CCI CNAMB - Quiz Questions with Answers

Instrument Processing and Supply Management

1.

A load of instruments has just finished a sterilization cycle. What is the next step?

Open the sterilizer door when it is safe to do so, and leave the load untouched to dry for 15-60 minutes

Leave them in the closed sterilizer for 15-60 minutes to make sure they are completely dry

Open the sterilizer door, remove the load to a waiting cart, and allow them to dry for 10 minutes before putting them away

Open the sterilizer door and leave the items in the sterilizer for 2 hours to cool down before handling

Correct Answer: Open the sterilizer door when it is safe to do so, and leave the load untouched to dry for 15-60 minutes

The times required for cooling and drying are unique to each type of sterilizer and the type of items that are being sterilized. For example, large packages take longer. After they are dry and cool, they can be taken out and placed on a cart. If they are not completely cool and dry, the colder surface they are placed on can get damp from condensation and then the load is contaminated by strike-through moisture.

2.

Which is a type of class 1 chemical indicator for sterilization?

External striped indicator tape

An autoclave test pack

A Bowie-Dick card

A biologic indicator for implants

Correct Answer: External striped indicator tape

There are 6 classes of chemical indicators. Class 1 includes exterior visual indicators like striped tape. Class 2 includes autoclave test packs that test for air removal, such as the Bowie-Dick test. Class 3 includes single-variable indicators of one sterilization parameter. Class 4 is a multi-variable monitor strip with two or more sterilization parameters. Class 5 is a chemical indicator strip that reacts similarly to a biologic indicator with the parameters of sterilization. Class 6 is an emulating indicator that responds to all sterilization parameters using a 'process challenge device.'

3.

What should be done prior to immersing items in chemical sterilants?

They should be washed and completely free of blood or debris; they should then be rinsed and completely dried, using jets of air for any lumens

They should be rinsed and free of any visible organic matter, then dried and placed in the solution

They should be washed thoroughly, then placed in the chemical sterilant immediately after washing

There is no need for washing or rinsing, just place them in the sterilant and the enzymes will dissolve the organic matter

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Correct answer: They should be washed and completely free of blood or debris; they should then be rinsed and completely dried, using jets of air for any lumens

Always follow Instructions For Use (IFUs) for any item that needs to be chemically sterilized. Some items require precleaning before washing, some do not. Regardless, all items should undergo washing, rinsing, and drying prior to being immersed in a chemical sterilant. Ideally, they should also be manually inspected for any problems prior to being placed in the sterilant.

4.

What is a Bowie-Dick test?

A class 2 chemical indicator that is placed in prevacuum sterilizers in order to test whether or not all the air is removed during the cycle

A special test indicator that determines whether or not the ultrasonic is sterilizing instruments properly

A biologic indicator that must be placed in every sterilizer load that has implants

A class 1 chemical indicator that tests whether the steam in a gravity displacement sterilizer is a high enough temperature to kill all microorganisms and endospores

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Correct answer: A class 2 chemical indicator that is placed in prevacuum sterilizers in order to test whether or not all the air is removed during the cycle

A Bowie-Dick test is a class 2 chemical indicator that is used in every prevacuum sterilizer daily. It ensures that the air vacuum pump is working correctly to remove all air before steam is pumped in to sterilize packs of instruments at temperatures of 270-276 degrees. If the test fails, the sterilizer cannot be used until the problem is found and fixed.

5.

For open shelving in a storage area where sterile packs are kept, the highest shelf should be at least how far below the ceiling and sprinkler heads and how many inches above the floor?

18 inches, 8–10 inches

24 inches, 12 inches

20 inches, 12 inches

6 inches, 8-10 inches

Correct answer: 18 inches, 8–10 inches

AORN guidelines allow for closed or open shelves, racks, or cabinets in OR sterile storage rooms. They recommend that the bottom shelves be solid, however. There should be adequate air circulation around all instrument sets and packs. Other AORN guidelines for storage rooms vary and are recommendations. The required 18 inches below the ceiling is part of the environmental fire code, and the 8–10 inches above the floor facilitates mopping and environmental cleaning without risk of splashing.

6.

All of these are disadvantages of hydrogen peroxide plasma sterilization except which one?

Aeration is necessary

You can't use metal trays

Hydrogen peroxide and cellulose are incompatible

Hydrogen peroxide sterilization cannot be used on flexible endoscopes with lumens in the United States

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Correct Answer: Aeration is necessary

Items sterilized by hydrogen peroxide plasma sterilization do not require aeration. That is necessary with EO sterilizers. The other three answers are all disadvantages. Metal trays block radiofrequency waves, so they are contraindicated by this type of sterilization. Hydrogen peroxide and cellulose are incompatible, so you cannot use cotton fiber woven textiles or paper products. Finally, the US has not approved this method for use on flexible endoscopes.

7.

Each instrument set should be labeled, at minimum, with the following items:

Name of the set, date sterilized, and the batch lot number

Name of the set, how many instruments it has, and what time it was wrapped

Name of the set, who wrapped it, and what type of metal the instruments are

Name of the set, expiration date, and the batch lot number

Correct answer: Name of the set, date sterilized, and the batch lot number

These three things allow for ease in finding the set and for tracking its sterility.

8.

Which of these items would be considered a semi-critical item according to Spaulding's classification system?

An anesthesia laryngoscope blade

A total hip implant

A pair of Metzenbaum scissors

A pulse oximetry probe

Correct Answer: An anesthesia laryngoscope blade

The Spaulding classification system lists patient care items as critical, semicritical, and noncritical. Critical items have to be sterilized because they cross into sterile tissue. This tier includes items like endoscopes, surgical instruments, catheters, surgical implants, and needles. Semicritical items require at least high-level disinfection because they come in contact with mucous membranes and skin. They can be sterilized, however. Examples of semicritical items are anesthesia equipment, respiratory equipment, and blunt vaginal instruments. Noncritical items are only used externally and only contact intact skin. Examples include linens, food utensils, and blood pressure cuffs.

9.

A sales representative brings a loaner instrumentation set with necessary implants in it to the ambulatory surgery center minutes before the elective surgery is due to begin. He states it was sterilized at a nearby local facility and is ready for use. What do you do next?

Delay the surgery and take the set to central sterile processing for cleaning and terminal sterilization with biologic indicators

Take the set to central sterile processing for cleaning and flash sterilization with biologic indicators; delay the surgery slightly until it is done with IUSS

Take the instrument set to the OR and open it to the sterile field; proceed with surgery as planned

Explain the situation to the patient and get their written consent to use the set that was sterilized at the other facility, and once you have their consent, proceed with surgery as planned

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Correct answer: Delay the surgery and take the set to central sterile processing for cleaning and terminal sterilization with biologic indicators

Loaner instrumentation must be sterilized on site and is considered contaminated until processed. It should be decontaminated and processed according to the manufacturer's Instructions For Use (IFU). These sets should be brought to the facility to allow time for inventorying, decontaminating, and terminally sterilizing them without being rushed. Implants should never be flash sterilized unless there is no other option and surgery cannot be delayed.

10.

Which item would be considered "critical" according to Spaulding's classification system of patient care items' importance?

A hypodermic needle

A blood pressure cuff

A vaginal sound

A nasal cannula

Correct Answer: A hypodermic needle

The Spaulding classification system lists patient care items as critical, semicritical, and noncritical. Critical items have to be sterilized because they cross into sterile tissue. This tier includes items like endoscopes, surgical instruments, catheters, surgical implants, and needles. Semicritical items require at least high-level disinfection because they come in contact with mucous membranes and skin. They can be sterilized, however. Examples of semicritical items are anesthesia equipment, respiratory equipment, and blunt vaginal instruments. Noncritical items are only used externally and only contact intact skin. Examples include linens, food utensils, and blood pressure cuffs.

