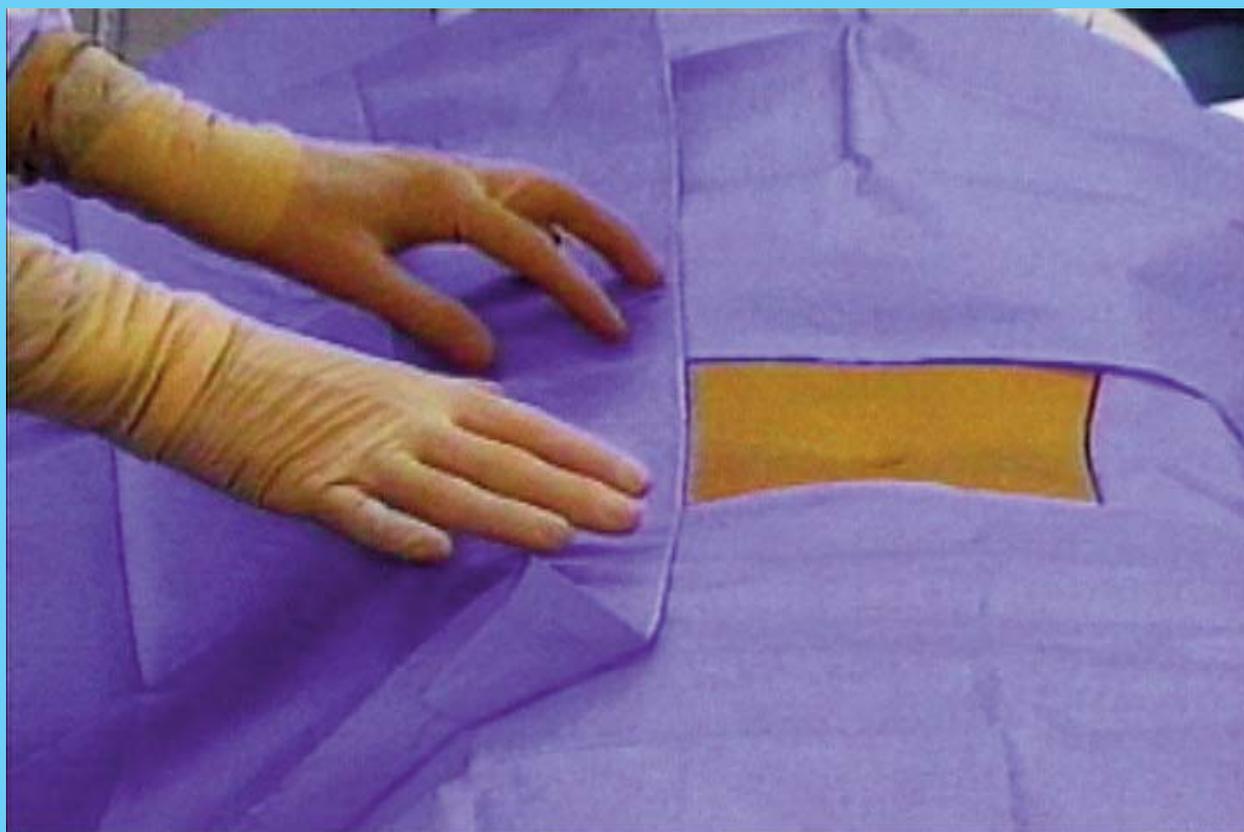


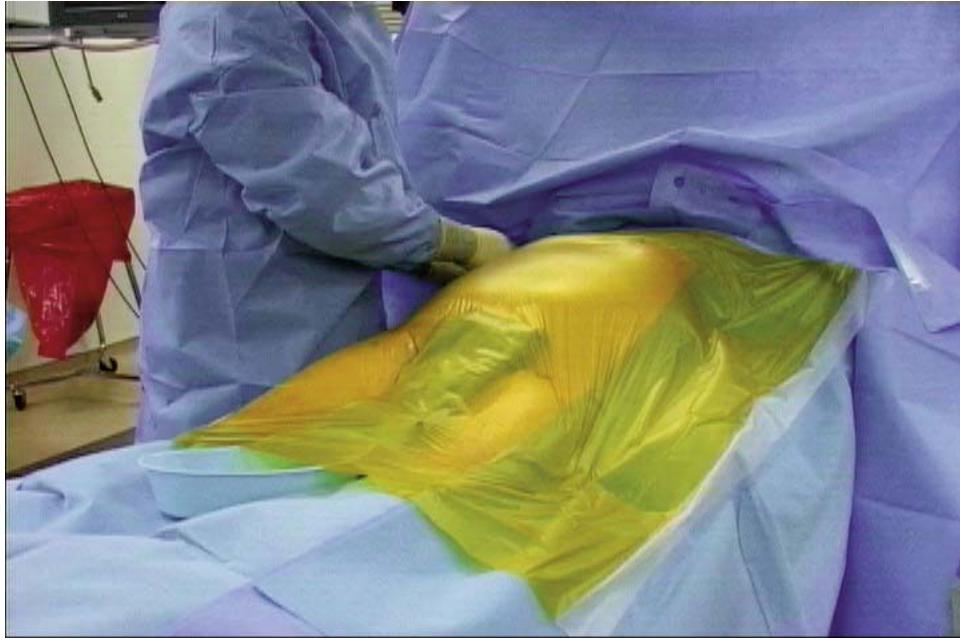
**SURGICAL DRAPING:  
PRINCIPLE AND PRACTICE**

**1938**



1938  
**SURGICAL DRAPING: PRINCIPLE AND PRACTICE**

**AORN VIDEO STUDY GUIDE  
AORN INDEPENDENT STUDY ACTIVITY**



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## GOAL

The purpose/goal of this activity is to enable the perioperative nurse to drape the patient for surgery while creating a sterile field for the operative site.

## OBJECTIVES

After viewing the video and completing the study guide, the learner will be able to

1. state the purpose of draping,
2. identify common draping materials,
3. describe basic draping techniques, and
4. discuss draping techniques for special procedures.

## GUIDE FOR STUDY

This study guide is intended to be used in conjunction with the accompanying video. We suggest that you take the following steps to complete this activity:

1. Read the introduction and objectives for this educational activity, and compare them with your own learning objectives.
2. View the video.
3. Read the study guide, paying particular attention to those areas that reflect the objectives.
4. Consult the bibliography for additional information.

## OVERVIEW

Draping the patient for surgery is an accepted infection control practice that requires the practitioner to understand and apply basic concepts in a variety of circumstances to achieve the goal common to all situations: a sterile field in which to perform the surgical procedure. A solid understanding of sterile technique and the creative ability to visualize how draping components may be used will aid the practitioner in goal achievement. Basic to the achievement and maintenance of a sterile surgical field is choosing draping materials that provide an effective barrier that precludes passage of microorganisms between nonsterile and sterile areas.

