6 “Deirdre”**

- Fetal age: 21 weeks 0 days
- Fetal position: Breech
- Placental location: Low posterior
- Amniotic fluid: Normal
- Diagnosis: Anencephaly
- Belly size to use: Large
- Gender: Male



**Patient 7 “Annabelle”**

- Fetal age: 21 weeks 3 days
- Fetal position: Transverse
- Placental location: Fundal
- Amniotic fluid: Normal
- Diagnosis: Spina bifida
- Belly size to use: Large
- Gender: Male

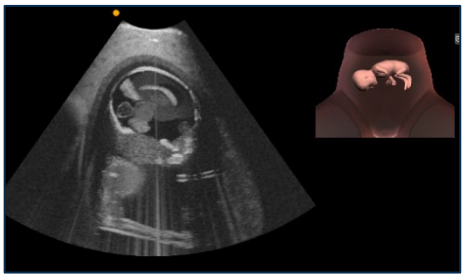


**Patient 8 “Femi”**

- Fetal age: 17 weeks 0 days
- Fetal position: Breech, spine right
- Placental location: Posterior fundal
- Amniotic fluid: Normal
- Diagnosis: Miscarriage
- Belly size to use: Small
- Gender: Male

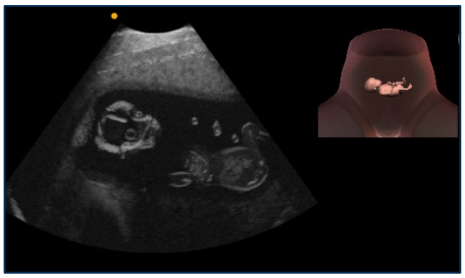
**Patient 9 “Priya”**

- Fetal age: 24 weeks 0 days
- Fetal position: Breech, spine up
- Placental location: Posterior
- Amniotic fluid: Low
- Diagnosis: Renal agenesis
- Belly size to use: Large
- Gender: Male



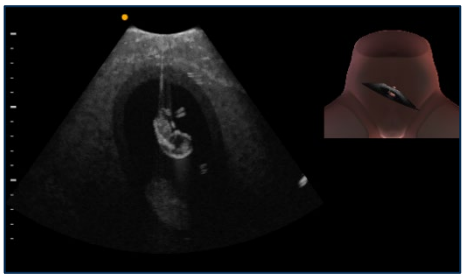
**Patient 10 “Taylor”**

- Fetal age: 21 weeks 3 days
- Fetal position: Transverse, spine up
- Placental location: Placenta previa
- Amniotic fluid: Normal
- Diagnosis: Normal pregnancy
- Belly size to use: Large
- Gender: Female



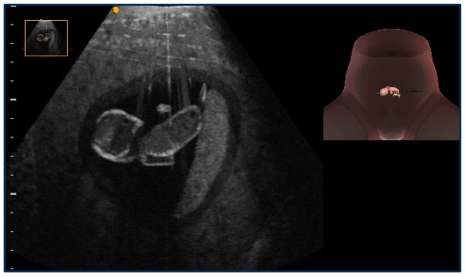
**Patient 11 “Tiara”**

- Fetal age: 16 weeks 5 days
- Fetal position: Transverse, back
- Placental location: Fundal
- Amniotic fluid: Normal
- Diagnosis: Down syndrome
- Belly size to use: Small
- Gender: Female



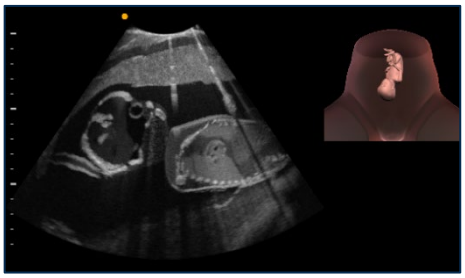
**Patient 12 “Ursula”**

- Fetal age: 10 weeks 5 days
- Fetal position: Cephalic
- Placental location: Posterior, right
- Amniotic fluid: Normal
- Diagnosis: Normal pregnancy
- Belly size to use: Small
- Gender: Female



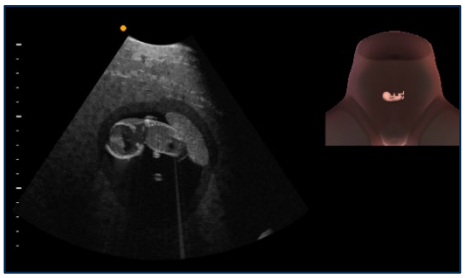
**Patient 13 “Lucy”**

- Fetal age: 12 weeks 2 days
- Fetal position: Transverse
- Placental location: Left
- Amniotic fluid: Normal
- Diagnosis: Normal pregnancy
- Belly size to use: Small
- Gender: Male



**Patient 14 “Olivia”**

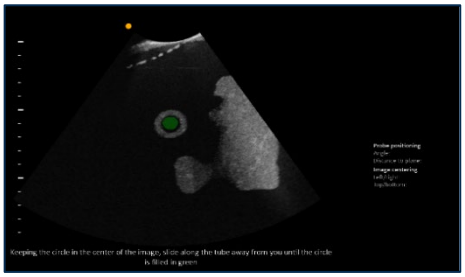
- Fetal age: 19 weeks 4 days
- Fetal position: Cephalic
- Placental location: Low lying anterior
- Amniotic fluid: Normal
- Diagnosis: Cleft lip
- Belly size to use: Large
- Gender: Female



**Patient 15 “Kiki”**

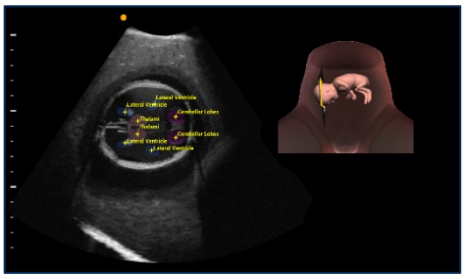
- Fetal age: 12 weeks 2 days
- Fetal position: Transverse
- Placental location: Anterior
- Amniotic fluid: Normal
- Diagnosis: Down syndrome
- Belly size to use: Small
- Gender: Male

## Transabdominal obstetric ultrasound: cases



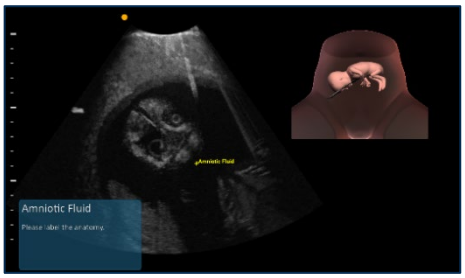
### Basic Skills – Probe handling

- Learning objectives:
- Slide, rotate and tilt the probe to visualize shapes
- Sweep through objects in the abdominal space to understand how probe movements affect the image on the screen