11.

When sterilizing items, where should the internal sterilizing indicator be placed?

Inside the package in a spot that will be most difficult for the steam or other sterilant to penetrate

Directly on top of the thickest part of the load being sterilized

To the side of the load being sterilized

Anywhere in the sterilizer, since the site is randomly chosen each time to test all areas of the sterilization chamber

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Correct Answer: Inside the package in a spot that will be most difficult for the steam or other sterilant to penetrate

The internal indicator should always be placed in the thickest, most difficult part of the pack for the sterilant to penetrate. However, it is important to remember that indicators do not guarantee sterility, they only guarantee that all the parameters for sterilization have been met.

12.

How should flexible endoscopes be stored?

In closed, dedicated cabinets at least 3 feet away from any sink, with all valves open and removable parts removed

In their original shipment cases, at least 3 feet away from any sink with all valves open and removable parts detached

In a closed, vented rigid container, immersed in chemical sterilant with all valves open and removable parts detached

In cabinets with doors in the endoscopy procedure room, 3 feet away from any sink

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Correct answer: In closed, dedicated cabinets at least 3 feet away from any sink, with all valves open and removable parts removed.

If a drying cabinet with HEPA filters is available, then that is the gold standard. At minimum, store flexible endoscopes in closed cabinets 3 feet away from sinks to prevent contamination from water droplets. All valves should be open and removable parts removed, but kept with the endoscope. The cabinets should be in a room adjacent to the endoscopy suite, but not in the procedure room itself. Original shipment cases should never be used because they are difficult to clean and were intended for shipment only. Endoscopes can be stored horizontally or vertically depending on their IFU and the design of the cabinets in the storage room. If vertical, they must be able to hang without coiling or touching the cabinet.

13.

After a reusable stainless steel instrument set is properly sterilized, how long can it be stored before the sterility expires?

Indefinitely, as long the integrity of the packaging is maintained and proper storage conditions are met

1 year, all stored instrument packs should be opened and re-sterilized after 1 year to maintain sterility and readiness

3 years, all stored instrument packs should be opened and re-sterilized after 3 years to maintain sterility and readiness

5 years, all stored instrument packs should be opened and re-sterilized after 5 years to maintain sterility and readiness

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Correct answer: Indefinitely, as long the integrity of the packaging is maintained and proper storage conditions are met

Sterility is event related, not based on a specific time frame. As long as the storage parameters set out in facility policy are met and the integrity of the packaging is maintained, packs are considered sterile indefinitely. However, expiration dates should be placed on packs containing items that are unstable, like medications or items that deteriorate over time. Storage rooms should be free of dust, vermin, extreme humidity changes, direct sunlight, and extreme temperatures. Packages should not be overhandled, punctured, or gotten wet.

14.

What are the two parts of a trocar system used for laparoscopic abdominal surgery primarily called?

Obturator and sheath

Blade and obturator

Tunneler and Cannula

Cannula and Lumen

Correct answer: Obturator and sheath

Trocars are made of two parts. The obturator can be sharp or blunt and is the part that penetrates the tissue. It is then removed and the sheath is left behind as a tunnel for endoscopic instruments to pass through into the abdomen. The sheath has a valve that prevents insufflation from leaking out of the abdomen. Some also have suction and irrigation ports.

15.

Which of these instruments would be most likely to be placed in a peel pack or pouch for sterilization?

A couple of hemostats

A weighted speculum

A pair of Weitlaners

Deavers

Correct answer: A pair of hemostats

Peel packs are used primarily for light, small, low profile surgical instruments. Hemostats would fit fine in a standard pouch with low risk of perforation. The other three types of instruments would usually be wrapped or placed in hard containers to prevent perforation, and due to their size.

16.

Which endospore is used to monitor the efficacy of ethylene oxide gas sterilizers?

Bacillus atrophaeus

Geobacillus stearothermophilus

Bacillus subtilis

Bacillus licheniformis

Correct Answer: Bacillus atrophaeus

Bacillus atrophaeus is used in a biologic test pack with each load of EO gas sterilizers. Geobacillus stearothermophilus is the endospore used in steam sterilizers.

17.

Liquid detergents used to clean instruments manually must have which two properties?

They must be anionic and have a near neutral pH

They must be nonionic and have an acidic pH

They must be cationic with a neutral pH

They must be nonionic and have a basic pH

Correct Answer: They must be anionic and have a near neutral pH

Alkaline detergents can stain instruments and acidic detergents can cause corrosion or pitting. Anionic detergents have a neutral charge and do not ionize in water.

18.

Which of these is a gram-positive bacterial endospore used for biologic monitoring in steam sterilizers?

Geobacillus stearothermophilus

Lactobacillus acidophilus

Staphylococcus aureus

Clostridium difficile

Correct Answer: Geobacillus stearothermophilus

Geobacillus stearothermophilus is used to test sterilizers that use pressurized steam. It is used daily and also with every load that contains implants.

19.

Which of these items would be considered noncritical according to Spaulding's classifications of patient care items?

Bed linens

An oxygen mask

An endotracheal tube

A vaginal speculum

Correct Answer: Bed linens

The Spaulding classification system lists patient care items as critical, semicritical, and noncritical. Critical items have to be sterilized because they cross into sterile tissue. This tier includes items like endoscopes, surgical instruments, catheters, surgical implants, and needles. Semicritical items require at least high-level disinfection because they come in contact with mucous membranes and skin. They can be sterilized, however. Examples of semicritical items are anesthesia equipment, respiratory equipment, and blunt vaginal instruments. Noncritical items only come in contact with intact skin and low-level disinfection is fine. Examples include linens, food utensils, and blood pressure cuffs.

20.

Weitlaners, Gelpis, Balfours, O'Sullivan-O'Connor, and Bookwalter are all examples of what type of surgical instrument?

Self-retaining retractors

Vascular clamps

Needle holders

Speculums

Correct answer: Self-retaining retractors

Self-retaining retractors hold the edges of an incision apart. They may have deep or shallow blades or hooks. They usually have ratchets or spring locks designed to keep them open. Some, like the Bookwalter, have many different sized blades and removable parts. Every part must be counted before surgery and accounted for at the end.

21.

All of these options are advantages of ethylene oxide sterilization except which answer?

It has a shorter sterilization cycle than steam sterilizers

It is noncorrosive

It leaves no film on items

It can sterilize plastics and other things that cannot withstand high temperatures

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Correct Answer: It has a shorter sterilization cycle than steam sterilizers

Ethylene oxide sterilization actually takes much longer than steam sterilizers. Other disadvantages include the following: It requires special equipment and the gas is expensive, and anything that absorbs gas has to undergo a specific aeration period. Toxic emissions, burns from liquid EO, and nasal and throat irritation from inhaled EO are potential hazards to personnel. Some advantages include that EO is noncorrosive, leaves no film, and can sterilize items that cannot stand the moisture and heat of steam sterilizers.

22.

These are all correct ways of handling powered instruments except which one?

Leaving a drill bit in a powered drill during cleaning and sterilization so the detergents and sterilants do not harm the inner parts of the drill

Setting a reciprocating saw on a mayo stand by itself with the safety on while not in use

Testing an oscillating drill before handing it to the surgeon for drilling into bone

Using a sterile towel to change a saw blade to avoid injury

Correct answer: Leaving a drill bit in a powered drill during cleaning and sterilization so the detergents and sterilants do not harm the inner parts of the drill

Never leave drill bits, saw blades, burrs, or other attachments in powered equipment after use. Not only are most drill bits, saw blades, and burrs disposable and sharp biohazards after use, but also leaving an attachment in place will inhibit proper sterilization of the instrument. The sterilant cannot work in small metal-on-metal spaces. The rest of the answers are correct actions. Always use the safety when the instrument is not in use. Always test the instrument before using it on a patient. Using a sterile towel or sponge to change sharp attachments can help prevent injury.