## INTRODUCTION

The ultimate goal of draping the patient for surgery is to create a sterile field surrounding the operative site. In turn, this sterile field aids in the prevention of a surgical wound infection by minimizing the passage of microorganisms. Surgical wound infections can be attributed to a variety of contributing factors. The most commonly recognized factors are age, weight, nutrition, the presence of existing infection or malignancy, immunosuppression, the length of time a surgical incision is open, the presence of foreign bodies in the surgical wound or other contamination, and the failure of aseptic barriers.

To date, there has been no research that definitively supports the use of barrier materials as essential to the prevention of surgical wound infection. Nonetheless, the use of sterile gowns and drapes is the current standard of practice. Surgical draping is theoretically accepted as reasonable practice. Surgical draping is a practice that can be more readily controlled than other factors that affect surgical wound infection.<sup>1</sup>

## HISTORY

Surgical drapes came into use in the late 1800s after the work of Pasteur and Lister enlightened the medical community to the importance of aseptic technique. At this time, clean linens were used to separate the surgical site from areas considered contaminated. Muslin, a coarsely woven cotton cloth, was commonly used. While questions were raised as early as the late 1930s as to the effectiveness of muslin as a barrier, it wasn't until 1952 that any substantiated evidence was presented.<sup>1</sup> Dr. William Beck's study effectively demonstrated the penetration and migration of bacteria through wet cotton drapes.<sup>2</sup> The common remedy for wet drapes became the application of additional layers over the wet area. Another study by Beck proved this practice to be ineffective.<sup>2</sup> These studies were the springboard for research and development of alternative materials for draping.

