Surgical Curriculum for Residents in Obstetrics and Gynecology
## CONTENTS

Preface v

<table>
<thead>
<tr>
<th>SURGICAL EXERCISE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Sterile Technique: Scrubbing and Gowning for Surgery and Preparing and Draping the Patient 1</td>
</tr>
<tr>
<td>2 Universal Precautions 9</td>
</tr>
<tr>
<td>3 Knot Tying 13</td>
</tr>
<tr>
<td>4 Selection of Suture Material 15</td>
</tr>
<tr>
<td>5 Selection of Surgical Instruments 18</td>
</tr>
<tr>
<td>6 The Principal Incisions for Pelvic Surgery 34</td>
</tr>
<tr>
<td>7 Closing an Abdominal Incision 38</td>
</tr>
<tr>
<td>8 Repair of a Midline Episiotomy 40</td>
</tr>
<tr>
<td>9 Isolation and Ligation of Blood Vessels 43</td>
</tr>
<tr>
<td>10 Ligation of a Tissue Pedicle 45</td>
</tr>
<tr>
<td>11 Ultrasound-Guided Amniocentesis 46</td>
</tr>
<tr>
<td>12 Principles of Electrosurgery 47</td>
</tr>
<tr>
<td>13 Loop Electrosurgical Excision Procedure (LEEP) 49</td>
</tr>
<tr>
<td>14 Principles of Laser Surgery 51</td>
</tr>
</tbody>
</table>
PREFACE

This manual is designed to be an introductory curriculum for teaching basic surgical skills to first-year residents in obstetrics and gynecology. The surgical exercises are simple, inexpensive models that use readily available materials. Each exercise includes specific performance-based learning objectives, clear instructions for preparing the model, and a checklist of essential skills. All exercises are adapted to small groups of up to four students and can be completed within 60 minutes. The members of the Council on Resident Education in Obstetrics and Gynecology Education Committee hope you will find these exercises to be of practical value in teaching basic surgical principles to residents early in the course of their training.

PATRICK DUFF, MD
Committee Chair and Editor
SURGICAL EXERCISE

Sterile Technique: Scrubbing and Gowning for Surgery and Preparing and Draping the Patient

DAVID SCHWARTZ, MD

FORMAT: Live model

LEARNING OBJECTIVES:
1. Scrub properly for surgery
2. Gown and glove properly for surgery without breaking sterile technique
3. Drape the supine patient correctly for abdominal surgery

MATERIALS REQUIRED:
• Scrub sink
• Scrub soap
• Surgical caps
• Surgical masks
• Surgical gloves
• Surgical gowns
• Surgical nurse
• Mannequin or volunteer to serve as simulated patient for draping exercise

NUMBER OF STUDENTS PER SESSION: 4
APPROXIMATE TIME FOR THE EXERCISE: 40 minutes

Exercise 1-1 Scrubbing for surgery

The instructor first should demonstrate the correct way to don the surgical cap and mask. Next, the instructor should demonstrate the proper way to open the packet of surgical scrub soap, turn on the water, and adjust the water temperature. The instructor then should demonstrate the technique for cleaning beneath the nails and scrubbing the hands and forearms (Figs. 1.1–1.4). The total scrub time should be 5 minutes. Finally, the instructor should demonstrate the correct technique for keeping hands and forearms elevated and then entering the operating room (Fig. 1.5). After viewing this demonstration, the student should repeat the exercise.
Checklist of essential skills

- The student correctly dons the surgical cap and mask.
- The student opens the packet of surgical scrub soap correctly.
- The student turns on the water correctly and adjusts the temperature to a comfortable level.
- The student cleans beneath his or her nails correctly.
- The student scrubs hands and forearms correctly.
- The student keeps hands and forearms elevated and avoids contamination while entering the door to the operating room.

Exercise 1-2  Gowning for surgery

The instructor should demonstrate the proper way to accept the drying towel from the surgical nurse, to dry hands and forearms (Fig. 1.6), and to dispose of the used towel. The instructor then should demonstrate the correct way to accept and don the sterile gown from the surgical nurse (Fig. 1.7). Finally, the instructor should demonstrate the proper way to don gloves (Figs. 1.8 and 1.9). The double gloving technique should be emphasized as a mechanism to prevent sharp injuries and body fluid exposure. Once gowned and gloved, the instructor should demonstrate the proper technique for turning to close off the back of the gown (Fig. 1.10). The student then should repeat the exercise.

Checklist of essential skills

- The student accepts the drying towel properly without contaminating it against his or her body.
- The student dries hands properly using a separate sterile area of the towel for each hand.
- The student disposes of the used towel properly.
- The student receives the surgical gown properly.
- The student dons gloves without contaminating gown or gloves.
- The student turns properly to close off the back of the gown.

Exercise 1-3  Preparing and draping the patient

The simulated patient or mannequin should be placed in the supine position on the operating room table. With the students gowned and gloved, the instructor should describe the antiseptic solutions that are acceptable for preparation of the surgical field and then demonstrate the proper way to prepare the operative field for surgery. The instructor then should describe the proper technique for placing the surgical drapes on the patient’s abdomen. (This technique may differ from institution to institution and will vary, depending on use of paper or cloth drapes.) The students then should drape the surgical field (Fig. 1.11).

Checklist of essential skills

- The student describes the proper solutions for preparation of the surgical field.
- The student describes the proper method for scrubbing the surgical field.
- The student properly positions the surgical drapes.
Fig. 1.1. Opening the scrub soap.

Fig. 1.2. Cleaning (A) beneath the nails and (B) the fingertips.
Fig. 1.3. Proper technique for scrubbing hands.

Fig. 1.4. Scrubbing forearms.
Fig. 1.5. Entering the operating room.

Fig. 1.6. (A) Receiving the scrub towel. (B) Drying hands.
Fig. 1.7. Receiving surgical gown.