23.

These are all examples of the advantages of ozone gas sterilization except which one?

It is noncorrosive

It only requires oxygen, water, and electricity

Aeration is unnecessary

It is suitable for items that require a low temperature

Correct answer: It is noncorrosive

Ozone gas can be corrosive and will oxidize iron, brass, steel, zinc, copper, nickel, and bronze. It also destroys rubber and some plastics. Advantages include the fact that it is inexpensive and only needs oxygen, water, and electricity to run. Ozone reverts back to oxygen and water at the end of the cycle, so no toxic byproducts are released. Ozone can be toxic if inhaled, but the sterilizer will not open until it has reverted back to oxygen and water, so there is low risk to personnel. However, some sterilizers combine hydrogen peroxide and ozone. Pure ozone can cause headaches, dry throat/mucous membranes, and severe lung damage and exposure is regulated by OSHA. No aeration is necessary for instruments since ozone reverts quickly.

24.

In the middle of an ACL repair, the surgeon drops the drill guide on the floor. Since this is the 3rd ACL repair of the day, there is no replacement sterilized and he asks for the guide to be flash sterilized (IUSS). When the pan containing the instrument is brought into the room and opened, you notice water in the bottom of the closed container. The chemical indicator shows all parameters for sterilization were met. What should you do?

Pass the drill guide off sterilely to the sterile field; since the pan is closed and without a vented bottom, the water is considered sterile in IUSS

Ask that the instrument be flash sterilized again in another sterilizer; the drill guide and pan should be completely dry if the sterilizer is working correctly

Pass the drill guide to the sterile field; ignore the water, the instrument is too important and needed immediately to delay the surgery further

Pass the drill guide off to the sterile field, explain to the surgeon and anesthesia provider that another dose of prophylactic antibiotics is needed and why

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Correct answer: Pass the drill guide off sterilely to the sterile field; since the pan is closed and without a vented bottom, the water is considered sterile in IUSS

Containers often used in Immediate Use Steam Sterilization (IUSS) are vented only on the top and non-vented on the bottom. The instrument is placed in a basket-type cage that scrubbed personnel can grab without contamination. The instrument does not sit in the water at the bottom of the pan. However, because these items are intended for immediate use and the drying time is not included in the cycle, they may still be slightly wet and very hot. So, care must be taken.

25.

During a busy day in the OR, a circulating nurse is asked to help in central sterile processing between cases. When comparing a pair of biologic indicators, one processed with a sterilizer load and one unprocessed control indicator, they notice that the unprocessed control indicator has no microorganisms after incubation. What is the correct action?

Consider the entire sterilized load as unsterile

Do nothing, there should be no microorganism growth in the control

Take the load out of the sterilizer and let the packs cool before putting them away on the shelf

Look at the processed indicator and if the growth was killed by the sterilizer, the load is still fine since this indicator is more important than the control

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Correct answer: Consider the entire sterilized load as unsterile

If there is no growth in the control indicator, then the whole corresponding load must be considered not sterile. Both indicators have to be in sync with each other. The control has to show microorganism endospore growth and the processed indicator has to show no growth due to sterilization. If the control is inactivated, then the processed indicator could also have been inactivated prior to sterilization.

26.

Which statement, made by a central sterile processing technician, indicates the need for further education?

If you can't get an instrument all the way clean in decontamination, it's not that big of a deal because the sterilizer will take care of anything left behind

I have to look up the IFUs a lot because I have trouble remembering and memorizing the specific instructions for cleaning and sterilizing each instrument

I have to be really careful around the ethylene oxide sterilizer and let the packs breathe before I can touch them

I have to separate instruments made of different metals before they are cleaned or sterilized

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Correct answer: If you can't get an instrument all the way clean in decontamination, it's not that big of a deal because the sterilizer will take care of anything left behind

All debris must be removed from instruments during cleaning. Any instrument sterilized with patient debris is contaminated. The rest of the statements indicate proper education. It is okay to rely on IFUs because it ensures that the proper cleaning and sterilizing is completed each time.

27.

What type of sterilizer uses downward moving steam to force air from the sterilization chamber?

A gravity displacement sterilizer

A prevacuum sterilizer

An EO sterilizer

A vapor sterilizer

Correct Answer: A gravity displacement sterilizer

Gravity displacement sterilizers force steam into the sterilization chamber from the back and top of the chamber. Since air is twice as heavy as the steam, it gravitates to the bottom of the chamber while the steam stays on top. The steam continues to enter the chamber under pressure and forces the heavier air to exit through an outlet and filter at the bottom. When the steam reaches the correct temperature, the timer starts. Most types of gravity displacement sterilizers run from 250-254 degrees with a pressure between 15–18 psi.

28.

What is the main purpose of using proteolytic enzymatic detergents on instruments immediately following surgery?

To dissolve blood, protein, and any other dissolved debris from lumens and crevices of instruments before they dry

To disinfect instruments prior to another use

To remove debris from instruments prior to flash sterilizing them

To decrease the likelihood of corrosion from oxidation

Correct Answer: To dissolve blood, protein, and any other dissolved debris from lumens and crevices of instruments before they dry

Using a proteolytic enzymatic detergent decreases bioburden before it dries and makes decontamination easier. It also decreases the formation of biofilms and other growths that are resistant to decontamination and disinfecting.

29.

According to AORN recommendations, when should flexible endoscopes be leak tested?

When the Instructions For Use (IFU) say so, after any potentially damaging event, and before any newly bought, loaned, or repaired endoscope is used

With every endoscope after every use

With every endoscope before patient use

After any potentially damaging event. If leaks are found, send it for repair

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Correct answer: When the Instructions For Use (IFU) say so, after any potentially damaging event, and before any newly bought, loaned, or repaired endoscope is used

Leak testing looks for any external openings in an endoscope that might allow chemicals, water, or patient secretions/feces to enter delicate parts of the inner endoscope. These breaches can be huge infection risks. Leak testing can be done using dry or wet processes. Leak testing can save thousands of dollars in repairs according to one study done in 2010 and 2011. Not every endosope requires leak testing, so attention must be paid to the IFUs.

30.

Poole, Frazier, and yankauers are all types of what surgical tool?

Suction tips

Ear speculums

Vaginal speculums

Bowel staplers

Correct answer: suction tips

Poole suction tips are hollow tubes with an outer filter sheath. They are commonly used in open bowel surgery where lots of irrigation is used. Frazier tips are narrow angled tubes that come in various sizes. They are better for when small, concentrated amounts of fluid need to be suctioned. They are most commonly used in brain, ENT, and plastic surgeries. Yankauers are angled, hollow tubes that are larger than Fraziers and have a ball tip. They are used whenever copious amounts of fluid need suctioned quickly. They are a favorite for airway secretions and many general surgeries.

31.

Failure to rinse a chemically sterilized colonoscope with sterile distilled water can cause which patient condition?

Colitis

Crohn's disease

Diverticulosis

Perforation of the colon

Correct answer: Colitis

Anytime an endoscope is chemically sterilized, it must be thoroughly rinsed with sterile distilled water to remove traces of the sterilant. If not done, the traces of sterilant or high level disinfectant, will cause inflammation when introduced into the body. Regular tap water must not be used as it is not free of all microorganisms and can be a source of infection.

32.

What are the byproducts of hydrogen peroxide plasma sterilization?

Oxygen and water vapor

Ethylene glycol and carbon dioxide

Hydrogen gas and ethyl alcohol

Methane and nitrous oxide

Correct Answer: Oxygen and water vapor

Hydrogen peroxide plasma sterilization results in oxygen and water vapor as byproducts, so no aeration is necessary, such as with ethylene oxide sterilizers. Also, hydrogen peroxide requires much lower temperatures, so it is used for items that cannot tolerate the heat and moisture of steam sterilizers.