## Reporting Program

The first disposable drapes were made of paper-like materials and proved to be no more effective than their cloth counterparts in preventing fluid strikethrough. Since then, many nonwoven materials have been developed for the manufacture of disposable drapes. The textile industry responded to the call for more effective barriers by producing more tightly woven fabrics and chemical treatments that reduce the permeability of reusable cloth draping materials. Today there are many choices of engineered surgical textiles (reusable) and nonwoven engineered "fabrics" (disposable).

Surgical drapes are now considered a medical device, which means that they must meet a performance standard. The Association for the Advancement of Medical Instrumentation (AAMI) developed these standards. They are also subject to the medical device reporting requirements of the Safe Medical Devices Act of 1990 (SMDA) and/or the Federal Drug Administration (FDA) voluntary problem reporting program.

Today the surgical practitioner is charged with the responsibility of deciding what types of materials are the best of the many choices available. The challenge for perioperative nurses is to be knowledgeable regarding the performance requirements for draping materials. They must be knowledgeable of the current standards and stay informed of new product developments. Financial and ecological concerns are also part of the decision making process when considering drape selections.

## STANDARDS

AORN, Inc., first published performance requirements for barrier materials in the 1970s. These recommendations were supported by the American College of Surgeons (ACS). The FDA classified gown and drape materials as Class R Medical Devices, which required a performance standard to be adopted. In 1978, AAMI formed a committee to develop this standard. The multidisciplinary committee was unsuccessful at that time due to unresolvable issues among the groups represented. Since that time the Emergency Care Research Institute (ECRI) has produced the most comprehensive evaluation

of draping materials. ECRI's work includes information and supportive studies. AAMI has since developed comprehensive standards referred to by most manufacturers. AORN published an update of the "Recommended Practice: Protective Barrier Materials for Surgical Gowns and Drapes" in March 1992. AORN's current recommended practice is entitled "Recommended Practices for Selection and Use of Surgical Gowns and Drapes."

### CHOOSING DRAPING MATERIALS

The major characteristics to be evaluated in choosing surgical drapes, either disposable or nondisposable, are bacterial barrier effectiveness, strength, low lint generation, sterilizability, cost effectiveness, and flammability.

#### Barrier Quality

The ability of the drape to eliminate wicking is reliant on its repellent quality. Nonwoven disposable drapes are made with varying fluid resistance. Some are impervious as long as they remain intact. Many disposable drapes incorporate a layer of impervious material around the fenestration where fluid exposure is greatest. Some manufacturers of woven reusable drapes are also using more repellent reinforcement around the drape fenestration. Chemically treated cloth drapes are fluid-repellent but lose this quality with repeated laundering and sterilization. Use of a plastic incise drape over the fenestrated area of the woven drape is suggested as a means of ensuring an effective barrier.

Whenever woven reusable drapes are used, it is recommended that the manufacturer's guidelines for barrier life be followed. This means the number of washings and sterilizations must be monitored. The hospital must rely on the manufacturer's guidelines and their own observation of the barrier effectiveness during surgery. Drapes need to be chosen according to the anticipated blood and body fluid potential during surgery.

#### Strength

During surgical procedures, drapes may be subjected to abrasion and other stresses that have the potential for causing tears and punctures. Reusable drapes must be examined between uses for pinholes or tears and mended with heat-sealed patching materials of the same quality material as the original drape. Disposable drapes can be evaluated subjectively by attempting to tear them. The material should not tear easily.

#### Linting

Most lint particles are microscopic, making the evaluation of lint generation difficult. The concern with lint is that bacteria may attach themselves to lint particles and migrate into the surgical incision. ECRI studies show that blends of cotton and polyester result in lower linting than 100% cotton.<sup>3</sup> Disposable drapes produce as much lint as reusable drapes or even more, especially when subjected to abrasive forces.<sup>3</sup> Cutting drapes of any type is not advised, due to the increased release of fiber particles. Both cellulose and cotton fibers can cause granulomatous peritonitis or embolize arteries.<sup>3</sup>

#### Sterilizability

Most health care facilities use either steam or ethylene oxide to sterilize drapes. This involves primarily woven reusable textiles. Manufacturers use ethylene oxide and radiation technology.