Fig. 1.8. Donning first set of gloves.

Fig. 1.9. Donning second set of gloves.
Fig. 1.10. Closing the gown. (A) Tying the closure. (B) Turning.
Fig. 1.11. Draping the patient. Placing, opening, and spreading the drape (A–C). Preparing the surgical field (D–E).

Note: For a more comprehensive description of sterile technique, please consult Fortunato N. Operating room technique. 9th ed. St. Louis: Mosby, 2000.
SURGICAL EXERCISE 2

Universal Precautions
WILLIAM GIBBONS, MD

FORMAT: Bench model—demonstration

LEARNING OBJECTIVES:
1. Describe the major sources of occupational injury among health care workers
2. Describe the principal precautions that should be observed to prevent occupational exposure to infected body fluids
3. Describe the protective clothing, materials, and equipment available to health care workers
4. Describe the appropriate immunoprophylaxis for hepatitis B infection
5. Describe the appropriate chemoprophylaxis for occupational exposure to HIV infection

MATERIALS REQUIRED:
• Surgical gloves—underglove and overglove
• Surgical mask—with and without face shield
• Surgical safety goggles
• Surgical cap
• Shoe covers
• Surgical gown
• Surgical drape
• Safety syringe–needle set
• Sharps container
• Hollow needle for blood draw
• Surgical needles: tapered (atraumatic), cutting, and blunt

NUMBER OF STUDENTS PER MODEL: 6–8
APPROXIMATE TIME FOR THE EXERCISE: 30 minutes

Exercise Describing potential injuries and precautions
The instructor should describe the major sources of occupational injury among health care workers, eg, “splash injuries”; injuries from hollow and surgical needles; and injuries due to other sharp objects such as scalpels, surgical instruments, or bone fragments. The instructor should describe the appropriate precautions for obtaining and handling body fluids from potentially infected patients. The instructor
then should demonstrate use of protective clothing and equipment such as masks with face shields, double gloves, water-repellent surgical gowns and drapes, safety syringe–needle set, and blunt surgical needles (Figs. 2.1–2.6). Finally, the instructor should describe the appropriate immunoprophylaxis for hepatitis B and chemoprophylaxis for occupational exposure to human immunodeficiency virus (HIV) infection.

Checklist of essential skills

☐ The student describes the major causes of occupational injury among health care workers.

☐ The student describes the principal precautions for prevention of occupational exposure to infected body fluids.

☐ The student describes the principal safety equipment available for prevention of occupational injury.

☐ The student describes the indications for hepatitis B vaccine and hepatitis B immune globulin.

☐ The student describes the indications for chemoprophylaxis for HIV exposure in the workplace.

☐ The student lists the drugs and duration of treatment for chemoprophylaxis against HIV infection.

■ Fig. 2.1. Face shields.
Fig. 2.2. Underglove (top) and overglove (bottom).

Fig. 2.3. Water-repellent hair covers.

Fig. 2.4. Water-repellent shoe covers.
Fig. 2.5. Water-repellent gowns.

Fig. 2.6. Safety syringe–needle set.
SURGICAL EXERCISE 3

Knot Tying
DIANE HARTMANN, MD

FORMAT: Bench model

LEARNING OBJECTIVES:
1. Tie a two-handed square knot
2. Tie a two-handed surgeon’s knot
3. Tie a one-handed square knot
4. Tie a one-handed surgeon’s knot
5. Tie a square knot and surgeon’s knot using an instrument tie
6. Tie a square knot in a deep space

MATERIALS REQUIRED:
• Worktable
• Knot tying kit and practice board
• Blue surgical towel
• Suture
• Needle driver
• Tissue forceps—pick-ups with teeth, Russian forceps, or Bonney forceps

NUMBER OF STUDENTS PER TYING BOARD: 1 or 2
APPROXIMATE TIME FOR THE EXERCISE: 45–60 minutes

Exercise 3-1

Tying a two-handed square knot and two-handed surgeon’s knot

The instructor should demonstrate the skill using a large-diameter material such as a cord or round shoelace. One half of the cord should be colored and the other half white so that the student easily can visualize the structure of a square knot. The student then should practice the two types of ties.

Checklist of essential skills
☐ The student’s hands are positioned properly for the first tie so that they do not have to be crossed to secure a square tie.
☐ The student maintains tension on the first knot while placing the second knot but avoids excessive upward traction.
☐ The second knot is applied squarely and securely.
Exercise 3-2  **Tying a one-handed square knot and a surgeon’s knot**

The instructor should demonstrate the skill using a large-diameter material such as cord or round shoelace. One half of the cord should be colored and the other half white so that the student easily can visualize the structure of a square knot. The student then should practice the two types of ties.

**Checklist of essential skills**

☐ The student’s hands are positioned properly for the first tie so that they do not have to be crossed to secure a square tie.

☐ The second knot is applied squarely and securely.

☐ The student maintains tension on the first knot while placing the second knot but avoids excessive upward traction.

Exercise 3-3  **Tying a square knot and surgeon’s knot using an instrument tie**

The instructor should demonstrate the skills using a 0-gauge suture attached to a tapered needle. A blue surgical towel can be folded lengthwise to simulate the margins of an incision. The student then should practice the two types of ties.

**Checklist of essential skills**

☐ The student mounts the needle in the correct position in the needle driver.

☐ The student holds the needle driver using a tripod grip.

☐ The student holds the tissue forceps correctly.

☐ The student correctly positions the margins of the incision using the tissue forceps.

☐ The student ties a secure surgeon’s knot and a secure square knot.

Exercise 3-4  **Tying a secure square knot in a deep space**

The instructor should demonstrate the skill using a 0-gauge suture and the aforementioned practice board. A passer may be used to place the suture around the simulated deep pedicle. The student then should practice the skill.

**Checklist of essential skills**

☐ The student manipulates the passer correctly.

☐ The knots are placed squarely.