33.

What important special consideration must be taken into account with any instruments or supplies with lumens that are to be sterilized using ethylene oxide?

They must be blown out with air and force dried prior to sterilization.

They must be individually packaged in peel packs

They must be made of titanium as other metals cannot be placed in an EO sterilizer

The lumens must be flushed with distilled water directly prior to placement in the pack

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Correct Answer: They must be blown out with air and force dried prior to sterilization

All instruments to be sterilized with EO must be completely dry. EO gas combines with water to make ethylene glycol. Ethylene glycol is a strong acid that can cause red blood cell hemolysis if introduced into a patient. Particular attention must be paid to instruments or supplies with lumens since water can collect in them so easily.

34.

If surgical instruments are used on a patient with suspected prion disease, what solution should be used for presoaking instruments prior to decontamination?

Chlorine bleach

A proteolytic enzymatic detergent

Hydrogen peroxide

A mixture of vinegar and baking soda

Correct Answer: Chlorine bleach

Prions are proteins that cause Transmissible Spongiform Encephalopathies (TSE) such as Creutzfeldt-Jakob disease. Instruments used in these types of cases must be handled extremely carefully and decontaminated more stringently. Chlorine bleach is corrosive, so the instruments should not be soaked for more than an hour and they cannot be autoclaved with any chlorine solution because of the formation of extremely toxic chlorine gas. They must be rinsed before being autoclaved in a gravity displacement steam sterilizer for at least 1 hour or 18 minutes in a prevacuum sterilizer. Chlorine bleach is also known as sodium hypochlorite. Do not use bleach on endoscopes.

35.

All of these are appropriate ways of organizing equipment to be sterilized except which scenario?

Placing all packages completely flat

Placing porous materials such as a freshly laundered non-linting towel between nested basins

Making sure instrument sets don't exceed 12 pounds or 5.5 kilograms in weight

Placing a powered drill in a case provided by its manufacturer after lubricating

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Correct answer: Placing all packages completely flat

Smaller, flat packages should be placed on shelves vertically on their sides, not flat. Closed container systems with perforated bottoms and instrument trays are laid flat. This allows for drainage and prevents entrapment of air or water.

36.

Metzenbaum, Mayo, Tenotomy, Potts, Lister, and Iris are all types of what surgical instrument?

Scissors

Pick-ups

Clamps

Retractors

Correct answer: Scissors

Scissors are made in all shapes and sizes. They all have specific uses. For example, Metzenbaum scissors are designed for cutting delicate tissues and Iris scissors were initially used for ophthalmic surgery.

37.

In the middle of a surgical case, the surgeon drops on the floor an instrument for which there is no replacement. The case cannot be completed without this instrument. What should the nurse do?

Retrieve the instrument and ready it for Immediate Use Steam Sterilization (IUSS) by central sterile processing personnel

Inform the surgeon that they must continue the case without the instrument

Pick up the instrument with sterile gloves and replace it on the sterile field, but give the patient another dose of prophylactic antibiotics and document it in the patient record

Retrieve the instrument, take it to decontamination for cleaning and terminal sterilization, and delay the continuation of the case until it is done

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Correct Answer: Retrieve the instrument and ready it for Immediate Use Steam Sterilization (IUSS) by central sterile processing personnel

IUSS or flash sterilization is allowed in situations where there is no replacement for contaminated instruments when the case has already begun or cannot be delayed. However, it should not be used for routine terminal sterilization. According to AORN guidelines, the instrument should be thoroughly washed and dried before processing. The flash sterilization record should contain the date, time, patient name, sterilizer number, indicators, cycle parameters met, and the contents of the load. Surgical cases where IUSS are used increase the risk for surgical site infections, so this is a last resort.

38.

Instruments with anodized or ebonized finishes are most important for what type of surgery?

Laser surgery

Open bowel surgery

Spine surgery

Total joint replacements

Correct answer: Laser surgery

Anodized and ebonized finishes on instruments reduce or eliminate reflectivity when lasers are used. This can prevent eye damage and fires from starting from the reflection of laser beams.

39.

While assisting in central sterile processing, a nurse notices a technician mixing stainless steel instruments with titanium instruments while putting them in the ultrasonic cleaner. What should they do?

Inform the technician that mixing instruments of different metals in the ultrasonic can result in electrolysis and subsequent corrosion or etching

Do nothing, since it does not matter if instruments of different metals are mixed in the ultrasonic cleaner, it only matters in the sterilizer

Inform the technician that the ultrasonic cleaner does not work with titanium instruments.

Inform the technician that the ultrasonic cleaner does not work with stainless steel instruments.

Correct Answer: Inform the technician that mixing instruments of different metals in the ultrasonic can result in electrolysis and subsequent etching

Ultrasonic cleaners work by using sound waves to create tiny bubbles that are able to get into every crevice and serration of various instruments. In general, the manufacturers of ultrasonic cleaners give instructions to separate instruments of different types of metals so that electrolysis does not occur and cause etching and corrosion.

40.

Adsons, Debakeys, and Russians are all examples of what type of surgical instrument?

Pick-ups

Retractors

Needle holders

Vascular clamps

Correct answer: Pick-ups

Pick-ups are used for grasping and holding tissue. They are a type of tissue forcep that does not have a ringed handle like allis forceps or babcocks do. They are made in various shapes and sizes, and with or without teeth.

Intraoperative Care

41.

How do isopropyl and ethyl alcohol work to prep skin for surgery?

They denature proteins in cells by coagulating them

They bind with negative ions in cell walls and cause death

They cause oxidation and cause cell death by apoptosis

They cause cell death by creating an anaerobic environment

Correct answer: They denature proteins in cells by coagulating them

Alcohols are broad spectrum antimicrobials that denature and coagulate protein in cells. 70% concentration for several minutes is enough for skin antisepsis.

42.

According to AORN guidelines, what is the preferred method of delivering medications in vials to the sterile field?

Using a sterile transfer device

Removing the stopper and pouring

Drawing up all medications in syringes at the beginning of the day and squirting them on the sterile field when needed

The circulating nurse should clean the stopper with alcohol, then hold the vial up so the scrub personnel can take a sterile syringe and draw up the medication

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Correct answer: Using a sterile transfer device

Using sterile transfer devices such as sterile vial spikes, sterile syringes, and filter straws are the preferred method of medication transfer to the sterile field. Removing rubber stoppers is not recommended unless they are specifically designed to be removed. Drawing up medications should happen immediately prior to transfer to the sterile field and they should be labeled if not used immediately. Medications should be drawn up and placed on the sterile field as close to the time of use as possible. Verification of the medication name, dosage, and expiration date should be done concurrently with the scrub personnel. Holding vials for a scrub person to puncture the stopper with a needle puts personnel at risk for a needlestick injury.

43.

All of these are core principles of ERAS (Enhanced Recovery After Surgery) for gynecological surgery in the intraoperative phase except which one?

Routinely using nasogastric tubes to remove stomach contents and prevent postoperative nausea and vomiting (PONV)

Preemptively preventing postoperative nausea and vomiting (PONV) with a scopolamine patch

Maintaining a core body temperature above 36 degrees celsius

Avoiding giving too much IV fluid

Correct answer: Routinely using nasogastric tubes to remove stomach contents and prevent postoperative nausea and vomiting (PONV)

ERAS in gynecological surgery is a new, evidence-based approach to care in preoperative, intraoperative, and postoperative phases. Core principles of the intraoperative phase include choosing anesthetic agents that decrease PONV, promote rapid wakening, and decrease the need for opioids. Another core principle is the need to maintain normothermia or a core temperature above 36 degrees celsius/96.8 degrees fahrenheit. Avoiding fluid overload, preventing PONV with a scopolamine patch or other medication are two more principles. Lastly, new evidence discourages the use of routine nasogastric tubes because they've been associated with pneumonia, fever, and atelectasis. Other methods of preventing PONV are preferred.