### Basic Skills – Anatomical planes

- Learning objectives:
- Learn the 20 important planes in the mid-trimester fetus
- Use training features such as control lights, the outside view, and anatomy labels to guide you

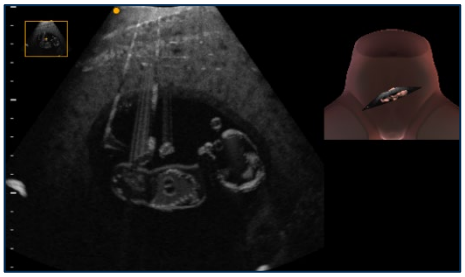



### Basic Skills – Anatomies Identification

- Learning objectives:
- Navigate to randomized anatomical structures and check the accuracy of your assessment

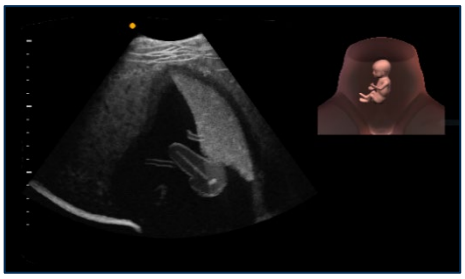
**6-Steps approach**

- Learning objectives:
- Assess the fetal lie
- Identify placental location
- Measure amniotic fluid volume
- Visualize cardiac activity
- Perform biometric measurements based on the Hadlock scale
- All training cases include one fetus only (multiple pregnancies are not simulated)



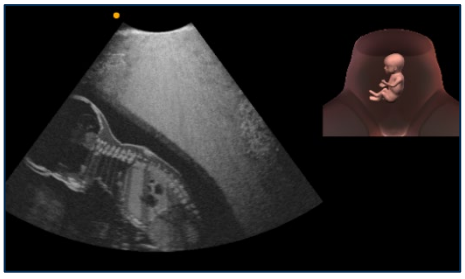
**11-14 Weeks exam**

- Learning objectives:
- Perform the 6-steps approach exam as described above
- Measure nuchal translucency



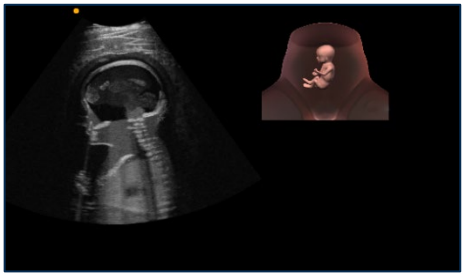
**Free roam**

- Learning objectives:
- Navigate the different structures of the fetus according to your needs
- Recognize signs of abnormalities including placenta previa
- Perform fetal biometry



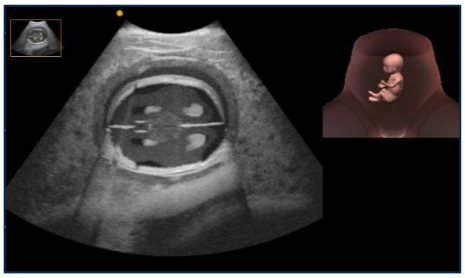
**Spine**

- Learning objectives:
- Identify and document the 3 planes of the fetal spine: spine in sagittal, spine in coronal, and the coronal section of the body
- Check for any spinal or skin defects including spina bifida meningocele



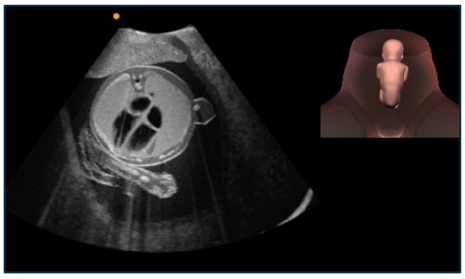
**20+2 planes**

- Learning objectives:
- Navigate to the 20 important planes in the mid-trimester fetus
- Identify the key structures within these planes
- Recognize signs of abnormalities including bilateral renal agenesis, miscarriage, and Down syndrome
- Perform fetal biometry



**Brain**

- Learning objectives:
- Navigate to the 3 important planes of the brain: transventricular, transthalamic, and transcerebellar
- Identify the key structures within these planes such as the falx, ventricles, and cavum septum pellucidum
- Recognize signs of abnormalities of the brain including anencephaly, lemon-shaped scull, and banana-shaped cerebellum
- Perform fetal biometry of the brain

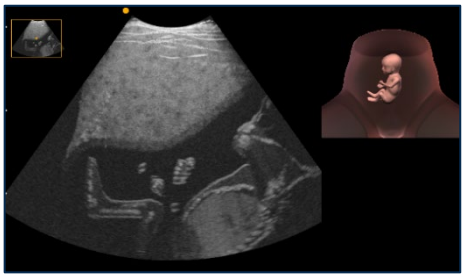


**Heart and thorax**

- Learning objectives:
- Identify the key structures in the fetal heart such as the four-chamber view with lungs, RVOT, and LVOT
- Identify right and left side of the fetal situs
- Perform fetal biometry of the fetal heart based on the Hadlock scale
- Recognize signs of abnormalities of the heart including the ventricular septum defect

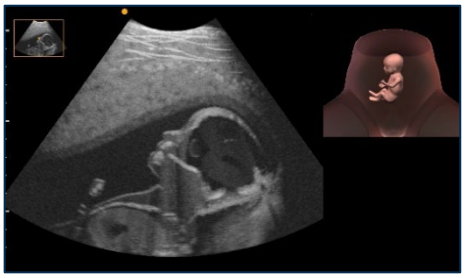
**Abdomen and pelvis**

- Learning objectives:
- Identify the key structures within the fetal abdomen and pelvis such as the stomach and kidneys
- Recognize signs of abnormalities of the abdomen including bilateral renal agenesis



**Limbs**

- Learning objectives:
- Identify the key structures of fetal limbs such as the femur, tibia, and fibula
- Identify right and left side of the fetus
- Perform fetal biometry
- Recognize signs of abnormalities of the limbs including the sandal gap



**Face**

- Learning objectives:
- Identify the key structures of fetal face such as the facial profile, lips, eyes, and nose
- Recognize signs of abnormalities of the face including missing nasal bone