☐ The student avoids excessive upward traction on the pedicle.
SURGICAL EXERCISE 4

Selection of Suture Material
DIANE HARTMANN, MD

FORMAT: Bench model

LEARNING OBJECTIVES:
1. Identify and characterize resorbable and permanent sutures and describe the advantages and disadvantages of each
2. Describe the relative tensile strength of various sutures
3. Describe the numbering of suture material based on diameter of the fiber
4. Describe the optimal suture material for selected clinical situations

MATERIALS REQUIRED:
• Worktable
• Packages of the following suture materials, opened to expose the individual suture:
  0 Plain gut
  0 Chromic
  0 Dexon, Vicryl, or Polysorb
  0 Maxon or PDS
  0 Silk
  0 Nylon or polypropylene
  2-0, 3-0, 4-0, 5-0 Dexon, Vicryl, or Polysorb

NUMBER OF STUDENTS PER MODEL: 2–4

APPROXIMATE TIME FOR THE EXERCISE: 30–45 minutes

Exercise 4-1 Differentiation between resorbable and permanent sutures and between multifilament and monofilament sutures

The students first should separate the sutures into two basic categories—resorbable and permanent. They then should separate them into multifilamented and monofilamented sutures.

Checklist of essential skills
☐ The following sutures are identified as resorbable: plain, chromic, Dexon, Vicryl, Polysorb, Maxon, and PDS.
☐ The following sutures are identified as permanent: silk, nylon, and polypropylene.
The following sutures are identified as multifilamented: plain gut, chromic, Dexon, Vicryl, Polysorb, and silk.

The following sutures are identified as monofilamented: Maxon, PDS, nylon, and polypropylene.

Exercise 4-2  **Identifying principal advantages and disadvantages of resorbable and permanent sutures**

The instructor should lead an interactive discussion of the relative advantages and disadvantages of resorbable and permanent sutures.

**Checklist of essential skills**

The student identifies the following advantages and disadvantages of resorbable and permanent sutures:

<table>
<thead>
<tr>
<th>Type of Suture</th>
<th>Advantages</th>
<th>Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resorbable</td>
<td>Less likely to be a nidus for inflammation and infection</td>
<td>Decreased tensile strength</td>
</tr>
<tr>
<td>Permanent</td>
<td>Greater tensile strength</td>
<td>Possible nidus for inflammation, infection, fistula, or sinus tract formation</td>
</tr>
</tbody>
</table>

Exercise 4-3  **Identifying the relative tensile strength of sutures**

The student(s) should arrange all 0-gauge sutures in ascending order of strength.

**Checklist of essential skills**

The student arranges the sutures in the following order:

Plain gut
Chromic
Dexon, Vicryl, and Polysorb
Maxon and PDS
Silk, nylon, and polypropylene

Exercise 4-4  **Identifying relative diameter of individual sutures**

The student(s) should arrange all of the Dexon (or Vicryl or Polysorb) sutures in ascending order of size (diameter).

**Checklist of essential skills**

The student arranges the sutures in the following order:

5-0
4-0
3-0
2-0
0
Exercise 4-5  Selecting sutures for specific clinical situations

The student(s) should be presented with several clinical scenarios (see table) and asked to describe the optimal suture for each situation.

Checklist of essential skills

Each student completes a tabular summary similar to the one presented below.

<table>
<thead>
<tr>
<th>Clinical Scenario</th>
<th>Suture</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tubal interruption or ligation</td>
<td>Plain gut (0 gauge)</td>
<td>Suture should provide temporary hemostasis but be rapidly resorbed to prevent chronic inflammation and possible fistula formation.</td>
</tr>
<tr>
<td>Repair of episiotomy or vaginal or perineal laceration</td>
<td>Chromic, Dexon, Vicryl, or Polysorb (2-0 or 3-0 gauge)</td>
<td>These sutures, particularly the latter three, have improved tensile strength compared to plain gut. They also are less inflammatory and may reduce postpartum discomfort. Permanent sutures never should be used because of possible chronic inflammatory reaction leading to dyspareunia.</td>
</tr>
<tr>
<td>Closure of fascia in a patient at low risk for wound disruption</td>
<td>Dexon, Vicryl, or Polysorb (0 gauge)</td>
<td>These sutures are more inert than plain gut or chromic, and they have improved tensile strength.</td>
</tr>
<tr>
<td>Closure of fascia in a patient at exceptionally high risk for wound infection and disruption (eg, morbid obesity, type 1 diabetes, steroid use, preexisting infection such as pelvic inflammatory disease, tubo-ovarian access, chorioamnionitis)</td>
<td>Maxon, PDS, nylon, or polypropylene (0 gauge)</td>
<td>Monofilamented sutures are more inert and have greater tensile strength than multifilamented sutures. Maxon and PDS are monofilamented delayed resorbable sutures. Patients at exceptionally high risk for wound infection or disruption may require permanent sutures. Silk suture never should be used in tissue when the risk of infection is high because this suture is so inflammatory.</td>
</tr>
</tbody>
</table>
SURGICAL EXERCISE 5

Selection of Surgical Instruments

PATRICK DUFF, MD

FORMAT: Bench model—demonstration

LEARNING OBJECTIVES:

1. List the names of the surgical instruments most commonly used in obstetric and gynecologic procedures
2. Describe the proper technique for manipulating each instrument
3. Describe the principal uses for the surgical instruments

MATERIALS REQUIRED:

• Worktable
• Instrument tray for cesarean delivery and hysterectomy
• Photographs (“flash cards”) of surgical instruments (see list at end of this exercise)

NUMBER OF STUDENTS: 2-4

APPROXIMATE TIME FOR THE EXERCISE: 30 minutes

Exercise Naming and using surgical instruments

The instructor should identify each instrument and describe its principal use. The instructor then should demonstrate the proper way to hold and manipulate each instrument. Particular attention should be devoted to loading the surgical needle onto the needle driver and then correctly positioning the needle driver for placement of sutures (Figs. 5.1 and 5.2). Subsequently, the students should have the opportunity to hold and manipulate the instruments. Thereafter, the instructor should use the flash cards to be certain that the students know the names of the instruments and can describe their principal use.