44.

In the lateral position, where should the axillary roll be placed?

Under the rib cage posterior to the axilla

In the axilla

Under the upper arm, anterior to the axilla

Under the lower rib cage directly below the breasts in females and below the nipple line in males

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Correct answer: Under the rib cage posterior to the axilla

The axillary roll is a misnomer because it is never actually placed in the axilla. The lower shoulder should be brought slightly forward and the axillary roll should be put under the down side of the rib cage, posterior to the axilla. This places the weight of the upper torso on the rib cage instead of the shoulder and area around the brachial plexus to prevent nerve and blood vessel damage. Blood pressure should be taken on the lower arm.

45.

Every facility where lasers are used must have a laser safety officer and laser specific training for all employees. The area the laser is being used where there is the potential for injury is known as what?

The Nominal Hazard Zone

The Laser Safety Zone

The Laser Hazard Area

The Irradiance Zone

Correct answer: The Nominal Hazard Zone

The Nominal hazard zone is the space where the level of reflected, direct, or scattered radiation will exceed the maximum permissible laser exposure. Special applicable eye and skin PPE must be worn within the nominal hazard zone. The room where the laser is used is called the laser treatment-controlled area. Closing doors, covering windows, using stand-by mode, limiting OR traffic, using laser safety checklists, and having a laser safety officer in the room are all ways of maintaining safety around lasers.

46.

According to some studies, children have twice the rate of postoperative vomiting than that of adults. These are all other risk factors that increase the incidence of postoperative nausea and vomiting in children except which one?

Being a toddler

Surgery over 30 minutes

Being an adolescent

A history of PONV in family members

Correct answer: Being a toddler

Toddlers actually have less risk for PONV than school-age or adolescent children (any children over age 3). Longer surgeries and a family history of PONV are also both risk factors. The same assessment that is done on adults to determine the risk of vomiting should be done for children. The following are recommendations to decrease the risk of PONV: Regional anesthesia should be used whenever possible and general anesthesia avoided. Propofol is preferred over nitrous oxide and volatile anesthetics when appropriate. Opioid use should be minimized. Lastly, the patient should be kept well hydrated as this is shown to decrease the incidence of nausea and vomiting.

47.

Surgical site infections are lowest in cases where hair was:

- **not removed**
- clippered in pre-op 4 hours prior
- removed with depilatory cream
- shaved in the OR

Correct answer: not removed

Whenever possible, hair at surgical sites should be left alone. A large study of over 23,600 surgical wounds found a 2.3% infection rate when razors were used, a 1.7% infection rate when hair was clipped, and a 0.9% infection rate when hair was left alone. If fire risk is an issue, water soluble gel should be placed in the hair. Clipping hair is the best method of hair removal, but is recommended to be done prior to entrance to the OR. AORN also ranks depilatory hair removal methods as the same as hair clipping as long as they minimize damage to the skin. Razors are not preferred, but if used, hair should be shaved as near the time of incision as possible to decrease risk of infection due to nicks and abrasions.

48.

The supine position increases what in obese patients?

Intrathoracic pressure and cardiac workload

Respiratory function and tidal volume

Metabolism and medication absorption

Intracranial pressure and peripheral vascular resistance

Correct answer: Intrathoracic pressure and cardiac workload

Obesity increases intrathoracic pressure due to excessive weight in the chest and abdomen. The supine position increases blood flow and subsequently cardiac workload in all patients due to decreased gravity. This increased workload is particularly a problem for obese patients and especially ones who suffer from cardiovascular insufficiencies already. The supine position decreases respiratory function and tidal volume in obese patients. Metabolism and intracranial pressure shouldn't be affected greatly by this position.

49.

Prophylactic IV antibiotics should be given how soon before incision?

Within 1 hour of skin incision

3 hours before surgery to reach peak affect

Right as the incision is being made

As soon as the IV is placed in pre-op

Correct answer: Within 1 hour of skin incision

Prophylactic antibiotics should be given 30 min to 1 hour before an incision is made. This allows the antimicrobial agent time to get to therapeutic levels to attack microorganisms before colonization.

50.

Which of these would be considered a pressure point in both fowler's and semi-fowler's position?

The ischial tuberosities

The tibial tuberosities

The greater trochanters

The iliac crests

Correct answer: The ischial tuberosities

The ischial tuberosities, coccyx, sacrum, calcanei, scapulae, and olecranons would all be considered pressure points in these positions.

51.

The circulating nurse sees a certified surgical technician student unclip a towel clip off the drapes and hand it to the surgeon when they ask for one to retract the skin at the incision site. What should the nurse do?

Notify the scrub student and surgeon that that towel clip is considered contaminated since it was attached to the drapes

Do nothing, since towel clips are sometimes used as tissue retractors and it was convenient and ready on the sterile field

Get another peel pack of towel clips and give them to the scrub to replace the one that was holding the drapes closed

Remind the surgical technician student, in private, that towel clips are only to be used on towels and drapes and that they should have handed the surgeon an allis instead

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Correct answer: Notify the scrub student and surgeon that that towel clip is considered contaminated since it was attached to the drapes

Towel clips used to clamp drapes should not be removed in surgery unless completely necessary. The points are considered contaminated after clamping drapes, and the towel clip should be removed from the sterile field if it is unclamped.

52.

During anesthesia induction, which of these should the circulator do?

Turn off the music

Count with the scrub tech to save time

Open sterile supplies

Pour sterile saline and medications onto the back table

Correct answer: Turn off the music

During induction, the circulator should always be close to the patient to assist the anesthesia provider place and maintain the airway. Other tasks can and should wait. The music should be turned down when the patient is brought into the room to make communication easier and because the last sense patients lose when going under anesthesia is their hearing. This doesn't apply if the patient specifically requests music to decrease anxiety.

53.

What surgical wound class would a laparoscopic hysterectomy fall into?

Clean contaminated (class II)

Contaminated (class III)

Clean (Class I)

Dirty/infected (class IV)

Correct answer: Clean contaminated (class II)

In an uncomplicated laparoscopic hysterectomy, the surgical site is entered under controlled conditions and no sign of infection is encountered, so it would fall into the clean contaminated category. All vaginal surgeries are clean contaminated.

54.

What is the most common source of surgical site infections?

The surgical team

Contaminated instruments

Body hair that isn't removed

Forced air warmers

Correct answer: The surgical team

People are the main source of microorganism transfer in the OR. Contaminated instruments are the second most common source.

55.

Which nerve can be damaged if the lateral aspect of a patient's knee is allowed to rest against the bar of candy cane stirrups?

The common peroneal nerve

The saphenous branch of the femoral nerve

The sciatic plexus

The intermediate dorsal cutaneous nerve

Correct answer: The common peroneal nerve

The common peroneal nerve runs along the lateral edge of the fibula at the knee and is easily compressed by stirrup bars. The saphenous branch of the femoral nerve runs medially to the knee and upper calf. It can also be of concern with stirrups if they are the boot-type, but the common peroneal is of more concern with candy cane stirrups because of its location. The intermediate dorsal cutaneous nerve is in the foot.

56.

When prepping a breast, the circulating nurse knows that the breast tissue extends into the axilla and must be prepped in its entirety. The armpit is always prepped last according to clean-to-dirty technique. What is the portion of breast tissue that is in the axilla called?

The tail of Spence

The axillary breast

The breast tail

The Cooper tail

Correct answer: The tail of Spence

This portion of the breast extends to the middle of the axilla and is called the tail of Spence. Breasts are held up by Cooper ligaments. The anatomy of the breast is important when it comes time to locate and remove breast lumps.

57.

