Cognitive Domain
1. Spell and define the key terms
2. Differentiate between medical and surgical asepsis used in ambulatory care settings, identifying when each is appropriate
3. Describe several methods of sterilization
4. Categorize surgical instruments based on use and identify each by its characteristics
5. Identify surgical instruments specific to designated specialties
6. State the difference between reusable and disposable instruments
7. Explain how to handle and store instruments, equipment, and supplies
8. Describe the necessity and steps for maintaining documents and records of maintenance for instruments and equipment

Psychomotor Domain
1. Sanitize equipment and instruments (Procedure 21-1)
2. Prepare items for autoclaving
3. Properly wrap instruments for autoclaving (Procedure 21-2)
4. Perform sterilization technique and operate an autoclave (Procedure 21-3)
5. Perform sterilization procedures
6. Practice standard precautions

Affective Domain
1. Apply ethical behaviors, including honesty/integrity in performance of medical assisting practice

ABHES Competencies
1. Wrap items for autoclaving
2. Practice quality control
3. Use standard precautions
4. Perform sterilization techniques
MULTIPLE CHOICE

Circle the letter preceding the correct answer:

1. A sterile field is defined as an area:
   a. where the autoclave is kept.
   b. that is free of all microorganisms.
   c. where sterilized instruments are stored.
   d. that has been cleaned with a chemical disinfectant.
   e. in which only sanitized equipment can be used.

2. Instruments that are sterilized in the autoclave maintain their sterility for:
   a. 15 days.
   b. 20 days.
   c. 25 days.
   d. 30 days.
   e. 35 days.

3. Autoclave tape indicates that an object:
   a. has not been sterilized.
   b. contains a specific type of microorganism.
   c. has been exposed to steam in the autoclave.
   d. needs to be placed on its side in the autoclave.
   e. did not reach the proper pressure and temperature in the autoclave.

4. Material used to wrap items that are being sterilized in the autoclave must be:
   a. permeable to steam but not contaminants.
   b. permeable to distilled water but not tap water.
   c. permeable to heat but not formaldehyde.
   d. permeable to ethylene oxide but not pathogens.
   e. permeable to contaminants but not microorganisms.

5. Which of the following should be included in an equipment record?
   a. Expiration date
   b. Date of purchase
   c. Physician’s name
   d. The office’s address
   e. Date of last sterilization

6. Which of the following should be included in a sterilization record?
   a. Location of the item
   b. Number of items in the load
   c. Method of sterilization used
   d. Reason for the service request
   e. Results of the sterilization indicator

7. One instrument commonly used in urology is a(n):
   a. curet.
   b. tonometer.
   c. urethral sound.
   d. sigmoidoscope.
   e. uterine dilator.

8. Forceps are used to:
   a. cut sutures.
   b. dissect tissue.
   c. make incisions.
   d. guide instruments.
   e. compress or join tissue.
9. All packs containing bowls or containers should be placed in the autoclave:
   a. upright.
   b. under a cloth.
   c. on their sides.
   d. stacked on top of each other.
   e. with their sterilization indicators facing up.

10. Consult the material safety data sheet (MSDS) before:
    a. handling a chemical spill.
    b. reading a sterilization indicator.
    c. sterilizing an instrument in the autoclave.
    d. requesting service for a piece of equipment.
    e. disposing of a disposable scalpel handle and blade.

11. Why does the autoclave use pressure in the sterilization process?
    a. Pathogens and microorganisms thrive in low-pressure environments.
    b. High pressure makes the wrapping permeable to steam and not contaminants.
    c. Pressure must be applied to distilled water in order to release sterilizing agents.
    d. High pressure prevents microorganisms from penetrating the objects being sterilized.
    e. High pressure allows the steam to reach the high temperatures needed for sterilization.

12. Which of the following instruments are used to hold sterile drapes in place during surgical procedures?
    a. Directors
    b. Serrations
    c. Towel clamps
    d. Curved scissors
    e. Alligator biopsies

13. Notched mechanisms that hold the tips of the forceps together tightly are called:
    a. springs.
    b. sutures.
    c. ratchets.
    d. serrations.
    e. clamps.