Checklist of essential skills

☐ The student identifies each instrument and describes its principal application.
☐ The student demonstrates the proper way to hold and manipulate each instrument.
☐ The student applies the surgical needle correctly in the needle driver.
<table>
<thead>
<tr>
<th>Surgical Instrument</th>
<th>Principal Use in Obstetrics and Gynecology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retractors</td>
<td></td>
</tr>
<tr>
<td>Army–Navy (Fig. 5.3)</td>
<td>Retract skin in a thin patient</td>
</tr>
<tr>
<td>Balfour (Fig. 5.4)</td>
<td>Self-retaining retractor used for extended gynecology procedures</td>
</tr>
<tr>
<td>Bladder blade (Fig. 5.5)</td>
<td>Retract bladder away from lower uterine segment</td>
</tr>
<tr>
<td>Deaver (Fig. 5.6)</td>
<td>Retract body wall and internal structures, especially when operating deep in the pelvis</td>
</tr>
<tr>
<td>Malleable (ribbon) (Fig. 5.7)</td>
<td>Retract bowel</td>
</tr>
<tr>
<td>O’Connor–O’Sullivan (Fig. 5.8)</td>
<td>Self-retaining retractor used for extended gynecology procedures</td>
</tr>
<tr>
<td>Richardson (Fig. 5.9)</td>
<td>Retract skin in a heavier patient</td>
</tr>
<tr>
<td>Right angle (vaginal wall) (Fig. 5.10)</td>
<td>Retract vaginal wall during repair of a laceration or placement of a cerclage</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Retractors</td>
<td></td>
</tr>
<tr>
<td>Army–Navy (Fig. 5.3)</td>
<td>Grasp fascia</td>
</tr>
<tr>
<td>Balfour (Fig. 5.4)</td>
<td>Grasp fallopian tube, ureter, large vessel</td>
</tr>
<tr>
<td>Bladder blade (Fig. 5.5)</td>
<td>Secure a vascular pedicle</td>
</tr>
<tr>
<td>Deaver (Fig. 5.6)</td>
<td>Secure a small tissue pedicle</td>
</tr>
<tr>
<td>Malleable (ribbon) (Fig. 5.7)</td>
<td>Clamp soft tissue pedicles when performing a hysterectomy</td>
</tr>
<tr>
<td>O’Connor–O’Sullivan (Fig. 5.8)</td>
<td>Secure a small blood vessel</td>
</tr>
<tr>
<td>Richardson (Fig. 5.9)</td>
<td>Secure a small tissue pedicle</td>
</tr>
<tr>
<td>Right angle (vaginal wall) (Fig. 5.10)</td>
<td>Grasp the skin edges while closing a surgical incision</td>
</tr>
<tr>
<td></td>
<td>Grasp firm tissue</td>
</tr>
<tr>
<td></td>
<td>Grasp fine tissue and small blood vessels</td>
</tr>
<tr>
<td></td>
<td>Grasp firm tissue</td>
</tr>
<tr>
<td></td>
<td>Grasp the uterine wall while closing a hysterotomy incision</td>
</tr>
<tr>
<td></td>
<td>Grasp fine tissue</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Tissue forceps</td>
<td></td>
</tr>
<tr>
<td>Adson (Fig. 5.29)</td>
<td>Grasp the skin edges while closing a surgical incision</td>
</tr>
<tr>
<td>Bonney (Fig. 5.30)</td>
<td>Grasp firm tissue</td>
</tr>
<tr>
<td>DeBakey (Fig. 5.31)</td>
<td>Grasp fine tissue and small blood vessels</td>
</tr>
<tr>
<td>Pick-ups with teeth (Fig. 5.32)</td>
<td>Grasp firm tissue</td>
</tr>
<tr>
<td>Russian (Fig. 5.33)</td>
<td>Grasp the uterine wall while closing a hysterotomy incision</td>
</tr>
<tr>
<td>Smooth (pick-ups without teeth) (Fig. 5.34)</td>
<td>Grasp fine tissue</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Scissors</td>
<td></td>
</tr>
<tr>
<td>Bandage (Fig. 5.35)</td>
<td>Cut bandages; make uterine incision</td>
</tr>
<tr>
<td>Jorgenson (Fig. 5.36)</td>
<td>Excise the cervix at the completion of a hysterectomy</td>
</tr>
<tr>
<td>Mayo (straight) (Fig. 5.37)</td>
<td>Cut suture</td>
</tr>
<tr>
<td>Mayo (curved) (Figs. 5.37 and 5.38)</td>
<td>Cut firm tissue such as fascia</td>
</tr>
<tr>
<td>Metzenbaum (Fig. 5.38)</td>
<td>Cut fine tissue such as peritoneum or loose areolar tissue</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Suction devices</td>
<td></td>
</tr>
<tr>
<td>Poole (Figs. 5.39 and 5.40)</td>
<td>Aspirate large fluid collections</td>
</tr>
<tr>
<td>Yankauer (Figs. 5.40 and 5.41)</td>
<td>Aspirate small fluid collections</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Uterine sound (Fig. 5.42)</td>
<td>Determine depth of uterine cavity</td>
</tr>
<tr>
<td>Cervical dilators (Fig. 5.43)</td>
<td>Dilate cervical canal before dilation and curettage or hysteroscopy</td>
</tr>
<tr>
<td>Curet (Fig. 5.44)</td>
<td>Curet the uterine cavity</td>
</tr>
</tbody>
</table>
Fig. 5.1. Incorrect applications of needle driver (A–C).

Fig. 5.2. Correct application of needle driver.
Fig. 5.3. Army–Navy retractor.