What is the rationale behind using sterile water instead of sterile saline as an irrigant when excising a cancerous tumor?

Sterile water destroys many remaining cancerous cells by lysing them

Sterile water allows the surgeon to see any oozing or bleeding spots better than saline

Sterile water is isotonic and less damaging to the surrounding tissues

Sterile water is bacteriostatic and will help prevent surgical site infections in a neutropenic patient

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Correct answer: Sterile water destroys many remaining cancerous cells by lysing them

Some surgeons use sterile water because of its hypotonic properties. It is believed that it lyses many remaining cancer cells that are left behind after the excision.

58.

In cataract surgery, what is it called when the cataract is broken up by ultrasonic vibration before being aspirated?

Phacoemulsification

Phagocytosis

Phagoemulsifying

Phacosynthesis

Correct answer: Phacoemulsification

In cataract surgery, the cloudy lens is broken up by ultrasonic vibration and aspirated out of the eye in pieces. This is called phacoemulsification. There are special phacoemulsifying machines with specialized handpieces and supplies. The phaco handpiece contains a hollow, disposable needle surrounded by a sleeve of silicone. The needle is placed into the anterior chamber of the eye after removing the anterior capsule with a cystotome. The needle is then activated and the cataract is broken up with vibration while the needle is cooled with a constant flow of Balanced Salt Solution saline (BSS). The cataract is then aspirated out of the eye and a new lens can be placed.

59.

Which of these patient populations is the most vulnerable to errors in medication dosage?

Geriatric patients

Patients with BMIs over 30

Females

Caucasian patients with red hair

Correct answer: Geriatric patients

Geriatric patients and pediatric patients are most at risk for medication dosing errors. Geriatric patients metabolize medications more slowly than other populations due to age. Anyone of any age with impaired liver and kidney function is at high risk due to slow metabolism of medication as well. All dosing should be based on weight to avoid overdosing. Geriatric patients are also likely to have polypharmacy or be taking additional supplements that may affect the medications they are given. Side note: Anecdotal evidence claims that red-headed patients actually require more anesthesia and pain medication, in many cases, than non-red-headed patients.

60.

Which of these is a proper way of protecting a laser fiber when not in use?

Covering the end of the fiber with a moist sponge

Clamping the fiber when not in use

Coiling and bending the fiber as small as possible to keep it on the sterile field

Completely submerging the fiber in saline on the back table

Correct answer: Covering the end of the fiber with a moist sponge

Fiberoptic laser clinical guidelines recommend keeping a moist sponge over the end of the fiber when the surgeon is not using it. It is also recommended to secure the end in a holster device to keep it sterile and also prevent fires. Clamping and bending a fiber more than the IFU states are ways to break a fiber. Fibers should be inspected for damage before and after each use to make sure no harm is done to the patient.

61.

There are 5 instances where surgical counts should always be done or reconciled. Which of these includes every instance?

Prior to the procedure, when new items are opened to the sterile field, when the first layer of closure begins and each cavity closure, before permanent relief of either the scrub or circulator, and when the instrument sets are put back together before sterilization

Right after the first incision, when the first body cavity is closed, at the end of the procedure, while the back table is being cleared before the trash is taken out, and when instrument sets are put back together before sterilization

Prior to the procedure, when new items are added to the sterile field, at the end of the procedure, when clearing the back table and readying instruments for decontamination, and before the scrub or circulator is permanently relieved

Prior to the procedure, when the first layer of closure begins, after each cavity closure, whenever more laps are opened to the sterile field, and at the end of the procedure

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Correct answer: Prior to the procedure, when new items are opened to the sterile field, when the first layer of closure begins and each cavity closure, before permanent relief of either the scrub or circulator, and when the instrument sets are put back together before sterilization.

Counts should also be done any time any member of the surgical team asks for one for clarification or notices a discrepancy. Closure should be stopped if there is any discrepancy and a search conducted for missing items. If they cannot be found, an x-ray must be ordered. Counts must be documented as incorrect with any actions taken if the item cannot be found. If a surgical item is retained, it is a sentinel event that must be reported to The Joint Commission. The surgeon should announce clearly whenever they place a counted item or instrument into a body cavity to help with count clarity and decreasing instances of RSIs. Items should always be counted out loud and viewed by 2 people (one must be the circulator). The circulating nurse informs the surgeon if the counts are correct or incorrect. All items that can be taken apart must be counted separately. All pieces of broken items must be accounted for. Preprinted sheets for counting should be used for specific instrument sets.

62.

Before passing off a sterile supply to the scrub person, all of these should be checked except which one?

The manufacture date

Package integrity

The correct size and type of item

The expiration date

Correct answer: The manufacture date

It is unnecessary to check the manufacture date if the expiration date is available and checked. Package integrity, the expiration date, product integrity (discoloration, settling), the correctness of the product for the procedure, and the sterilization chemical indicators (if applicable) should all be checked prior to adding them to a sterile field.

63.

A 35-year-old patient is undergoing a left temporal artery biopsy. What should be done to decrease fire risk?

Place a water soluble lubricant in the patient's hair near the surgical site

Use chloraprep to prep the surgical site

Tent the drapes around the patient's airway to keep oxygen under the drapes and away from the sterile field

Place the grounding pad far away from the surgical site to draw the current away from the airway

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Correct answer: Place a water soluble lubricant in the patient's hair near the surgical site

Water-based lubricant decreases the flammability of hair even in the presence of prep solutions. Hair should be left in place whenever possible. Surgical site infection data shows that fewer SSIs occur when hair is left alone versus clipped or shaved off.

64.

Endotrachial tubes for children less than 8-years-old are usually uncuffed. Why is this?

Because pediatric patients' larynxes sit higher than adults' and soft tissue at the level of the cricoid cartilage forms a loose seal; cuffs can cause damage and edema in this soft tissue

Because the amount of inhalation anesthetics used for children is not high enough to worry about waste anesthesia gases and it decreases trauma to the tissues of the larynx

Because of the risk of dislocation of the tube into the esophagus

Because pediatric airways are so small, a cuff could occlude the esophagus and erode into the thryoid

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Correct answer: Because pediatric patients' larynxes sit higher than adults' and soft tissue at the level of the cricoid cartilage forms a loose seal; cuffs can cause damage and edema in this soft tissue

Adult larynxes' smallest point is at the vocal cords. In pediatric larynxes, the narrowest point is below the vocal cords at the cricoid cartilage. Cuffs can cause inflammation and edema which will narrow the airway after surgery and can cause post-extubation croup or obstruction. Newly designed ET tubes have microcuffs that can be used for patients under 8 years of age.

65.

Near the end of a hysteroscopy and uterine polyp removal, the circulating nurse is comparing the amount of saline used with the amount in the suction container. They find that there is a discrepancy and 1600 milliliters of fluid are unaccounted for in the container. What should the nurse do?

Notify the surgeon as the uterus may be perforated

Nothing, it is probably on the floor or in the drapes

Turn the suction up to return more of the fluid from the uterus

Notify the anesthesia provider as they may want to insert a nasogastric tube

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Correct answer: Notify the surgeon. The uterus may be perforated.

Any discrepancy in inflow or outflow over 1500 ml in a hysteroscopy must be reported to the surgeon so the fluid can be accounted for. If the uterus is perforated, then fluid may enter the peritoneal cavity and cause problems with hypervolemia.

66.

A 58-year-old male patient is scheduled for an incision and drainage of his left knee due to a spider bite and infection with MRSA. The surgeon's preference card calls for a tourniquet. What would contraindicate tourniquet use in this instance?

The infection

The venom of the spider

The age of the patient

The patient's preference not to use one

Correct answer: The infection

Tourniquets shouldn't be used on dialysis sites, in diabetic neuropathy, in PVD, in sickle cell anemia, with severe infections, with blood clot history, with malignancies, with open fractures/crushing injuries, or with thighs larger than 100 cm in circumference. Tourniquets should be used cautiously with the very young and the very old. In the case of infection or coagulopathies, a bolus of the infection or a clot could be dislodged when the tourniquet is released.