14. After use, scalpel blades should be:
    a. sterilized in the autoclave.
    b. discarded in a sharps container.
    c. reattached to a scalpel handle.
    d. processed in a laboratory.
    e. wrapped in cotton muslin.

15. The instrument used to hold open layers of tissue to expose the areas underneath during a surgical procedure is a:
    a. retractor.
    b. scalpel.
    c. director.
    d. clamp.
    e. forceps.

16. Ratcheted instruments should be stored:
    a. open.
    b. closed.
    c. hanging.
    d. standing.
    e. upside down.

17. Medical asepsis is intended to prevent the spread of microbes from:
    a. one patient to another.
    b. the autoclave to the patient.
    c. the instruments to the physician.
    d. the inside to the outside of the body.
    e. the physician to the medical assistant.
18. A punch biopsy is used to:
   a. diagnose glaucoma.
   b. dissect delicate tissues.
   c. explore bladder depths.
   d. remove tissue for microscopic study.
   e. guide an instrument during a procedure.

19. The best way to test the effectiveness of an autoclave is to use:
   a. thermometers.
   b. wax pellets.
   c. autoclave tape.
   d. color indicators.
   e. strips with heat-resistant spores.

20. Which is a step in operating the autoclave?
   a. Stacking items on top of each other
   b. Filling the reservoir tank with tap water
   c. Filling the reservoir a little past the fill line
   d. Removing items from the autoclave the moment they are done
   e. Setting the timer after the correct temperature has been reached
### MATCHING

Match each key term with its definition.

<table>
<thead>
<tr>
<th>Key Terms</th>
<th>Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>21. ____ autoclave</td>
<td>a. surgical instrument used to grasp, hold, compress, pull, or join tissue, equipment, or supplies</td>
</tr>
<tr>
<td>22. ____ disinfection</td>
<td>b. a long instrument used to explore or dilate body cavities</td>
</tr>
<tr>
<td>23. ____ ethylene oxide</td>
<td>c. a gas used to sterilize surgical instruments and other supplies</td>
</tr>
<tr>
<td>24. ____ forceps</td>
<td>d. appliance used to sterilize medical instruments with steam under pressure</td>
</tr>
<tr>
<td>25. ____ hemostat</td>
<td>e. a surgical instrument with slender jaws that is used to grasp blood vessels</td>
</tr>
<tr>
<td>26. ____ needle holder</td>
<td>f. groove, either straight or crisscross, etched or cut into the blade or tip of an instrument to improve its bite or grasp</td>
</tr>
<tr>
<td>27. ____ obturator</td>
<td>g. a notched mechanism that clicks into position to maintain tension on the opposing blades or tips of the instrument</td>
</tr>
<tr>
<td>28. ____ ratchet</td>
<td>h. killing or rendering inert most but not all pathogenic microorganisms</td>
</tr>
<tr>
<td>29. ____ sanitation</td>
<td>i. to reduce the number of microorganisms on a surface by use of low-level disinfectant practices</td>
</tr>
<tr>
<td>30. ____ sanitize</td>
<td>j. a sharp instrument composed of two opposing cutting blades, held together by a central pin on which the blades pivot</td>
</tr>
<tr>
<td>31. ____ scalpel</td>
<td>k. a type of forceps that is used to hold and pass suture through tissue</td>
</tr>
<tr>
<td>32. ____ scissors</td>
<td>l. a small pointed knife with a convex edge for surgical procedures</td>
</tr>
<tr>
<td>33. ____ serration</td>
<td>m. a process, act, or technique for destroying microorganisms using heat, water, chemicals, or gases</td>
</tr>
<tr>
<td>34. ____ sound</td>
<td>n. the maintenance of a healthful, disease-free environment</td>
</tr>
<tr>
<td>35. ____ sterilization</td>
<td>o. a smooth, rounded, removable inner portion of a hollow tube that allows for easier insertion</td>
</tr>
</tbody>
</table>

### MATCHING

Match each instrument with its description.