Fig. 5.4. Balfour self-retaining retractor.

Fig. 5.5. Bladder blade.
Fig. 5.6. Deaver retractor.

Fig. 5.7. Malleable retractor.

Fig. 5.8. O’Connor–O’Sullivan retractor.
Fig. 5.9. Large (top) and medium (bottom) Richardson retractors.

Fig. 5.10. Right-angle (vaginal wall) retractor.

Fig. 5.11. Allis clamp.
Fig. 5.12. Babcock clamp.

Fig. 5.13. Burlisher clamp.

Fig. 5.14. Carmalt clamp.
**Fig. 5.15.** Carmalt clamp (top); compare size with the hemostat/Crile clamp (bottom).

**Fig. 5.16.** Straight Heaney clamp.

**Fig. 5.17.** Curved Heaney clamp.
■ Fig. 5.18. Hemostat (Crile) clamp.

■ Fig. 5.19. Kelly clamp.

■ Fig. 5.20. Large Kelly (hysterectomy) clamp.
Fig. 5.21. Kocher clamp.

Fig. 5.22. Straight Masterson clamp.

Fig. 5.23. Curved Masterson clamp.
■ Fig. 5.24. Mexican clamp.

■ Fig. 5.25. Straight needle holder.

■ Fig. 5.26. Placental (ring) forceps.

■ Fig. 5.27. Right-angle clamp.
Fig. 5.28. Tenaculum (single tooth).

Fig. 5.29. Adson forceps.

Fig. 5.30. Bonney forceps.

Fig. 5.31. DeBakey forceps.
Fig. 5.32. Pick-ups with teeth (rat-tooth pick-ups).

Fig. 5.33. Russian forceps.

Fig. 5.34. Pick-ups without teeth (smooth pick-ups).

Fig. 5.35. Bandage scissors.
Fig. 5.36. Jorgenson scissors.

Fig. 5.37. Curved Mayo scissors (top); straight Mayo scissors (bottom).
Fig. 5.38. Metzenbaum scissors (top); curved Mayo scissors (bottom).

Fig. 5.39. Poole suction catheter.

Fig. 5.40. Comparison of Yankauer suction catheter (top) and Poole suction catheter (bottom).

Fig. 5.41. Yankauer suction catheter.
Fig. 5.42. Uterine sound.

Fig. 5.43. Cervical dilators.

Fig. 5.44. Uterine curet.
SURGICAL EXERCISE 6

The Principal Incisions for Pelvic Surgery
WILLIAM GIBBONS, MD

FORMAT: Bench model

LEARNING OBJECTIVES:
1. Describe the anatomic landmarks for a subumbilical midline incision
2. Describe the anatomic landmarks for a transverse (Pfannenstiel) incision
3. Describe the advantages and disadvantages of a subumbilical midline incision and a transverse incision
4. Identify the optimal incision for selected clinical situations

MATERIALS REQUIRED:
• Worktable
• Anatomic drawings (see Figs. 6.1 and 6.2)
• Transparency
• Erasable marking pens
• Eraser
• Flash cards

NUMBER OF STUDENTS PER MODEL: 1
APPROXIMATE TIME FOR THE EXERCISE: 30–45 minutes

Exercise 6-1 Identifying the correct location for a midline and transverse incision

Each student should be given an anatomic drawing of the lower torso (Fig. 6.1). The drawing should be covered with a transparency, and the student should label the following structures:
• Umbilicus
• Anterior superior iliac spines
• Pubic symphysis
• Inguinal ligaments

The student then should draw the correct locations for a subumbilical midline incision and a transverse (Pfannenstiel) incision.
Checklist of essential skills
1. The student correctly identifies the anatomic landmarks.
2. The student places incisions in the correct position on the anterior abdominal wall.

Exercise 6-2  Identifying the layers of the anterior abdominal wall

Each student should be given an anatomic drawing of a cross section of the anterior abdominal wall (Fig. 6.2). The drawing should be covered with a transparency, and the student should label the following structures:

- Skin
- Subcutaneous tissue
- Anterior sheath of the rectus abdominus muscle
- Posterior sheath of the rectus abdominus muscle
- Parietal peritoneum

Checklist of essential skills
1. The student correctly identifies the anatomic landmarks.

Exercise 6-3  Identifying the advantages and disadvantages of the midline and transverse incisions

The student is presented with the following table and asked to provide the missing information.

<table>
<thead>
<tr>
<th>Type of Incision</th>
<th>Principal Advantages</th>
<th>Principal Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subumbilical–midline</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transverse</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Checklist of essential skills
1. The student completes the table in the following manner:

<table>
<thead>
<tr>
<th>Type of Incision</th>
<th>Principal Advantages</th>
<th>Principal Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subumbilical–midline</td>
<td>Faster abdominal entry, enhanced exposure</td>
<td>Decreased strength, decreased cosmesis</td>
</tr>
<tr>
<td>Transverse</td>
<td>Greater strength, enhanced cosmesis</td>
<td>Slower abdominal entry, decreased exposure</td>
</tr>
</tbody>
</table>
Exercise 6-4  **Identifying the optimal incision for selected clinical situations**

The students should be presented with flash cards presenting the clinical scenarios outlined below. They then should identify the optimal surgical incision and justify their answer.