67.

Which two nerve injuries are most common in the OR?

Ulnar nerve and brachial plexus injuries

Median nerve and solar plexus injuries

Femoral nerve and popliteal nerve injuries

Sciatic nerve and popliteal nerve injuries

Correct answer: Ulnar nerve and brachial plexus injuries

The ulnar nerve travels behind the elbow and serves the 3rd, 4th, and 5th fingers of each hand, as well as the muscles of the middle forearm. It is extremely superficial and is vulnerable to pressure and stretching from armboards and positioning. The brachial plexis is in the shoulder and is vulnerable due to abduction, movement, and pressure from positioning. Extreme positioning of the head (especially away from extended arms) and extending arms more than 90 degrees from the body can stretch and compress the brachial plexus.

68.

A 38-year-old patient is having ambulatory surgery to remove a breast lump she found while doing a self-examination. She has had lumps removed before and they have all been benign, so she is not worried about this one. The nurse knows which principle about breast masses and will plan the back table set up and specimen retrieval accordingly?

They are considered cancerous until proven benign; cancer precautions in back table set up should be taken

They are usually benign and there is no cause for concern due to this patient's history

They are usually benign and cancer considerations like maintaining separate instruments for closure and tissue that have not encountered the mass can be discarded because of the patient's history

The surgeon probably won't send the specimen down for identification since it isn't likely to be cancerous and will just cost the patient more money to have pathology tests run

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Correct answer: They are considered cancerous until proven benign; cancer precautions in back table set up should be taken

Every breast mass is considered cancerous until proven otherwise, no matter the patient's history. All precautions should be taken while removing the mass so that no cancerous cells are spread in the case that it does come back as a malignancy. Surgeons should always send specimens down if there is any risk of malignancy, despite the cost of pathology tests.

69.

A 25-year-old male is undergoing an ORIF of a left distal radius fracture. The surgeon requests an upper arm tourniquet. How should the arm be exsanguinated before the tourniquet is inflated?

By elevating the arm

With a sterile Esmark bandage

With a sterile ace wrap

By massaging the arm medially while inflating the tourniquet cuff

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Correct answer: By elevating the arm

Esmark and Ace bandages should never be used over a fracture. Massaging the arm is also contraindicated because it can cause tissue damage and it isn't an accepted way of exsanguination. Elevating the arm will provide adequate exsanguination.

70.

Which method of heat loss occurs when air currents pass over the patient's skin in the OR?

Convection

Conduction

Evaporation

Radiation

Correct answer: Convection

The four events that result in heat loss are convection, conduction, evaporation, and radiation. Convection involves air currents whisking away heat as they pass over the skin. Conduction involves heat loss when the patient is placed on something cool like an OR bed or gel pad. Radiation is when heat transfers from the patient to the atmosphere. Evaporation happens when the skin gets wet and then dries, creating a cooling effect.

71.

Which of these devices is important to prevent complications common to the reverse Trendelenburg position?

Sequential Compression Devices

Chest strap

Shoulder braces

Stirrups

Correct answer: Sequential Compression Devices

In the reverse Trendelenburg position, the patient is supine while the legs are lowered below the head. This position is usually used for laparoscopic surgery of the upper abdomen. Respiratory function is optimized to be similar to when the patient is standing, but venous circulation can be decreased due to gravity. So, SCDs are an important preventative tool for mechanical prophylaxis of DVTs in this position. A safety strap across the thighs would be a necessity in this position and a padded footboard should be considered. A chest strap would be contraindicated as it might not stay in place and could compromise the airway or dislodge the ET tube. Shoulder braces are no longer used in Trendelenburg position and would not even be necessary for reverse Trendelenburg. Stirrups would never be used in this position.

72.

Which surgical position causes the most injuries to lower extremity nerves?

Lithotomy

Lateral decubitus

Prone

Supine

Correct answer: Lithotomy

Lower extremity nerve injuries most commonly occur with prolonged lithotomy positioning. They are usually apparent within a few hours after surgery. The peroneal, sciatic, and femoral nerves are most often injured. The length of time in this position, whether or not it is high or low, and the type of stirrup all affect the likelihood of injury.

73.

After draping and creating a sterile field, but before incision, the surgeon decides that they need the drapes moved over several inches. What is the correct course of action?

Discard the drapes without contaminating, and redrape the surgical site with new drapes

Pick up the drapes, break the adhesive barrier, and move them where the surgeon directs; a good prep leaves a large enough sterile margin that the drapes can be moved safely

Move the drapes and open a prep stick sterilely for the surgeon so they can prep the new margin of the surgical site after the drape is in place

Do not move the drapes; use scissors from the back table to cut the drape to make the fenestration larger to incorporate the site the surgeon needs

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Correct answer: Discard the drapes without contaminating, and redrape the surgical site

Once drapes are in place, they should not be moved. If they are not placed correctly, new sterile drapes should be opened and placed.

74.

The circulating nurse brings back a patient undergoing a breast lumpectomy with needle localization to the OR. When prepping the patient's breast, the nurse notes a wire sticking out of the breast, loosely covered with gauze and tape. What is the proper way to prep this surgical site?

Remove the loose dressings, leave the wire in place, start prepping at the wire and move outward, prep the entire wire, without dislodging or pushing it in further, then the entire breast and a large swath around the breast, next prep the shoulder and past the midline of the sternum, and then prep down to the bed on the surgical side and prep the armpit last

Remove the loose dressings, remove the wire, start prepping at the incision site and move outward, then prep the entire breast and a large swath around the breast down to the bed, prep the shoulder and past the midline of the sternum, and then prep the armpit last

Prep the dressings and wire by saturating them with prep solution, then move outward from there and prep the entire breast, shoulder, and side down to the bed; prep the armpit last

Prep the breast, shoulder, and armpit first, then prep a large swath from the midline of the chest to the bed; remove the wire prior to incision

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Correct answer: Remove the loose dressings, leave the wire in place, start prepping at the wire and move outward, prep the entire wire, without dislodging or pushing it in further, then the entire breast and a large swath around the breast, next prep the shoulder and past the midline of the sternum, and then prep down to the bed on the surgical side and prep the armpit last

Needle localization is done under fluoroscopy in the radiology department. The wire is placed to direct the surgeon to the lump and must remain intact during prepping and surgery. The entire wire should be prepped after removing the temporary dressing and tape. Then the breast should be prepped in the usual fashion with the armpit prepped last. More than one prep stick may be needed.

75.

How much of the margin of a sterile wrapper is considered unsterile after it is opened?

1 inch

2 inches

0.5 inch

0.25 inch

Correct answer: 1 inch

The inside of the wrapper is considered sterile to within 1 inch of each edge. This is important when determining whether or not something has been contaminated and evaluating the margin of safety when opening items.

76.

Which class of microorganisms are most commonly associated with surgical site infections?

Staphylococcus

Pseudomonas

Clostridium

Helicobacter

Correct answer: Staphylococcus

Most surgical site infections are caused by the patient's own skin flora. Staph are gram-positive and are the most implicated in surgeries that are considered clean. Up to 20% of patients' skin flora is found in hair follicles and oil glands and cannot be killed by topical prep solutions. E. coli infections are common after GI surgeries.

77.

Counting surgical items during cases should always begin where and end where?

Begin at the sterile field and end at the kickbucket

Begin at the kickbucket and end at the sterile field

Begin at the back table and end at the kickbucket

Begin at the sterile field and end at the mayo stand

Correct answer: Begin at the sterile field and end at the kickbucket

Counting should always be consistent and start at the sterile field and work outward.

78.