## Patient overview

| Module | Angelique | Yuki | Jada | Ellie | Sofia | Deirdre | Annabelle |
|---|---|---|---|---|---|---|---|
| **6-Steps** | - | Case 9 | Case 1 | Case 6 | Case 8 | - | Case 4 |
| **11-14 Weeks** | Case 3 | - | - | - | - | - | - |
| **Free Roam** | Case 1 | Case 2 | Case 3 | Case 4 | Case 5 | Case 6 | Case 7 |
| **20+2** | - | - | - | Case 3 | Case 6 | - | Case 4 |
| **20+2 Testing** | Case 3 | Case 1 | Case 12 | Case 7 | Case 10 | Case 8 | Case 9 |
| **Spine** | Case 8 | - | - | Case 9 | Case 7 | Case 1 | Case 2 |
| **Brain** | - | Case 2 | Case 1 | Case 7 | Case 5 | - | Case 6 |
| **Heart** | Case 6 | Case 8 | Case 3 | Case 5 | Case 2 | Case 11 | Case 9 |
| **Abdomen** | - | Case 8 | Case 10 | Case 7 | Case 1 | Case 4 | Case 3 |
| **Limbs** | Case 10 | Case 6 | Case 2 | Case 1 | Case 4 | Case 7 | Case 9 |
| **Face** | Case 5 | Case 1 | Case 4 | Case 3 | Case | Case 8 | Case 7 |

| Module | Femi | Priya | Taylor | Tiara | Ursula | Lucy | Olivia | Kiki |
|---|---|---|---|---|---|---|---|---|
| **6-Steps** | Case 5 | Case 10 | Case 7 | Case 2 | - | - | Case 3 | |
| **11-14 Weeks** | - | - | - | - | Case 2 | Case 1 | | Case 4 |
| **Free Roam** | Case 8 | Case 9 | Case 10 | Case 11 | Case 12 | Case 13 | Case 14 | Case 15 |
| **20+2** | - | Case 5 | Case 1 | Case 2 | - | - | - | |
| **20+2 Testing** | Case 2 | Case 4 | Case 11 | Case 6 | - | - | Case 5 | |
| **Spine** | Case 6 | Case 5 | Case 4 | Case 3 | - | - | - | |
| **Brain** | Case 4 | Case 9 | Case 3 | Case 8 | - | - | - | |
| **Heart** | Case 4 | Case 1 | Case 10 | Case 7 | - | - | - | |
| **Abdomen** | Case 9 | Case 6 | Case 2 | Case 5 | - | - | - | |
| **Limbs** | Case 11 | Case 8 | Case 5 | Case 3 | - | - | - | |
| **Face** | Case 6 | - | - | Case 2 | - | - | - | |

# Transabdominal Ultrasound Courses

## Transabdominal Fetal Ultrasound - Essential Skills

- Description: Gain more insight into probe manipulation, fetal navigation, and identification of important fetal structures.
- Objective: Familiarize yourself with probe handling, navigating the fetus, identification of important fetal structures, and gaining a systematic understanding for how to view fetal structures.

Cases:

1. Introduction to the simulator (video)
2. Probe handling 1
3. Probe handle 2
4. Probe handling 3
5. Anatomical planes 1
6. Anatomical identification 1
7. Anatomical planes 2
8. Anatomical identification 2
9. Try the 20+2 approach

## Transabdominal Fetal Ultrasound - Basic Exam

- Description: Using the 6-steps approach practice your basic ultrasound probe manipulation and fetal navigation skills.
- Objective: Navigate the fetus, establish fetal lie, establish placental location, and practice biometry.

| | |
|---|---|
| Case 1: | Free Roam to explore the simulator and an initial case. |
| Cases 2-7: | 6 steps approach, guided. All cases are heathy fetuses. |
| Cases 8-11: | 6 steps approach exam. 3 cases contain anomalies. |

## Transabdominal Fetal Ultrasound - 11 to 14 Week Examination

- Description: Learn the specifics of a fetal examination in this age range by taking fetal biometry and learning to detect early developmental anomalies.
- Objective: Learn to navigate the fetus, take fetal measurements, detect early fetal anomalies

  Case 1: Free Roam to explore the simulator and an initial case.

  Cases 2-7: 11-14 weeks, guided. All cases are heathy fetuses.

  Cases 8-10: 11-14 weeks exam. 1 case contains anomalies.

## Transabdominal Fetal Ultrasound - 20+2 Planes Approach for Beginners

- Description: Learn the 20+2 Approach in a systematic way by using the simulator's teaching tools.
- Objective: Learn to navigate the fetus systematically and exclude fetal abnormalities.

Basic Training:

- Case 1: Free Roam to explore the simulator and an initial case.
- Case 2: Anatomical planes

Anatomical planes Training (all patients are normal pregnancies)

- Spine
- Brain
- Heart
- Abdomen
- Limbs
- Face
- Full 20+2

Exam:

- Anatomical planes (Previa)
- 20+2 Training (Spina Bifida)
- 20+2 Training (Previa)
- 20+2 Testing (Spina Bifida)

# Transvaginal obstetric ultrasound module

## Module description

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.

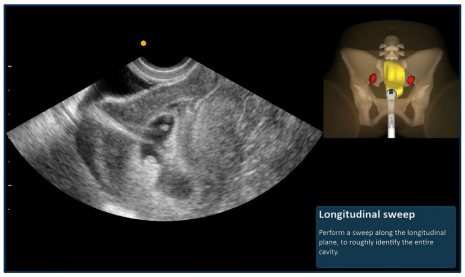
## Learning objectives

- To perform a systematic first-trimester ultrasound exam
- To visualize and assess uterine and pregnancy structures
- To practice caliper placement for measurement of the gestational age

## Instruments

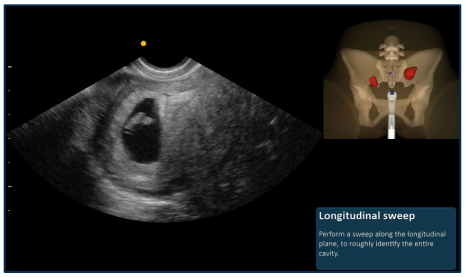
Transvaginal ultrasound probe

## Transvaginal obstetric ultrasound: guided cases



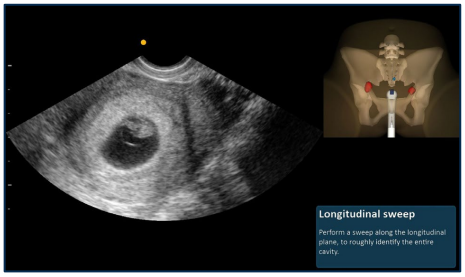

**Patient 1 “Chante”**

- Pregnancy classification: Early pregnancy loss
- Number of embryos: 1
- Actual gestational age: 6w, 6d
- EGA based on LMP: 6w, 6d
- Landmarks not possible to visualize: All are possible to visualize.
- Previous pregnancies: 1 Gravida, 0 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: N/A