- A 25-year-old woman with hemorrhagic shock due to probable ruptured ectopic pregnancy
- A 28-year-old woman with probable dermoid cyst
- A 58-year-old woman with 8-cm complex left adnexal mass
- A 22-year-old woman at term with frank breech presentation
- A 35-year-old woman at term with arrest of descent at the midpelvis
- A 39-year-old woman with hemorrhagic shock due to abruptio placentae
- A 30-year-old woman at term with type 1 (insulin-dependent) diabetes and arrest of dilation at 6 cm
- A 37-year-old woman at term with suspected fetal macrosomia and transverse lie with back down

**Checklist of essential skills**

☐ The student selects the correct incision for each situation and explains their answers in the following manner:

<table>
<thead>
<tr>
<th>Clinical Situation</th>
<th>Optimal Incision</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ruptured ectopic</td>
<td>Midline</td>
<td>Priority is rapid abdominal entry and optimal exposure</td>
</tr>
<tr>
<td>Dermoid cyst</td>
<td>Transverse</td>
<td>Low probability of malignancy; priorities are strength and cosmesis</td>
</tr>
<tr>
<td>Complex adnexal mass</td>
<td>Midline</td>
<td>Priority is exposure</td>
</tr>
<tr>
<td>Frank breech</td>
<td>Transverse</td>
<td>No overriding need for rapid abdominal entry (if fetal heart rate is stable) or enhanced exposure (unless the fetus is macrosomic)</td>
</tr>
<tr>
<td>Arrest of descent</td>
<td>Transverse</td>
<td>No overriding need for rapid abdominal entry (if fetal heart rate is stable) or enhanced exposure (unless the fetus is macrosomic)</td>
</tr>
<tr>
<td>Abruptio placentae</td>
<td>Midline</td>
<td>Priority is rapid abdominal entry</td>
</tr>
<tr>
<td>Maternal diabetes with arrest of dilation</td>
<td>Transverse</td>
<td>Priority is strength of closure in a patient at increased risk for wound disruption/infection</td>
</tr>
<tr>
<td>Transverse lie with back down; macrosomia</td>
<td>Midline</td>
<td>Priority is enhanced exposure</td>
</tr>
</tbody>
</table>
Fig. 6.1. Anatomic drawing of lower torso.

Fig. 6.2. Anatomic drawing of cross section of anterior abdominal wall.
SURGICAL EXERCISE 7

Closing an Abdominal Incision

PATRICK DUFF, MD

FORMAT: Bench model (simulation of fascial closure) or placenta model

LEARNING OBJECTIVES:
Close an incision using the following techniques: simple interrupted sutures, continuous suture, and Smead-Jones suture

MATERIALS REQUIRED:
• Worktable
• Bath towel or blue or green “surgical towel”
• Pick-ups with teeth, Adson pick-ups, or Bonney pick-ups
• Straight needle driver
• Suture (0, 2-0, or 3-0 chromic, Dexon, Vicryl, or Polysorb)
• Straight Mayo scissors
  OR
• Formalin-fixed placenta
• Scalpel
• Gloves
• All instruments and sutures in previous list

NUMBER OF STUDENTS PER MODEL: 2
APPROXIMATE TIME FOR EACH EXERCISE: 20–30 minutes

Exercise 7-1 Closing a simulated fascial incision
The bath towel should be folded to create two parallel “ridges,” separated by approximately 2 cm, to simulate a fascial incision. The ridges then should be reapproximated (closed) using three different techniques: simple interrupted sutures, continuous suture, and Smead-Jones sutures.

OR

Exercise 7-2 Closing the incision of a model placenta
The student should make three incisions in the fetal side of the model placenta, each approximately 6 in. long. The first incision should be closed with simple interrupted sutures, the second with a continuous suture, and the third with Smead-Jones sutures.
Checklist of essential skills

☐ The student holds the needle driver correctly using a tripod grip.
☐ The student holds the tissue forceps correctly.
☐ For simple and continuous sutures, needle bites are placed at least 1 cm from the edge of the simulated incision.
☐ For the Smead-Jones suture, the “far” bites are placed approximately 1.5 cm from the edge of the incision, and the “near” bites are placed approximately 0.5 cm from the edge.
☐ The student uses the tissue forceps to steady the tissue and needle before removing the needle from the incision.
☐ The student removes the needle correctly from the tissue using the needle driver.
☐ The needle is reloaded correctly on the needle driver, using the pick-ups, not the operator’s fingers.
☐ The edges of the incision are reapproximated without undue tension.
☐ The surgical knots are tied squarely and securely.
☐ The suture is cut at an appropriate length.
SURGICAL EXERCISE 8

Repair of a Midline Episiotomy
HONOR WOLFE, MD

FORMAT: Bench model

LEARNING OBJECTIVE:
Repair a simulated midline episiotomy

MATERIALS REQUIRED:
• Terry cloth towel
• Suture with cutting needle (2-0 or 3-0 chromic, Dexon, Vicryl, or Polysorb) (The cutting needle is necessary to penetrate the towel easily.)
• Smooth tissue forceps (pick-ups)
• Straight needle holder
• Chair with cloth seat
• Chair or stool for the operator

NUMBER OF STUDENTS PER MODEL: 2
APPROXIMATE TIME FOR THE EXERCISE: 20–30 minutes

Exercise
Repairing a simulated midline episiotomy

The towel should be laid flat on the seat of the chair so that half the length of the towel is on the seat and half hangs over the edge of the chair toward the floor (Fig. 8.1A). The outer edges of the towel should be brought together in the midline (Fig. 8.1B) and then each side should be folded outward for a distance of about 2 in. (Fig. 8.1C). This folding pattern creates three layers of simulated tissue in the midline. With the towel hanging over the edge of the chair, the layers approximate those of the vagina and perineum. The instructor should demonstrate the proper technique for repairing a midline episiotomy (Fig. 8.2). The student then should repeat the exercise.

Checklist of essential skills
☐ The student mounts the surgical needle on the needle driver correctly.
☐ The student holds the tissue forceps correctly.
☐ The student manipulates the simulated tissue to create the best angle for placement of the suture.
☐ The simulated vaginal tissue is reapproximated with a continuous suture technique.
☐ The deep layer of the simulated perineum is reapproximated with interrupted sutures.
The superficial layer of the simulated perineum is reapproximated with a continuous suture technique.

The simulated skin edges are reapproximated with a continuous or simulated subcutaneous suture technique.

The student ties each suture with a secure square knot.

