

**Vanderbilt University Medical Center**  
**Emergency General Surgery Service**  
Surgical Residency Rotation and Curriculum

**UNIT 14      MINIMAL ACCESS SURGERY**

---

**UNIT OBJECTIVES:**

1. Demonstrate an understanding of the applications and risks of minimal access surgery (MAS).
2. Demonstrate an understanding of the technical and physiologic principles of minimal access surgical techniques.
3. Develop specific technical skills and demonstrate proficiency in performance of basic laparoscopy, laparoscopic cholecystectomy, and other minimal access procedures.
4. Synthesize the principles of minimal access surgery into a practice philosophy conducive to the development and evaluation of future surgical techniques.

**COMPETENCY-BASED KNOWLEDGE OBJECTIVES:**

**Section One: Overview**

1. Differentiate between conventional open and scope-assisted surgery, including:
  - a. Anesthetic considerations
  - b. Effects of pneumoperitoneum
  - c. Differences in patient outcome
2. Discuss the physical limitations imposed on the user participating in minimal access surgery, including:
  - a. Two-dimensional perspective
  - b. Visual limitations of scope and monitoring equipment
  - c. Crucial importance of patient position and cannula position for optimum exposure
3. Understand strategies to offset the difficulties suggested in #2 above, including:
  - a. Proper alignment of eye-camera-instrument axes
  - b. Efficient biomechanics
  - c. Effective use of assistants
4. Analyze the factors affecting the decision to select a minimal access approach (as opposed to an open surgical approach) for a particular clinical problem.

**Section Two: Basic Laparoscopic Skills**

1. Discuss techniques for gaining access to the abdomen, including:
  - a. Veress needle
  - b. Open (Hassan cannula)
2. Describe the sequence of steps involved in establishing a pneumoperitoneum, including:
  - a. Selection of first puncture site
  - b. Initial entry via Veress needle or Hassan cannula
  - c. Tests to confirm entry into peritoneum

**Vanderbilt University Medical Center**  
**Emergency General Surgery Service**  
Surgical Residency Rotation and Curriculum

- d. Initial insufflation
  - e. Initial exploration of abdomen
  - f. Placement of additional trocars
3. List contraindications for laparoscopic surgery, and be able to explain why these conditions are considered relative or absolute contraindications.

**Section Three: Laparoscopic Cholecystectomy (LC)**

1. Discuss the indications and contraindications for laparoscopic cholecystectomy.
2. Describe the technical aspects of preparing for and operating on a patient undergoing LC.
3. Identify major considerations for the decisions involved in converting from laparoscopic to open cholecystectomy, including:
  - a. Difficulty identifying anatomy (i.e., common duct)
  - b. Poor visibility
  - c. Hemorrhage control
  - d. Evaluation and treatment of visceral or vascular injuries and adhesions
4. Select management options for handling bile duct injuries, including immediate and delayed diagnosis and treatment.
5. Specify the indications and technique for percutaneous cholangiography and common bile duct exploration (CBDE), including use of choledochoscopy.
6. Discuss management of the patient with common duct stones, including:
  - a. Choice of approach (open common duct exploration, versus laparoscopic CBDE, versus LC followed by/preceded by endoscopic stone extraction)
  - b. Timing of surgery
  - c. Safety and cost-effectiveness of each approach

**Section Four: Additional Laparoscopic Procedures**

1. Describe current theories, including advantages and disadvantages, regarding the use of MA anti-reflux procedures and myotomies.
2. Outline the potential benefits and limitations to:
  - a. Pre- and trans- peritoneal groin hernia repairs
3. Summarize other intra-abdominal laparoscopic procedures currently being performed, including:
  - a. Adrenalectomy
  - b. Gastrectomy
  - c. Splenectomy

**COMPETENCY-BASED PERFORMANCE OBJECTIVES:**

**Junior Level:**

**Vanderbilt University Medical Center**  
**Emergency General Surgery Service**  
Surgical Residency Rotation and Curriculum

1. Demonstrate familiarity with laparoscopic equipment, including setup and trouble -shooting:
  - a. Insufflator
  - b. Camera
  - c. Video equipment
2. Demonstrate understanding of basic principles of patient positioning and room setup for diagnostic laparoscopy and LC.
3. Perform entry of body cavities using open (Hassan cannula) and closed (Veress needle) access techniques.
4. Recognize when satisfactory pneumoperitoneum has been achieved. Demonstrate familiarity with danger signs (e.g., hypotension, hypercarbia) and appropriate action when patient does not tolerate pneumoperitoneum.
5. Perform MAS procedures of increasing complexity under supervision, including:
  - a. Diagnostic laparoscopy
  - b. LC
  - c. Laparoscopic appendectomy
  - d. Other procedures not requiring suturing or other advanced techniques
6. Demonstrate facility with laparoscopic suturing and knot-tying using a box trainer or other simulator.
7. Demonstrate the ability to convert from an MA to an open approach in a variety of surgical settings.
8. Perform appropriate preoperative work-up, and supervise postoperative care of patients undergoing laparoscopic procedures.

**Senior Level:**

1. List equipment needed for complex procedures, select instruments needed, set up room (including patient position) and equipment, troubleshoot equipment when malfunction occurs.
2. Demonstrate facility in endoscopic knot-tying, stapling, and suturing, either in a box-trainer, an animal model, or the operating room.
3. Participate in increasingly complex procedures under supervision, such as:
  - a. Laparoscopic splenectomy
  - b. Laparoscopic adrenalectomy
  - c. Laparoscopic inguinal hernia repair
  - d. Other advanced procedures
4. Demonstrate understanding of uses of endoscopic ultrasound and other intraoperative adjuncts.