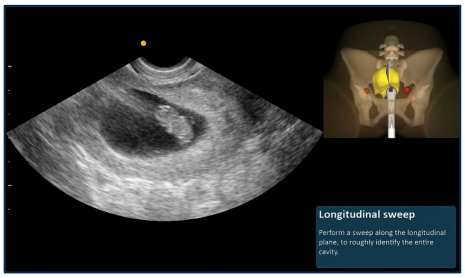

**Patient 2 “Akira”**

- Pregnancy classification: Definite intrauterine pregnancy
- Number of embryos: 1
- Actual gestational age: 7w, 1d
- EGA based on LMP: 6w, 3d
- Landmarks not possible to visualize: All are possible to visualize.
- Previous pregnancies: 3 Gravida, 2 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: N/A



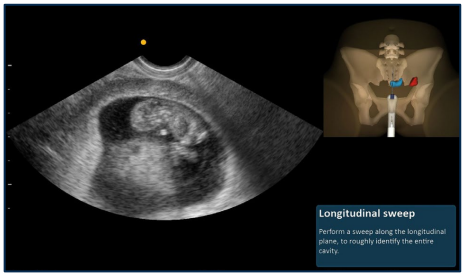

**Patient 3 “Galia”**

- Pregnancy classification: Definite intrauterine pregnancy
- Number of embryos: 1
- Actual gestational age: 8w, 1d
- EGA based on LMP: 8w, 1d
- Landmarks not possible to visualize: All are possible to visualize.
- Previous pregnancies: 1Gravida, 0 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: N/A




**Patient 4 “Jasmine”**

- Pregnancy classification: Definite intrauterine pregnancy
- Number of embryos: 1
- Actual gestational age: 9w, 1d
- EGA based on LMP: 9w, 1d
- Landmarks not possible to visualize: All are possible to visualize.
- Previous pregnancies: 1 Gravida, 0 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: Nabothian cysts on cervix

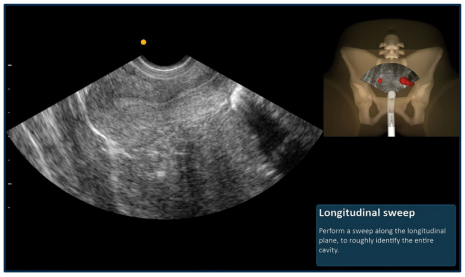



**Patient 5 “Sasha”**

- Pregnancy classification: Definite intrauterine pregnancy
- Number of embryos: 1
- Actual gestational age: 10w
- EGA based on LMP: 13w, 2d
- Landmarks not possible to visualize: All are possible to visualize.
- Previous pregnancies: 3 Gravida, 1 Para, 1 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: N/A

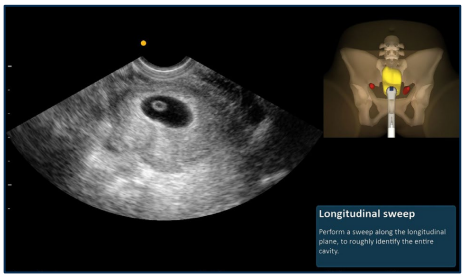

**Patient 6 “Riley”**

- Pregnancy classification: Definite intrauterine pregnancy
- Number of embryos: 1
- Actual gestational age: 12w, 1d
- EGA based on LMP: 11w, 5d
- Landmarks not possible to visualize: Yolk sac is not present.
- Previous pregnancies: 2 Gravida, 1 Para, 1 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: N/A



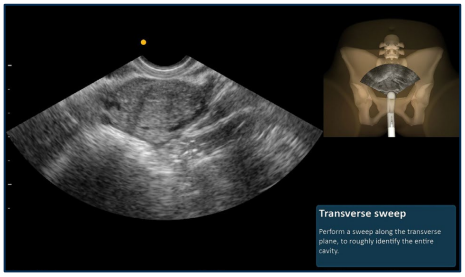

**Patient 7 “Noel”**

- Pregnancy classification: Pregnancy of unknown location
- Number of embryos: 0
- Actual gestational age: Unknown
- EGA based on LMP: 5w, 5d
- Notes: Pregnancy of unknown location. Patient could not be pregnant despite positive pregnancy test.
- Landmarks not possible to visualize: Gestational sac, embryo/fetus, yolk sac, and cardiac activity not present.
- Previous pregnancies: 1 Gravida, 0 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: History of irregular menses, weekly positive pregnancy test



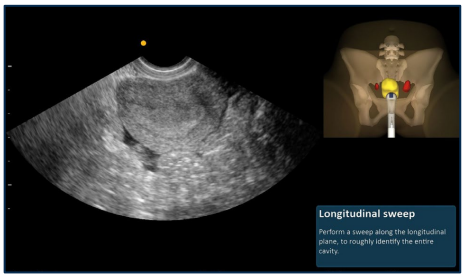

**Patient 8 “Dakota”**

- Pregnancy classification: Early pregnancy loss (based on history only)
- Number of embryos: 0
- Actual gestational age: approx. 7w, 3d
- EGA based on LMP: 8w, 4d
- Notes: Spontaneous abortion, mean sac diameter measures at approx. 7w 3d, minimal grow since last ultrasound.
- Landmarks not possible to visualize: Embryo/fetus not present. No cardiac activity is present.
- Previous pregnancies: 2 Gravida, 1 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: Yes, scanned 2 weeks ago at 6w, 6d
- Recent medical history: Irregular cycle, duration from 24-42 days, patient has experienced bleeding since last ultrasound



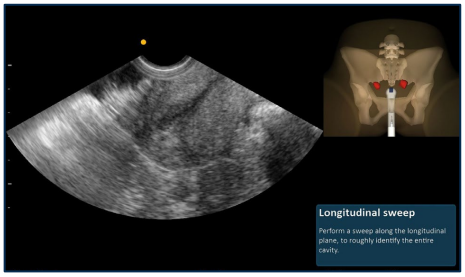

**Patient 9 “Odalis”**

- Pregnancy classification: Pregnancy of unknown location
- Number of embryos: 0
- Actual gestational age: Unknown
- EGA based on LMP: Unknown
- Notes: Pregnancy of unknown location with a mass in the left adnexa indicating a possible ectopic pregnancy.
- Landmarks not possible to visualize: Gestational sac, embryo/fetus, yolk sac, and cardiac activity are not present.
- Previous pregnancies: 1 Gravida, 0 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: Positive pregnancy test




**Patient 10 “Kiana”**

- Pregnancy classification: Pregnancy of unknown location
- Number of embryos: 0
- Actual gestational age: Unknown
- EGA based on LMP: Unknown
- Notes: Pregnancy of unknown location with a mass in the left adnexa indicating a possible ectopic pregnancy.
- Landmarks not possible to visualize: Gestational sac, embryo/fetus, yolk sac, and cardiac activity not present.
- Previous pregnancies: 1 Gravida, 0 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: Positive pregnancy test