#### Cost Effectiveness

Although cost should not be the single determinant for choosing a drape, in the current economic environment, fiscal responsibility dictates that the cost have some bearing. However, cost is considered only after determining that both patient and employee safety have been ensured.

#### Flammability

All drapes pose a fire hazard. Although drapes may meet fire resistance standards, the oxygen-enriched atmosphere during surgery increases flammability when drapes are exposed to heat and light sources (ie, electrosurgical devices, lasers, fiberoptic light cords). Drape fabrics absorb and retain oxygen. In the oxygen-enriched

atmosphere of the operating room, even fabrics (eg, many plastics) that do not normally burn in ambient air will ignite. The density of cloth drapes makes them slow to ignite but also more difficult to extinguish. The surgical team must be acutely aware of surgical drapes as a fuel. Scrupulous care must be taken when using ignition sources such as fiberoptic lights sources, lasers, and electrosurgical units.<sup>4</sup>

### CHOOSING COMPONENTS

Complete draping product lines are available in either woven (reusable) fabrics or nonwoven (disposable) materials, although most are now disposable. Choosing a single product line or manufacturer may be difficult because each company will offer many different packs and configurations. A sterile field can be achieved with either reusable or disposable products. A combination of products may be necessary to meet the needs of surgical draping.

The following is a summary of the various types of draping components and their common uses:

- ◆ Towels are most often used to define the incision site. Disposable towels usually have an adhesive strip that holds them in place when applied. Woven towels (cloth) are held in place with suture, staples, or towel clamps. Nonperforating towel clamps are recommended.
- ◆ Fenestrated drapes come in many styles and may even be a specific design for certain procedures. (ie, laparotomy drape, thyroid drape, peri-gyn drape, lithotomy drape). These drapes may also be adapted to a variety of incision (eg, a transverse laparotomy drape may be used as a thoracotomy drape; a thyroid drape may be adapted for use on other neck procedures). The drape should be long enough and wide enough to establish a wide sterile area, preferably covering the entire patient.
- ◆ Plain sheets come in various sizes and are called by a variety of names: draw sheets, 3/4 sheets, half sheets, bar drapes, or universal drapes. Plain sheets can be used for a complete draping sequence, for surgery on an extremity or to provide a wider area of coverage. Plain sheets are often used over

armboards for additional coverage.

- ◆ Plastic drapes are commonly used when the need for fluid resistance is high. Plastic drapes can be used to provide a fluid-resistant layer beneath less repellent drapes. The plastic incise drape is often used to provide an impervious barrier at the incision site. Incise drapes have an adhesive backing that is applied to the skin. The skin incision is made directly through the plastic. Some of these incise drapes are treated with an antimicrobial as an additional measure of protection to the patient against bacterial invasion.
- ◆ Tubular stockinette is often used to drape extremities. This allows for manipulation of the limb during the procedure. If the stockinette does not have an impervious covering and fluid exposure is expected, it is recommended that an impervious layer be added to prevent fluid strikethrough. It is further recommended that the limb beneath the stockinette be prepped in its entirety.

In addition, a variety of plastic pouches are available to use for fluid control and collection of irrigation. Some disposable fenestrated drapes incorporate incise drapes, fluid control pouches, or both into their design. Clear plastic drapes are made for draping equipment that cannot be sterilized. These drapes allow the surgical team to see the equipment, position and use the equipment more efficiently.

Most surgical nursing texts describe draping methods for specific procedures. Reviewing the literature will be helpful in planning how to adapt the drapes available for the procedures performed in your facility. Surgeon preference must also be considered when choosing draping components. Keep in mind that with some creativity, adequate draping can be achieved with a minimal number of drape styles.

## APPLICATION OF SURGICAL DRAPES

The application of surgical drapes is an exercise in basic aseptic technique. Principles to follow that will assist in successfully applying drapes and achieving a sterile surgical field are:

1. Ascertain that the skin around the incision site is dry to allow adherence of the drapes and to prevent wicking of moisture through the drapes.
2. Allow sufficient time and space to observe and maintain sterile technique.
3. Handle drapes as little as possible. Avoid shaking or flapping drapes.
4. Carry the drapes to the sterile field still folded, holding the drape higher than the OR bed.
5. Keep drapes above the area to be covered until properly placed. Discard drapes that fall below this level. Place in the proper position and unfold carefully and deliberately. Do not reposition drapes once in place.
6. If a drape becomes contaminated during the draping process, discard it without contaminating other sterile items.
7. Always maintain a safe distance from unsterile areas.
8. Protect sterile gloves by cuffing the drape over them.
9. Drape from the incision site (sterile) to the periphery (unsterile). Drape the area nearest you first. Do not reach across an unsterile area.
10. Use nonperforating clamps to secure items to drapes.
11. Whenever the sterility of a drape is in question, consider it contaminated.
12. Should a drape become torn during a procedure, cover the contaminated area immediately with another sterile drape or plastic incise drape. Remove any contaminated instruments from the field.
13. At the end of the procedure, cover the incision with sterile dressings before removing the drapes.

## SPECIFIC DRAPING PROCEDURES

### Laparotomy

Draping for a laparotomy is one of the simpler draping techniques. Some basic principles apply to most draping procedures:

1. After prep solution has dried, place towels around the incision site. Drape the side closest to you first. Do not reach across unsterile areas. Secure with nonperforating towel clamps or self-adhesive incise drape.
2. Place the fenestrated sheet directly over the incision site and unfold carefully. Do not reposition the drape once it has been placed. Do not allow the drape to fall below table level until it is fully extended.
3. Have the circulating nurse and/or anesthesia care provider help position this drape over the patient's head or attach to IV poles.
4. Use additional sheets, if necessary, to cover the patient's arms if extended.
5. Use incorporated loops or nonperforating towel clamps to secure items to the drapes.
6. Draping for surgery on an extremity is more complex. Often it is necessary to have the limb free for manipulation during the procedure.
7. A circulating nurse supports the prepped limb while the sterile team member places an impervious stockinette over the foot.
8. Place an impervious sheet over the OR table and the nonoperative leg. A sheet with a U-shaped cutout fits around the top of the leg and serves to seal off the perineal area (if draping for a lower extremity).
9. A specially designed extremity sheet with a latex dam built into the fenestration conforms well to the leg.
10. Extend the ends of the sheet over the patient's torso and down over the foot of the table.
11. If an extremity drape is not available, plain sheets may be used.
12. Drape the foot with the stockinette. When using woven drapes, an impervious sheet beneath them provides a fluid barrier.
13. Place the first sheet over the table and the nonoperative leg, leaving a large cuff at the top.

14. Now, extend the stockinette to the desired level, and seal with impervious tape.
15. Bring a second sheet down around the limb, and secure it to the bottom sheet with nonperforating clamps.
16. Extend the upper end over the patient's body.
17. Procedures on extremities often involve copious irrigation.
18. Some drape sheets have built-in irrigation pouches for fluid control. Or, you can apply an irrigation pouch after the drapes are in place.

### SUMMARY

As with many nursing practices, there are many acceptable approaches to achieving practice goals. The methods of draping and the materials used vary widely. The desired outcome is a patient who recovers from the surgical event without the added stress of a surgical wound infection. Provision of a sterile surgical field through the use of careful aseptic technique in the application of surgical drapes is nursing practice that augments the achievement of this outcome.

## ENDNOTES

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## POSTTEST

**Multiple Choice:** Please choose the word or phrase that best completes the following statements.

1. **If a surgical drape is said to be impervious, it means**
  - a. it is fluid-repellent.
  - b. it will not allow the passage of any liquid through it.
  - c. it is sterile.
  - d. none of the above.
2. **Sterile surgical drapes must be**
  - a. fluid-resistant.
  - b. antibacterial.
  - c. resistant to abrasive forces.
  - d. a & c.
3. **Reusable woven drapes are made of**
  - a. 140 count cotton muslin.
  - b. polyester blend fabric.
  - c. 200 count percale cotton.
  - d. any of the above.
4. **Disposable nonwoven drapes**
  - a. are impervious to fluid strikethrough.
  - b. may be a combination of fluid-resistant and absorbent layers.
  - c. can be reprocessed.
5. **When draping a leg for a surgical procedure, an important consideration in choosing components is**
  - a. whether the surgeon will apply a cast at the end of the case.
  - b. whether the fracture is opened or closed.
  - c. the amount of expected fluid exposure.