Fig. 8.1. Towel folded to simulate the vagina and perineum (A–C).
Fig. 8.2. Repair of midline episiotomy (A and B).
SURGICAL EXERCISE

Isolation and Ligation of Blood Vessels

 Patrick Duff, MD

FORMAT: Placenta model

LEARNING OBJECTIVES:
1. Isolate, divide, and ligate a blood vessel
2. Isolate and ligate (without division) a blood vessel

MATERIALS REQUIRED:
• Worktable
• Placenta preserved in formalin
• Gloves
• Small-gauge suture (eg, 3-0 chromic, Vicryl, Dexon, Polysorb)
• Hemostats (three)
• Metzenbaum scissors
• Straight Mayo scissors

NUMBER OF STUDENTS PER MODEL: 2
APPROXIMATE TIME FOR THE EXERCISE: 20–30 minutes

Exercise 9-1 Isolating and dividing the vessel

The placenta should be placed, fetal side up, on an absorbent towel on the worktable. The student and his or her partner should first localize a large placental vessel and then isolate and clamp a 2-cm length of the vessel using two hemostats. The vessel should be divided with Metzenbaum scissors. Both pedicles then should be ligated with 3-0 suture. The ties should be placed with and without the aid of a passer.

Checklist of essential skills

☐ The student inserts the hemostats correctly beneath the vessel.
☐ The student clamps and cuts the vessel appropriately, leaving the tips of the hemostats exposed.
☐ The hemostat is held correctly to expose the tip as the suture is applied.
☐ The student correctly manipulates the instrument passer as the tie is placed around the tip of the clamp.
☐ The suture is tied with secure square knots.
☐ The ends of the suture are cut to an appropriate length.
Exercise 9-2  **Ligating the vessel without division**

The placenta is positioned as outlined previously. One student should first localize a large placental vessel and then insert a hemostat beneath the vessel. The jaws of the hemostat should be opened, and two separate lengths of suture should be placed within the jaws of the hemostat by the second student. The hemostat should be withdrawn, thus bringing both lengths of suture beneath the vessel. Each student should then tie one length of the suture so that the vessel is ligated securely.

**Checklist of essential skills**

- [ ] The student inserts the hemostat correctly beneath the vessel.
- [ ] The lengths of suture are cut to an appropriate length.
- [ ] The student places the sutures correctly in the jaws of the hemostat.
- [ ] The sutures are tied with secure square knots.
- [ ] The ends of the suture are cut to an appropriate length.
Ligation of a Tissue Pedicle

JULIAN SCHINK, MD

**FORMAT:** Simulated tissue model

**LEARNING OBJECTIVES:**
1. Clamp a tissue pedicle and secure it with a free tie placed freehand
2. Clamp a tissue pedicle and secure it with a free tie placed with a passer
3. Secure a clamped pedicle with a simple stick tie
4. Secure a clamped pedicle with a Heaney stitch

**MATERIALS REQUIRED:**
- Worktable
- Pieces of uncooked bacon
- Tissue clamps—Kelly, Carmalt, or Heaney
- Tissue clamp to use as a passer
- 0-gauge resorbable suture (free ties and stick ties): chromic, Dexon, Polysorb, or Vicryl

**NUMBER OF STUDENTS PER MODEL:** 2–4

**APPROXIMATE TIME FOR THE EXERCISE:** 30 minutes

**Exercise**

Ligating a simulated tissue pedicle

Several strips of uncooked bacon should be placed on the worktable. The instructor should demonstrate the proper method for placing a clamp across a tissue pedicle and then securing the pedicle with a free tie. The free tie should be placed first with the hand and then with the passer. The instructor then should clamp a tissue pedicle and secure it with a stick tie. Finally, he or she should clamp a tissue pedicle and secure the tissue with a Heaney stitch. After observing these maneuvers, the student should repeat each exercise.

**Checklist of essential skills**

☐ The student manipulates the clamp using a tripod grip.
☐ The student correctly clamps the simulated tissue pedicle.
☐ The student places a free tie around the tip of the clamp using his or her hand.
☐ The student places a free tie around the tip of the clamp with the aid of a passer.
☐ The student properly secures the simulated tissue pedicle using a stick tie.
☐ The student properly secures the simulated tissue pedicle using a Heaney stitch.
☐ The sutures are tied with secure square knots.
SURGICAL EXERCISE

Ultrasound-Guided Amniocentesis

HONOR WOLFE, MD

FORMAT: Simulated tissue model

LEARNING OBJECTIVE:
Perform an ultrasound-guided amniocentesis

MATERIALS REQUIRED:
- Worktable
- Frozen whole turkey breast
- Condoms
- Ultrasound gel
- 22-gauge spinal needle
- 10-cc syringe
- Nonsterile gloves
- Ultrasound machine

NUMBER OF STUDENTS PER MODEL: 2–4

APPROXIMATE TIME FOR THE EXERCISE: 15 minutes

Exercise
Performing simulated ultrasound-guided amniocentesis

The turkey breast should be placed in a plastic bedpan on an examination table. A condom should be filled with ultrasound gel, tied at the end, and then placed within the turkey breast. The surface of the ultrasound transducer should be covered with gel and placed within a glove. The instructor should wear gloves, hold the transducer on the surface of the turkey breast, and then guide the needle into the air bubbles in the condom, located in the interior of the breast. He or she should then remove the trocar from the needle and attach a 10-cc syringe to the needle. The student then should perform the same exercise.

Checklist of essential skills

☐ The student achieves visualization of the gel-filled condom (simulating the amniotic sac) within the turkey breast (simulating the maternal uterus).

☐ The student correctly aligns the transducer so that the needle is observed throughout its pathway into the gel-filled condom.

☐ The student removes the trocar from the needle.