**Patient 11 “Imani”**

- Pregnancy classification: Pregnancy of unknown location
- Number of embryos: 0
- Actual gestational age: Unknown
- EGA based on LMP: Unknown
- Notes: Signs of ectopic pregnancy, fluid in the cul-de-sac, echolucent/sonolucent fluid or blood in the uterus
- Landmarks not possible to visualize: gestational sac, embryo/fetus, yolk sac, and cardiac activity are not present.
- Previous pregnancies: 1 Gravida, 0 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: Positive pregnancy test


**Patient 12 “Marina”**

- Pregnancy classification: Ectopic
- Number of embryos: Multiple
- Actual gestational age: 8w 4d
- EGA based on LMP: 7w, 4d
- Notes: Visible ectopic twins. One embryo has a visible crown-rump length (CRL), which is measurable at 8w, 4d. The other embryo is not easily visualized. Gestational sac cannot be measured correctly.
- Landmarks not possible to visualize: All are possible to visualize.
- Previous pregnancies: 1 Gravida, 0 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: Positive pregnancy test

**Patient 13 “Vanessa”**

- Pregnancy classification: IUP
- Number of Embryos: 0
- Gestational age and/or related notes: 5week 3 days
- Landmarks not possible to visualize: none
- EGA based on LMP: 5 weeks
- Previous Pregnancies: 3
- Previous ultrasound for current pregnancy: no
- Recent Medical history: none

**Patient 14 “Toni”**

- Pregnancy classification: IUP
- Number of Embryos: 1
- Gestational age and/or related notes: 9 weeks 2 days
- Landmarks not possible to visualize: bicornuate is only seen in transverse plane
- EGA based on LMP: 9 weeks 6 days
- Previous Pregnancies: none
- Previous ultrasound for current pregnancy: no
- Recent Medical history: none

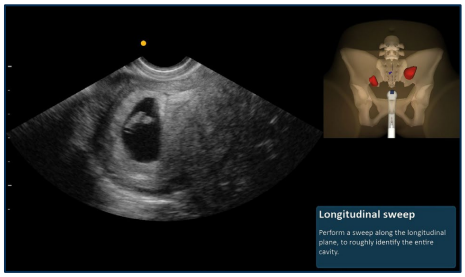
**Patient 15 “Katy”**

- Pregnancy classification: IUP/Possible Molar Pregnancy
- Number of Embryos: 1
- Gestational age and/or related notes: 7 weeks 3 days
- Landmarks not possible to visualize: clear endometrium (stripe), no cardiac
- EGA based on LMP: 8 weeks 5 days
- Previous Pregnancies: 3
- Previous ultrasound for current pregnancy: none
- Recent Medical history: severe N/V, and spotting

**Patient 16 “Mei”**

- Pregnancy classification: Possible ectopic
- Number of Embryos: 0
- Gestational age and/or related notes: 7 weeks 4 days
- Landmarks not possible to visualize: none
- EGA based on LMP: 7 weeks 4 days
- Previous Pregnancies: None
- Previous ultrasound for current pregnancy: none
- Recent Medical history: intermittent light bleeding and cramping x 2 weeks

## Transvaginal obstetric ultrasound: testing mode

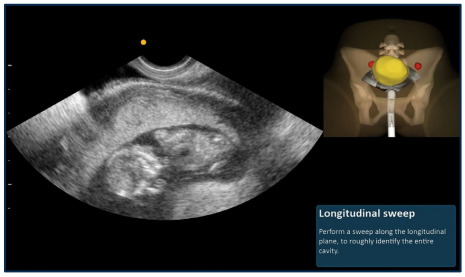



**Patient 1 “Akira”**

- Pregnancy classification: Definite intrauterine pregnancy
- Number of embryos: 1
- Actual gestational age: 7w, 1d
- EGA based on LMP: 6w, 3d
- Landmarks not possible to visualize: All are possible to visualize.
- Previous pregnancies: 3 Gravida, 2 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: N/A

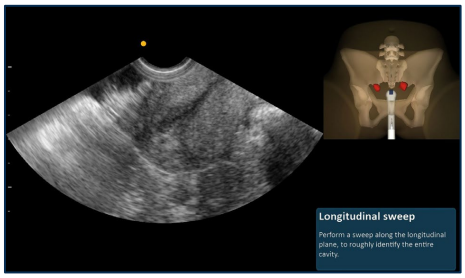

**Patient 2 “Dakota”**

- Pregnancy classification: Early pregnancy loss (based on history only)
- Number of embryos: 0
- Actual gestational age: approx. 7w, 3d
- EGA based on LMP: 8w, 4d
- Notes: Spontaneous abortion, mean sac diameter approx. 7w 3d, minimal growth since last ultrasound.
- Landmarks not possible to visualize: Embryo/fetus not present. No cardiac activity is present.
- Previous pregnancies: 2 Gravida, 1 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: Yes, scanned 2 weeks ago at 6w, 6d
- Recent medical history: Irregular cycle from 24-42 days, patient has experienced bleeding since last ultrasound



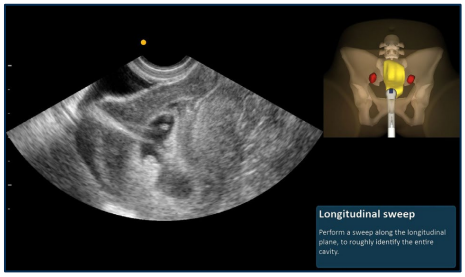

**Patient 3 “Riley”**

- Pregnancy classification: Definite intrauterine pregnancy
- Number of embryos: 1
- Actual gestational age: 12w, 1d
- EGA based on LMP: 11w, 5d
- Landmarks not possible to visualize: Yolk sac is not present.
- Previous pregnancies: 2 Gravida, 1 Para, 1 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: N/A



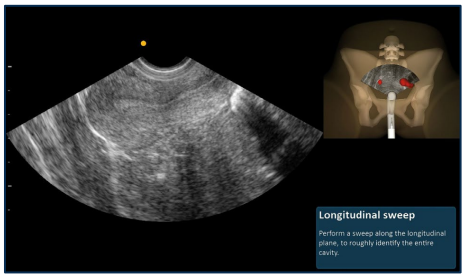

**Patient 4 “Imani”**

- Pregnancy classification: Pregnancy of unknown location
- Number of embryos: 0
- Actual gestational age: Unknown
- EGA based on LMP: Unknown
- Notes: Signs of ectopic pregnancy, fluid in the cul-de-sac, echolucent/sonolucent fluid or blood in the uterus
- Landmarks not possible to visualize: Gestational sac, embryo/fetus, yolk sac, and cardiac activity not present
- Previous pregnancies: 1 Gravida, 0 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: Positive pregnancy test