6. **Factors that affect surgical wound infection that can be controlled by the surgical nurse are**
  - a. the patient's age and nutritional status.
  - b. the length of an operation and the presence of infection.
  - c. room temperature and patient attitude.
  - d. practice of aseptic technique and use of barriers between sterile and nonsterile areas.
7. **Research into the causes of surgical wound infection has proven that**
  - a. there is no significant relationship between the use of sterile barriers and the incidence of surgical wound infection.
  - b. there is a direct proportion between the length of an operation and increased surgical wound infection.
  - c. most surgical wound infections are caused by factors the surgical practitioner has no control over.
  - d. all of the above.
8. **The purpose of surgical draping is to**
  - a. create a sterile field around the incision site.
  - b. create a barrier to bacterial migration.
  - c. reduce the chance of postoperative wound infection.
  - d. all of the above.
9. **Nonsterile equipment that must be brought into the sterile field**
  - a. need not be draped if it will be there only for a short time.
  - b. need not be draped if it will not touch the patient.
  - c. must be draped with an impervious barrier.
  - d. must be draped with sterile material that provides a barrier to contamination.

**10. If fluid strikethrough occurs during a surgical procedure,**

- a. remove the drapes at once, reprep, and redrape the patient.
- b. cover the area with a sterile cloth towel.
- c. cover the area with a piece of impervious draping material.
- d. continue with the procedure and ask the surgeon to prescribe antibiotics for the patient postoperatively.

**11. 140-count cotton muslin**

- a. is an effective barrier only when dry.
- b. is never an effective barrier.
- c. was used for surgical drapes beginning in the late nineteenth century.
- d. a & c.

**12. When applying towels around the incision site,**

- a. it is important that the skin be dry.
- b. drape the area nearest you first.
- c. walk to the opposite side of the patient to place the last towel.
- d. all of the above.

**13. Sterile plain sheets are often used to**

- a. create a sterile field beneath an extremity.
- b. cover the hypothermia blanket.
- c. provide additional coverage and continuity to the sterile field.
- d. a & c.

**14. A contaminated area that is not a part of the surgical site**

- a. should be sealed off from the incision site.
- b. is not a concern because it is part of the patient.
- c. requires cancellation of the planned procedure.
- d. requires the patient to be given antibiotics preoperatively.

**15. Drapes that have absorbent qualities**

- a. should never be used.
- b. should be used whenever a large amount of blood loss is expected.
- c. should be used in combination with fluid-proof materials.
- d. can be covered with additional layers of cloth if strikethrough occurs.

**16. Cuffing is a term used to describe**

- a. a fold made in the drape to catch irrigation.
- b. a method of protecting the sterile gloves from contamination during the draping process.
- c. a way of holding the suture scissors when not in use.
- d. a type of surgical barrier.

**17. To correctly place a laparotomy sheet on the patient,**

- a. carry the sheet to the operative field while still folded.
- b. place the fenestration over the incision site.
- c. protect your gloves within the folds of the drapes as the drapes are extended over the patient's body.
- d. all of the above.

**18. Because of the risk of puncturing or tearing the drape,**

- a. allow cords and tubing to lie on the drapes unsecured.
- b. once an item is secured to the drape, do not move it.
- c. secure items to drapes with nonperforating clamps.
- d. use any of the three methods described above.

**19. Surgical drapes must meet certain standards for fire resistance. This means**

- a. they will not catch fire, only smolder.
- b. they will ignite only when subjected to open flame.
- c. they must be resistant to ignition and have a low rate of flame spread.
- d. it is safest to operate in ambient oxygen conditions.

**20. Shaking drapes out prior to placing them on the patient**

- a. improves the way they conform to the patient's body contours.
- b. is helpful in removing odors left from processing.
- c. can cause air turbulence that may transport microorganisms to the surgical site.
- d. will get the attention of the other members of the surgical team.

Surgical Draping: Principle and Practices  
Answer Sheet

| Question | Answer |
|----------|--------|
| 1        | B      |
| 2        | D      |
| 3        | D      |
| 4        | B      |
| 5        | C      |
| 6        | D      |
| 7        | D      |
| 8        | D      |
| 9        | D      |
| 10       | C      |
| 11       | D      |
| 12       | D      |
| 13       | D      |
| 14       | A      |
| 15       | C      |
| 16       | B      |
| 17       | D      |
| 18       | C      |
| 19       | C      |
| 20       | C      |