<table>
<thead>
<tr>
<th>Instruments</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>36. _____ forceps</td>
<td>a. dissect delicate tissue</td>
</tr>
<tr>
<td>37. _____ scissors</td>
<td>b. hold sterile drapes in place</td>
</tr>
<tr>
<td>38. _____ scalps</td>
<td>c. grasp tissue for dissection</td>
</tr>
<tr>
<td>39. _____ clamps</td>
<td>d. make an incision</td>
</tr>
<tr>
<td>40. _____ retractors</td>
<td>e. transfer sterile supplies</td>
</tr>
<tr>
<td></td>
<td>f. cut off a bandage</td>
</tr>
<tr>
<td></td>
<td>g. excise tissue</td>
</tr>
<tr>
<td></td>
<td>h. hold open layers of tissue</td>
</tr>
</tbody>
</table>
IDENTIFICATION

41. Complete this table, which identifies four types of scissors and their use.

<table>
<thead>
<tr>
<th>Type</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>bandage scissors</td>
<td>a. dissect superficial and delicate tissues</td>
</tr>
<tr>
<td>b.</td>
<td></td>
</tr>
<tr>
<td>straight scissors</td>
<td>c.</td>
</tr>
<tr>
<td>d.</td>
<td>remove sutures</td>
</tr>
</tbody>
</table>

42. Complete the chart below by identifying one instrument used in each specialty.

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Instrument</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obstetrics, gynecology</td>
<td>a.</td>
</tr>
<tr>
<td>Orthopedics</td>
<td>b.</td>
</tr>
<tr>
<td>Urology</td>
<td>c.</td>
</tr>
<tr>
<td>Proctology</td>
<td>d.</td>
</tr>
<tr>
<td>Otology, rhinology</td>
<td>e.</td>
</tr>
<tr>
<td>Ophthalmology</td>
<td>f.</td>
</tr>
<tr>
<td>Dermatology</td>
<td>g.</td>
</tr>
</tbody>
</table>

43. Complete this table, which describes the most effective method of sterilizing various instruments and materials.

<table>
<thead>
<tr>
<th>Method of sterilization</th>
<th>Most effective for</th>
</tr>
</thead>
<tbody>
<tr>
<td>a.</td>
<td>minor surgical instruments, surgical storage trays and containers, bowls for holding sterile equipment</td>
</tr>
<tr>
<td>b.</td>
<td>instruments or equipment subject to water damage</td>
</tr>
<tr>
<td>c.</td>
<td>instruments or equipment subject to heat damage</td>
</tr>
</tbody>
</table>

SHORT ANSWER

44. Describe the process by which an autoclave sterilizes instruments.

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
45. What is the purpose of sterilization indicators? What factors may alter the results of a sterilization indicator?

46. What components must be properly set in order for the autoclave to work effectively?

47. List the guidelines that you should follow when handling and storing sharp instruments.

48. What is the purpose of autoclave tape?

49. Which method of sterilization is more effective: boiling water or the autoclave? Why?
50. Compare the qualities of medical asepsis and surgical asepsis.

---

COG TRUE OR FALSE? Grade: ___________

Indicate whether the statements are true or false by placing the letter T (true) or F (false) on the line preceding the statement.

51. _____ Equipment must be sanitized before it is sterilized.
52. _____ Autoclave indicator tape is 100% effective in indicating whether a package is sterile.
53. _____ It is the medical assistant’s responsibility to maintain complete and accurate records of sterilized equipment.
54. _____ The handle and blade of a reusable steel scalpel may be reused after being properly sterilized.

---

COG AFF CASE STUDIES FOR CRITICAL THINKING Grade: ___________

1. You are one of two medical assistants working in a small office that specializes in ophthalmology. There is one examination room. The office sees about 50 patients a week, with an average of 3 patients a week needing minor ophthalmologic procedures. The physician has asked you to order new instruments for the office for the next month. What are two of the instruments that you will order? What factors will you need to consider when placing the order?
2. Your medical office has one autoclave along with two pairs of sterilized suture scissors and adequate numbers of other instruments. In the morning, the physician uses one pair of suture scissors to perform a minor procedure. He tosses the scissors into a sink when he is finished, damaging the instrument. At noon, the autoclave suddenly malfunctions, and you put in a service request to repair it. In the afternoon, a patient comes into the office complaining that her sutures are painful. The physician decides that he must remove them right away. Right before the procedure begins, the physician drops the only sterile pair of suture scissors in the office before he can use them. Describe two possible plans of action you can take to help the patient who is still in pain.