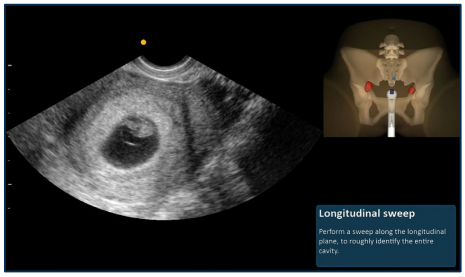

**Patient 5 “Chante”**

- Pregnancy classification: Early pregnancy loss
- Number of embryos: 1
- Actual gestational age: 6w, 6d
- EGA based on LMP: 6w, 6d
- Landmarks not possible to visualize: All are possible to visualize.
- Previous pregnancies: 1 Gravida, 0 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: N/A



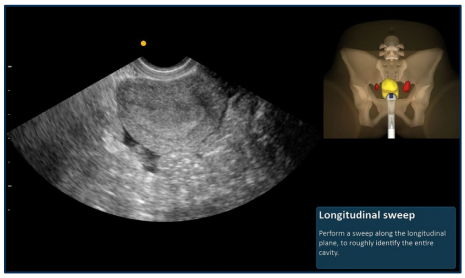

**Patient 6 “Noel”**

- Pregnancy classification: Pregnancy of unknown location
- Number of embryos: 0
- Actual gestational age: Unknown
- EGA based on LMP: 5w, 5d
- Notes: Pregnancy of unknown location. Patient could not be pregnant despite positive pregnancy test.
- Landmarks not possible to visualize: Gestational sac, embryo/fetus, yolk sac, and cardiac activity not present.
- Previous pregnancies: 1 Gravida, 0 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: History of irregular menses, weekly positive pregnancy test



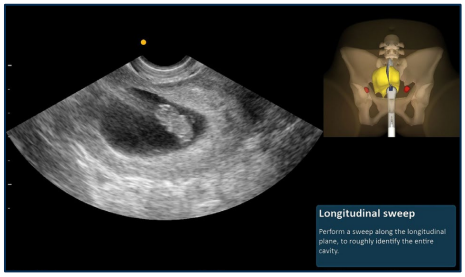

**Patient 7 “Galia”**

- Pregnancy classification: Definite intrauterine pregnancy
- Number of embryos: 1
- Actual gestational age: 8w, 1d
- EGA based on LMP: 8w, 1d
- Landmarks not possible to visualize: All are possible to visualize.
- Previous pregnancies: 1Gravida, 0 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: N/A



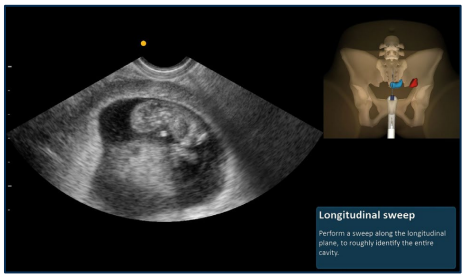

**Patient 8 “Kiana”**

- Pregnancy classification: Pregnancy of unknown location
- Number of embryos: 0
- Actual gestational age: Unknown
- EGA based on LMP: Unknown
- Notes: Pregnancy of unknown location with a mass in the left adnexa indicating a possible ectopic pregnancy.
- Landmarks not possible to visualize: Gestational sac, embryo/fetus, yolk sac, and cardiac activity not present.
- Previous pregnancies: 1 Gravida, 0 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: Positive pregnancy test




**Patient 9 “Jasmine”**

- Pregnancy classification: Definite intrauterine pregnancy
- Number of embryos: 1
- Actual gestational age: 9w, 1d
- EGA based on LMP: 9w, 1d
- Landmarks not possible to visualize: All are possible to visualize.
- Previous pregnancies: 1 Gravida, 0 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: Nabothian cysts on cervix

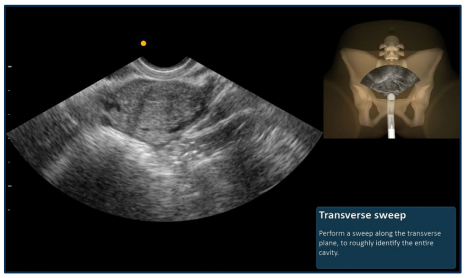



**Patient 10 “Sasha”**

- Pregnancy classification: Definite intrauterine pregnancy
- Number of embryos: 1
- Actual gestational age: 10w
- EGA based on LMP: 13w, 2d
- Landmarks not possible to visualize: All are possible to visualize.
- Previous pregnancies: 3 Gravida, 1 Para, 1 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: N/A


**Patient 11 “Marina”**

- Pregnancy classification: Ectopic
- Number of embryos: Multiple
- Actual gestational age: 8w 4d
- EGA based on LMP: 7w, 4d
- Notes: Visible ectopic twins. One embryo has a visible crown-rump length (CRL), which is measurable at 8w, 4d. The other embryo is not easily visualized. Gestational sac cannot be measured correctly.
- Landmarks not possible to visualize: All are possible to visualize.
- Previous pregnancies: 1 Gravida, 0 Para, 0 c-section, 0 ectopic




**Patient 12 “Odalis”**

- Pregnancy classification: Pregnancy of unknown location
- Number of embryos: 0
- Actual gestational age: Unknown
- EGA based on LMP: Unknown
- Notes: Pregnancy of unknown location with a mass in the left adnexa indicating a possible ectopic pregnancy.
- Landmarks not possible to visualize: Gestational sac, embryo/fetus, yolk sac, and cardiac activity not present.
- Previous pregnancies: 1 Gravida, 0 Para, 0 c-section, 0 ectopic
- Previous ultrasound for current pregnancy: None
- Recent medical history: Positive pregnancy test

**Patient 13 “Mei”**

- Pregnancy classification: Possible ectopic
- Number of Embryos: 0
- Gestational age and/or related notes: 7 weeks 4 days
- Landmarks not possible to visualize: none
- EGA based on LMP: 7 weeks 4 days
- Previous Pregnancies: None
- Previous ultrasound for current pregnancy: none
- Recent Medical history: intermittent light bleeding and cramping x 2 weeks

**Patient 14 “Toni”**

- Pregnancy classification: IUP
- Number of Embryos: 1
- Gestational age and/or related notes: 9 weeks 2 days
- Landmarks not possible to visualize: bicornuate is only seen in transverse plane
- EGA based on LMP: 9 weeks 6 days
- Previous Pregnancies: none
- Previous ultrasound for current pregnancy: no
- Recent Medical history: none