☐ The student securely attaches the syringe to the needle.
Surgical Exercise 12

Principles of Electrosurgery

Julian Schink, MD

Format: Simulated tissue model

Learning Objectives:
1. Describe the distinction between “tissue cutting” and “tissue coagulation”
2. Describe the electrical waveform for cutting current versus coagulation current versus blended cutting current
3. Describe the difference between unipolar and bipolar cautery
4. Describe the role of the return electrode pad
5. Describe the appropriate power settings for the electrosurgical unit
6. Coagulate and cut tissue using an electrosurgical unit
7. Characterize the adjacent tissue injury with the different electrical currents

Materials Required:
• Worktable
• Absorbent pad for table
• Return electrode pad
• Electrosurgical unit
• Large piece of fresh uncooked liver

Number of Students per Model: 2–4

Approximate Time for the Exercise: 30 minutes

Exercise: Describing and using electrosurgery

The instructor should describe the mechanism of action and electrical waveform of cutting current versus coagulation current versus blended cutting current. The instructor should describe the difference between a unipolar and bipolar cautery system and explain the role of the return electrode in the former system. The instructor then should place a piece of liver on a return electrode pad; excise a segment of tissue using the coagulation, cutting, and blended cutting current; and characterize the adjacent tissue injury with each current. After viewing these demonstrations, the student should repeat the exercise.
Checklist of essential skills

☐ The student describes the distinction between tissue coagulation and tissue cutting.

☐ The student describes the electrical waveforms for cutting current, coagulation current, and blended cutting current.

☐ The student describes the difference between unipolar and bipolar cautery systems.

☐ The student describes the role of the return electrode pad in the unipolar cautery system.

☐ The student describes the proper power settings for the electrosurgical unit.

☐ The student effectively coagulates and cuts tissue using the different currents.
SURGICAL EXERCISE 13

Loop Electrosurgical Excision Procedure (LEEP)

JULIAN SCHINK, MD

FORMAT: Simulated live model

LEARNING OBJECTIVES:
1. Inject local anesthetic with epinephrine into simulated cervical tissue.
2. Select the proper cautery loop for selected procedures.
3. Perform four types of electrosurgical cervical excisions (see Figs 13.1–13.4)

MATERIALS REQUIRED:
- Uncooked chicken breast
- Electrode pad
- Colposcope (optional)
- Loop electrosurgical excision unit and cautery loops
- 3-cc syringe
- 25-gauge needle
- Vial of local anesthetic with epinephrine

NUMBER OF STUDENTS PER MODEL: 2

APPROXIMATE TIME FOR THE EXERCISE: 45–60 minutes

Exercise 13-1 Performing freehand excisions

The uncooked piece of chicken should be placed on a return electrode pad. The outline of the exocervix and external cervical os should be drawn on the chicken with a marking pen. The instructor should describe the appropriate settings (power, blend versus coagulation versus cut) for the LEEP unit that is used at his or her institution. The instructor should demonstrate freehand the four excisions illustrated in the figures and explain the typical indication for each type of excision. The student then should repeat each type of excision.

Checklist of essential skills
- The student selects the correct solution of local anesthetic and epinephrine.
- The student injects the local anesthetic/epinephrine solution into the simulated cervical tissue.
- The student correctly performs a simple circumferential excision (Fig. 13.1).
- The student correctly performs separate rectangular excisions on the anterior and posterior cervical lip (Fig. 13.2).
The student correctly performs a three-part excision (Fig. 13.3).
The student correctly performs a simulated excision of the exocervix and a portion of the endocervical canal (Fig. 13.4).

**Exercise 13-2**

*Excising while viewing through the colposcope*

The previous excisions can be repeated while the operator looks through the colposcope.

![Fig. 13.1. Circumferential excision.](image1)

![Fig. 13.2. Separate rectangular excisions on anterior and posterior cervical lip.](image2)

![Fig. 13.3. Three-part excision with loop electrosurgical excision procedure (LEEP).](image3)

![Fig. 13.4. Excision of exocervix and a portion of the endocervical canal.](image4)
SURGICAL EXERCISE 14

Principles of Laser Surgery

JULIAN SCHINK, MD

FORMAT: Simulated tissue model

LEARNING OBJECTIVES:
1. Describe the mechanism of tissue destruction with the CO2 laser
2. Describe the power settings on a CO2 laser
3. Select an appropriate spot size for tissue excision versus vaporization
4. Describe the concept of power density and explain how it correlates with spot size
5. Describe the appropriate safety precautions for laser surgery

MATERIALS REQUIRED:
• Worktable
• Absorbent pads to cover table
• CO2 laser
• Large piece of fresh uncooked liver

NUMBER OF STUDENTS PER MODEL: 2–4
APPROXIMATE TIME FOR THE EXERCISE: 45 minutes

Exercise

Demonstrating use of the laser

The instructor first should explain the mechanism of action of the CO2 laser and then demonstrate the power settings on the laser. The instructor should explain the concept of “spot size” and demonstrate the appropriate spot sizes for tissue excision and for vaporization. The instructor should explain the concept of “power density” and describe how it correlates with spot size. The instructor then should place a piece of uncooked liver on a worktable, set the laser at 10 W, and demonstrate excision of a piece of tissue. The exercise should be repeated at a power setting of 40 W, and the instructor should compare the adjacent thermal damage for each excision. Finally, the instructor should use the laser at a setting of 10 W, and then 40 W, to vaporize a 2 x 2–cm patch of liver to a depth of 2 mm. The instructor should compare the adjacent thermal damage at these two different power settings. After viewing these demonstrations, the student should repeat the exercises.
Checklist of essential skills

☐ The student describes the mechanism of action of the CO₂ laser.
☐ The student demonstrates the appropriate power settings on the laser.
☐ The student describes the appropriate spot sizes for tissue excision and vaporization.
☐ The student describes the concept of power density.
☐ The student describes appropriate safety precautions for use of the CO₂ laser.
☐ The student effectively excises and vaporizes tissue.