3. The physician has just completed a procedure in which he used a disposable scalpel. How should you dispose of this instrument and why? Would it be appropriate to autoclave this scalpel to save money? Why or why not?

4. Your patient is about to undergo a minor office surgery and is concerned because she once received a facial piercing that led to a massive infection due to improperly sterilized instruments. Now, she is worried about the cleanliness of your office. How would you explain the precautions your office takes to ensure that all instruments and equipment are safe and sterile in a language that the patient can understand?

5. A package arrives at your office and you and your coworker are unable to open it. After looking around the immediate area, your coworker leaves the room and comes back with a pair of sterile operating scissors to open the package. Should you allow your coworker to use the scissors to open the package? What reason would you give your coworker for allowing or not allowing him or her to use the scissors?
6. Your office uses formaldehyde to sterilize some instruments. While transporting the instruments soaking in formaldehyde, you accidentally spill the formaldehyde. You are in a hurry and consider leaving the small amount of chemical on the floor until later. Would this be an appropriate action to take? Why or why not? How would you clean up this spill?
## PROCEDURE 21-1 Sanitize Equipment and Instruments

**Name:** __________________________  **Date:** __________  **Time:** __________  **Grade:** ________

**EQUIPMENT/SUPPLIES:** Instruments or equipment to be sanitized, gloves, eye protection, impervious gown, soap and water, small hand-held scrub brush

**STANDARDS:** Given the needed equipment and a place to work, the student will perform this skill with _________% accuracy in a total of _________ minutes. *(Your instructor will tell you what the percentage and time limits will be before you begin.)*

**KEY:**
- 4 = Satisfactory
- 0 = Unsatisfactory
- NA = This step is not counted

### PROCEDURE STEPS

<table>
<thead>
<tr>
<th>STEPS</th>
<th>SELF</th>
<th>PARTNER</th>
<th>INSTRUCTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Put on gloves, gown, and eye protection.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2. For equipment that requires assembly, take removable sections apart.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3. Check the operation and integrity of the equipment.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>4. Rinse the instrument with cool water.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>5. Force streams of soapy water through any tubular or grooved instruments.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>6. Use a hot, soapy solution to dissolve fats or lubricants left on the surface.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7. Soak 5 to 10 minutes.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>a. Use friction (brush or gauze) to wipe down the instruments.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>b. Check jaws or scissors/forceps to ensure that all debris has been removed.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8. Rinse well.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>9. Dry well before autoclaving if sterilizing or soaking in disinfecting solution.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>10. Items (brushes, gauze, solution) used in sanitation process must be disinfected or discarded.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

### CALCULATION

**Total Possible Points:** _________

**Total Points Earned:** _________ Multiplied by 100 = _________ Divided by Total Possible Points = _________ %

**PASS**  **FAIL**  **COMMENTS:**
- ☐  ☐

**Student’s signature** __________________________  **Date:** ________

**Partner’s signature** __________________________  **Date:** ________

**Instructor’s signature** __________________________  **Date:** ________
**PSY PROCEDURE 21-2  Properly Wrap Instruments for Autoclaving**

Name: ______________________________ Date: ________ Time: ________ Grade: ________

**EQUIPMENT/SUPPLIES:** Sanitized and wrapped instruments or equipment, distilled water, autoclave operating manual

**STANDARDS:** Given the needed equipment and a place to work the student will perform this skill with ________% accuracy in a total of ________ minutes. *(Your instructor will tell you what the percentage and time limits will be before you begin.)*