**Patient 15 “Katy”**

- Pregnancy classification: IUP/Possible Molar Pregnancy
- Number of Embryos: 1
- Gestational age and/or related notes: 7 weeks 3 days
- Landmarks not possible to visualize: clear endometrium (stripe), no cardiac
- EGA based on LMP: 8 weeks 5 days
- Previous Pregnancies: 3
- Previous ultrasound for current pregnancy: none
- Recent Medical history: severe N/V, and spotting

**Patient 16 “Vanessa”**

- Pregnancy classification: IUP
- Number of Embryos: 0
- Gestational age and/or related notes: 5week 3 days
- Landmarks not possible to visualize: none
- EGA based on LMP: 5 weeks
- Previous Pregnancies: 3
- Previous ultrasound for current pregnancy: no
- Recent Medical history: none

# Transvaginal Ultrasound Courses

### Name: Basic Skills in Transvaginal Ultrasound

- Description: Gain more insight into probe manipulation, pregnancy identification and fetal biometry under thirteen weeks.
- Objective: Familiarize yourself with probe handling, navigating the uterine cavity in both sagittal and transverse planes, identification of early embryonic structures and train how to take first trimester biometry measurements.
- Practice Section:
    - Case 1: Jasmine, Guided, (healthy, all landmarks visible, 9w 1d)
    - Case 2: Galia, Guided, (healthy, all landmarks visible, 8w, 1d)
    - Case 3: Akira, Guided, (healthy, all landmarks visible 7w, 1d)
    - Case 4: Sasha, Unguided, (healthy, all landmarks visible, 10w)
    - Case 5: Dakota, Guided, (early pregnancy loss, no cardiac activity, 7w, 3 d)
    - Case 6: Riley, Guided, (healthy, yoke sack not present, 12 w, 1d)
    - Case 7: Akira, Guided, (healthy, all landmarks visible, 7w, 1d)
    - Case 8: Noel, Unguided (unknown location, no landmarks, age unknown)
- Exam Section: All unguided
    - Sasha, (healthy, all landmarks are visible, 10w)
    - Odalis, (unknown, possible ectopic, unknown)
    - Jasmine (healthy, all landmarks visible, 9w, 1d)
    - Dakota (early pregnancy loss, not all present, 7w, 3d)

### Name: Transvaginal Ultrasound Skills Training

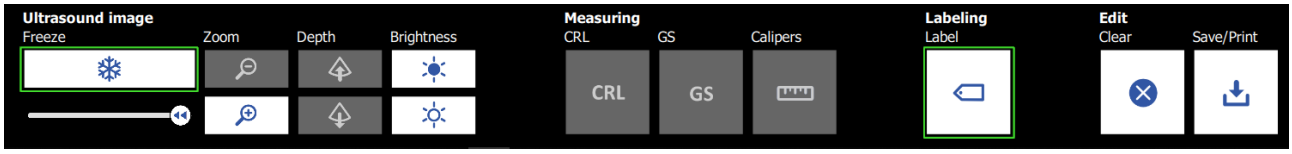
- Description: Further develop skills in transvaginal ultrasound by scanning the uterine cavity in a systematic way, determining pregnancy, fetal age and any possible pathology.
- Objective: Navigate the uterine cavity in a systematic way, determine the pregnancy and status thereof, take fetal biometry when necessary, fill out the proper diagnostic form.
- Practice Section:
    - Galia, Guided (healthy, all landmarks visible 8w, 1d)
    - Jasmine, Guided, (healthy, all landmarks visible, 9w, 1d)
    - Katy, Guided, (molar, unhealthy, 7w, 3d)
    - Vanessa, Guided, (healthy, all landmarks visible 5w, 3d)
    - Kiana, Unguided, (unknown, unknown, unknown)
    - Marina, Unguided, (Ectopic, multiple, 8w, 4d)
    - Odalis, Unguided, (unknown, unknown, unknown)
- Exam Section: All unguided
    - Mei (possible ectopic, all landmarks visible, 7w 4d)
    - Riley (healthy, all landmarks visible, 12w 1d)
    - Imani (unknown, unknown, unknown)
    - Toni (healthy, bicornuate, 9w 2d)

# Using the ultrasound module

## Step 1

### Run a simulation: Transvaginal Ultrasound

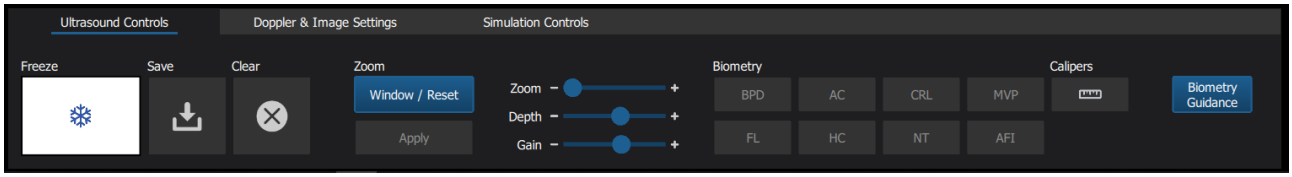
1. When selecting a case, you have the choice between variable levels of guidance:
    - Training mode (guidance on by default, you need to click **Next** to move to the next step)
    - Testing mode (guidance not available)
2. Navigate to the task panel on the right and follow the steps.
3. Use the control panel at the bottom of the screen to adjust or freeze the ultrasound image, take measurments, add lables, and save or clear the image.



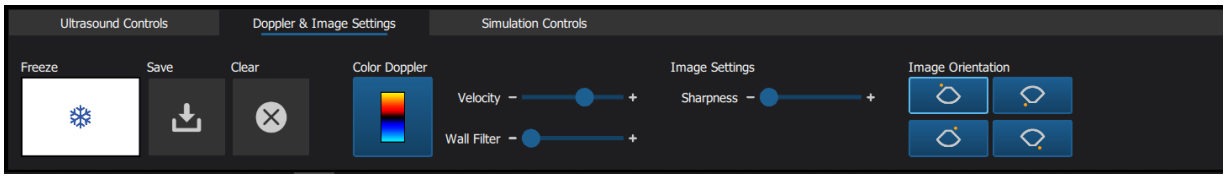

## Step 2

### Run a simulation: Transabdominal Ultrasound

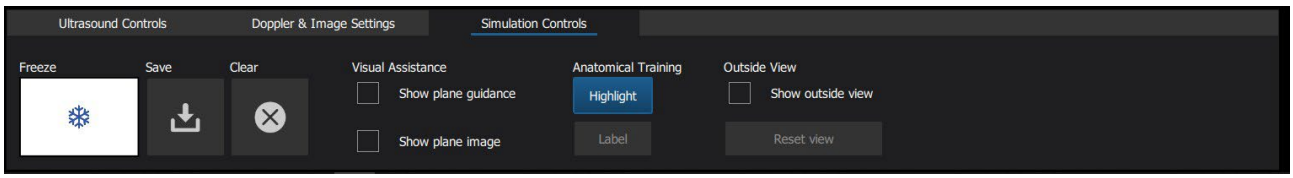
1. When selecting a case, you have the choice between variable levels of guidance:
    - Teaching mode (guidance on by default, you need to click **Continue** to move to the next step)
    - Practice mode (guidance can be turned on and off)
    - Testing mode (guidance not available)
    - Free roaming mode (no pre-defined procedure steps)
2. Navigate to the task panel on the right and follow the steps.
3. Use the control panel at the bottom of the screen to access ultrasound controls, doppler, and simulation controls.
4. **Ultrasound Controls** allow you to adjust or freeze an ultrasound image, take measurments, add lables, and save or clear an image.