**KEY:**
- 4 = Satisfactory
- 0 = Unsatisfactory
- NA = This step is not counted

<table>
<thead>
<tr>
<th>PROCEDURE STEPS</th>
<th>SELF</th>
<th>PARTNER</th>
<th>INSTRUCTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assemble the equipment and supplies.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>2. Check the instruments being wrapped for working order.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>3. Obtain correct material for wrapping instruments to be autoclaved.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
<tr>
<td>4. Tear off 1 to 2 pieces of autoclave tape. On one piece, label the contents of the pack, the date, and your initials.</td>
<td>□</td>
<td>□</td>
<td>□</td>
</tr>
</tbody>
</table>
| 5. Lay the wrap diagonally on a flat, clean, dry surface.  
  a. Place instrument in the center, with ratchets or handles in open position.  
  b. Include a sterilization indicator. | □ | □ | □ |
| 6. Fold the first flap up at the bottom of the diagonal wrap. Fold back the corner to make a tab. | □ | □ | □ |
| 7. Fold left corner of the wrap toward the center. Fold back the corner to make a tab. | □ | □ | □ |
| 8. Fold right corner of the wrap toward the center. Fold back the corner to make a tab. | □ | □ | □ |
| 9. Fold the top corner down, making the tab tuck under the material. | □ | □ | □ |
| 10. Secure the package with labeled autoclave tape. | □ | □ | □ |

**CALCULATION**

Total Possible Points: ________

Total Points Earned: ________ Multiplied by 100 = ________ Divided by Total Possible Points = ________ %

**PASS**  **FAIL**  **COMMENTS:**
- □  □

Student’s signature __________________________ Date ________

Partner’s signature __________________________ Date ________

Instructor’s signature _________________________ Date ________
# Procedure 21-3

**Perform Sterilization Technique and Operate an Autoclave**

<table>
<thead>
<tr>
<th>Name: _______________________________</th>
<th>Date: __________</th>
<th>Time: __________</th>
<th>Grade: __________</th>
</tr>
</thead>
</table>

**Equipment/Supplies:** Sanitized and wrapped instruments or equipment, distilled water, autoclave operating manual

**Standards:** Given the needed equipment and a place to work the student will perform this skill with ________% accuracy in a total of ________ minutes. *(Your instructor will tell you what the percentage and time limits will be before you begin.)*

**Key:**

<table>
<thead>
<tr>
<th>4 = Satisfactory</th>
<th>0 = Unsatisfactory</th>
<th>NA = This step is not counted</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Procedure Steps</th>
<th>Self</th>
<th>Partner</th>
<th>Instructor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Assemble the equipment including the wrapped articles. Refer to the manufacturer's manual for information specific to the model of autoclave you are using.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>2. Check the water level of the autoclave reservoir and add more if needed.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>3. Add water to the internal chamber of the autoclave to the fill line.</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>
| 4. Load the autoclave:  
  a. Place trays and packs on their sides, 1 to 3 inches from each other.  
  b. Put containers on the sides with the lids off.  
  c. In mixed loads, place hard objects on bottom shelf and softer packs on top racks. | ☐ | ☐ | ☐ |
| 5. Read the instructions, which should be available and close to the machine.  
  a. Close the door and secure or lock it.  
  b. Turn the machine on.  
  c. When the gauge reaches the temperature required for the contents of the load (usually 250°F), set the timer.  
  d. When the timer indicates that the cycle is over, vent the chamber.  
  e. After pressure has been released to a safe level, crack the door of the autoclave. | ☐ | ☐ | ☐ |
| 6. When the load has cooled, remove the items. | ☐ | ☐ | ☐ |
| 7. Check the separately wrapped sterilization indicator, if used, for proper sterilization. | ☐ | ☐ | ☐ |
| 8. Store the items in a clean, dry, dust-free area for 30 days. | ☐ | ☐ | ☐ |
| 9. Clean the autoclave following the manufacturer's directions. | ☐ | ☐ | ☐ |
| 10. Rinse the machine thoroughly and allow it to dry. | ☐ | ☐ | ☐ |
CALCULATION

Total Possible Points: _______  
Total Points Earned: _______ Multiplied by 100 = _______ Divided by Total Possible Points = _______ %

PASS  FAIL  COMMENTS:

☐  ☐

Student’s signature ________________________________ Date ________

Partner’s signature ________________________________ Date ________

Instructor’s signature ________________________________ Date ________