5. **Doppler** allows you to place a window to see color doppler.




6. **Simulation Controls** allow you to skip a step or to go back, to turn visual assistance on and off, and to adjust image orientation.




## Step 3

### Place elliptical measurements

- Navigate to the desired view of the structure you want to measure
- Turn on highlight of the ideal calipers by pushing the procedure step (optional)
- Press freeze when you have the desired view
- Press the HC or AC button in transabdominal ultrasound / CRL or GS in transvaginal ultrasound
- Click on the screen in the desired location to begin the caliper placement
- Drag the mouse to second caliper end location and click on the desired location to place the caliper.
- Move mouse perpendicularly to expand and contract the caliper. Click the screen when the desired circumference is achieved. The circle will turn green when placed.
- To adjust an ellipse, click on any part of the oval to drag and drop to a new location. Double click to set the caliper.
- Press save to save the image for assessment in the image selection panel.

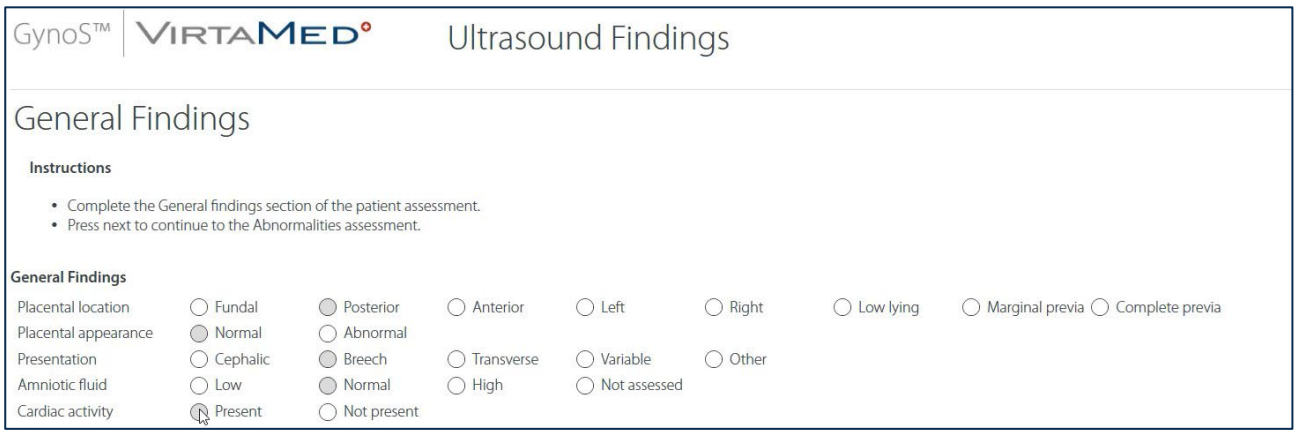
## Step 4

### Screenshot selection

1. Transvaginal Ultrasound
    - Ater you finish a procedure, you will need to choose the ultrasound image and measurement you would like to select for assessment. To select an image click **Save** and then **Check**.
2. Transabdominal Ultrasound
    - After you finish a procedure, delete the images that you do not wish to have assessed. The rest will be averaged.

## Step 5

### Ultrasound findings screen




1. The Ultrasound Findings screen contains a series of questions that you will need to answer in order to demonstrate that you have performed and completed the examination and understood the results.
2. The screen contains a series of multiple-choice questions. Select the correct answer for each question.
3. Once you have completed your selection, click on the Check Your Answers button to have your answers automatically assessed.
4. The corrected results will appear, with **green** check marks indicating a correct answer and **red** 'X' marks indicating incorrect answers.

# Ovum Pick-Up (OPU)

## Module description

The Ovum Pick-up (OPU) module includes various scenarios to train fertility specialists on the oocyte retrieval procedure. It is designed to train individuals and teams on effective collaboration to perform the procedure confidently, efficiently and safely. The trainee acquires basic and advanced skills by completing exercise cases of varying difficulties and clinical presentation. The trainee also learns to avoid critical neighbouring anatomical structures to prevent potential trauma and complications.

The module offers training on commercially available oocyte aspiration needles of different gauges and types. Currently, needles from Cook Medical are integrated into the simulator, in particular,

- 17g single lumen
- 17g double lumen
- 19g single lumen

## Learning objectives

- Learn how to identify and locate key anatomical structures
- Practice how to safely puncture and efficiently aspirate the follicular fluid and oocytes
- Develop the motor and coordination skills required to perform the procedure with a team

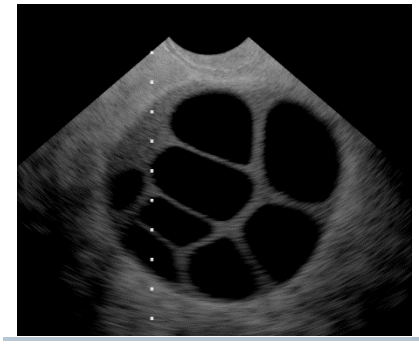
## Training cases

Controlled Ovarian Stimulation (COS)

- Patient with a reasonable number of follicles per ovary.

Poor Ovarian Responder (POR)

- Patient with a poor response to the hormonal treatment presenting only very few follicles. Extra care is needed to aspirate the very few available oocytes.



Ovarian Hyperstimulation Syndrome (OHSS)

- Patient with a very high number of follicles and very large ovaries. In this exercise, accessing all follicles while keeping the procedure time short to avoid trauma and blood clots is a challenge.

High Ovarian Responder (HOR)

- Patient with an increased response and a high number of smaller follicles per ovary.

Ovarian Endometriosis (OMA)

- Patient with three ovarian endometrial cysts. Accessing all follicles while avoiding puncturing the cyst and contaminating the sample is a challenge.