What is the most correct way to send a frozen section to the laboratory for immediate tissue identification?

Hand-delivered in a sterile container with the specimen on a moist telfa pad

Hand-delivered in a container with 2% formalin

Hand-delivered or tubed to the laboratory in a sterile container with the specimen wrapped in a raytek

Hand-delivered to the laboratory in a basin of saline

Correct answer: Hand-delivered in a sterile container with the specimen on a moist telfa pad

Frozen sections are sent when immediate identification of a tissue or tumor is needed. They are quick-frozen, sliced, stained, and placed under a microscope as quickly as possible. The results are then called to the surgeon by the pathologist. These specimens should never be placed in formalin or saline, but should be kept moist on a telfa pad in a sterile container. Hand-delivering specimens makes sure they arrive safely and eliminates any problems with the vacuum tube that may arise. Never place a specimen in a counted sponge.

79.

What surgical wound class would a routine knee arthroscopy with no signs of infection fall into?

Clean (class I)

Clean contaminated (class II)

Contaminated (class III)

Dirty/infected (class IV)

Correct answer: Clean (class I)

Since the knee scope did not show signs of infection and the respiratory, GI, and GU tracts were not entered, this is a class I surgery.

80.

Which of these scenarios shows the best method of taking a patient's legs out of stirrups?

Two healthcare providers remove the legs slowly and simultaneously out of the stirrups, bring them together, and then slowly lower them to the OR table

One healthcare provider for each leg, one at a time, removes the respective leg from the stirrups and gently lowers it to the OR table

One healthcare provider stands at the foot of the bed, lifts the legs out of the stirrups simultaneously, and slowly lowers them to the OR table

One healthcare provider takes one leg out of the stirrups and slowly lowers it to the OR table, then repeats with the other leg

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Correct Answer: Two healthcare providers remove the legs slowly and simultaneously out of the stirrups, bring them together, and then slowly lower them to the OR table

According to the 2023 AORN guidelines, having two personnel and lowering legs slowly is best. Lowering or raising legs into stirrups rapidly can result in fluid volume shifts that contribute to changes in blood pressure and other circulatory changes. Raising or lowering legs one at a time can create torsional stress at the hip joint.

81.

What is the purpose of a retrobulbar block?

It blocks the ciliary ganglion and nerves to make the eye immobile and lowers intraocular pressure

It blocks the auriculotemporal nerve so that a myringotomy can be done under local anesthesia only

It blocks the facial nerve, so a blepharoplasty can be done under local anesthesia only

It blocks the facial nerve and causes paralysis and analgesia in the orbicularis oculi muscle and eyelid

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Correct answer: It blocks the ciliary ganglion and nerves to make the eye immobile and lowers intraocular pressure

Retrobulbar blocks are done when complete paralysis of the eye is needed. It can be done in conjunction with general anesthesia or by itself. It often consists of 2% or 4% lidocaine mixed with 0.75% marcaine. It is given behind the eyeball and causes paralysis and analgesia as well as lowers intraocular pressure. The surgeon may massage the eye after administration of the medication.

82.

Which areas of a donned surgical gown are considered sterile?

From the chest to the level of the sterile field, and 2 inches above the elbows to the cuffs of sleeves

From the chest to the hips, and 4 inches above the elbows to the edge of the gloves

From 1 inch below the neckline to the level of the sterile field, and 4 inches above the elbows to the cuffs of the sleeves

From the nipple line to the iliac crest, and 3 inches above the elbows to 1 inch of the cuff

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Correct answer: From the chest to the level of the sterile field, and 2 inches above the elbows to the cuffs of sleeves

Gowns are sterile from the chest to the level of the sterile field (usually waist height), and 2 inches above the elbows to the cuffs of the sleeves. The cuffs should be completely covered by the cuffs of sterile gloves. Sterile team members should keep their hands in view at all times over the sterile portion of the gown. Hands should never be placed in armpits because of sweat and decreased visibility. Changing levels at the sterile field should be avoided. If one surgical team member sits, then all should sit.

83.

Where is the most proper positioning for a safety strap in a supine patient undergoing abdominal surgery?

Across the thighs, 2 inches above the knees

Across the widest part of the hips

Across the chest at the nipple line

Across the lower legs, 3 inches below the knees

Correct answer: Across the thighs, 2 inches above the knees

Safety straps should be placed 2 inches above the knees and be snug enough to keep the patient secure, but not tight enough to put pressure on nerves or restrict blood flow. 2 fingers should be able to be placed comfortably beneath the strap to check for the correct tightness.

84.

A 67-year-old patient undergoing laser ablation of laryngeal papillomas is being intubated by the CRNA. The CRNA places the ET tube and then inflates the cuff using methylene blue dye. The circulating nurse is precepting a student who asks why the cuff must be filled with blue dye. Which is the best response?

It absorbs and disperses heat and decreases airway fire risk; it also makes it clear if the cuff has been punctured by the laser

It helps the surgeon clearly delineate where the ET tube is so he doesn't puncture it or laser it

It is an antimicrobial that keeps infection in the airway at bay

It fills the cuff better than air and puts gentle compression on the airway to decrease bleeding once the papillomas are removed

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Correct answer: It absorbs and disperses heat and decreases airway fire risk; it also makes it clear if the cuff has been punctured by the laser

Methylene blue absorbs and disperses heat and decreases fire risk. Filling the cuff with air like normal creates a reservoir of oxygen containing gas (an oxidizer) and increases fire risk. If the cuff is ruptured, the dye will make it immediately apparent.

85.

When should intraoperative specimens be collected by the circulating nurse?

As soon as it is removed from the body and the surgeon agrees

At the end of the surgery

When the surgeon begins closing the wound and has communicated what the specimen should be labeled

After the debrief with the surgeon after the surgery has concluded

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Correct answer: As soon as it is removed from the body and the surgeon agrees

The specimen should be collected as soon as possible. This ensures it is protected from getting lost, damaged, contaminated, and from desiccation and deterioration from sitting outside the body.

86.

The Schiller test in gynecological surgery involves the use of which of these dyes?

Lugol's Solution

Methylene blue

Crystal violet gram stain

Barium sulfate

Correct answer: Lugol's Solution

Lugol's solution is used to stain the vagina and highlight abnormal tissues that need to be biopsied. It is an iodine solution, so it should be used with caution in patients allergic to iodine or susceptible to iodism.

87.

A pediatric patient in the Post-Anesthesia Care Unit (PACU) starts to show signs of malignant hyperthermia. Their end tidal carbon dioxide has doubled, they are tachycardic, and their limbs are rigid. What medication should the PACU nurse obtain from the malignant hyperthermia cart and prepare to give immediately?

Dantrolene Sodium

Atropine

Verapamil

Docusate Sodium

Correct answer: Dantrolene Sodium

Malignant hyperthermia is a condition triggered by anesthetic agents—such as halothane, desflurane, enflurane, sevoflurane, isoflurane, ether, and succinylcholine—that leads to prolonged contraction of skeletal muscles, acidosis, high fever, and death, if not treated. Symptoms include unexpected tachycardia, muscle rigidity, increased end-tidal carbon dioxide levels, and a high fever. It most commonly starts within 30 minutes of the induction of anesthesia, but can occur postoperatively as well.

Dantrolene Sodium is the primary medication used to combat malignant hyperthermia by reducing the release of calcium ions in skeletal muscle and decreasing contractions and the associated symptoms of malignant hyperthermia. With IV administration, the dose is 1mg/kg and it must be reconstituted with sterile water with no bacteriostatic agent. There is also a newer, more rapidly dissolving form of Dantrolene called Ryanodex that is now available for use.

88.

Operating room personnel must always be aware of the physiological effects each surgical position has on every patient. What is one consideration that applies to all surgical positions?

Moving patients slowly into and out of surgical positions to maintain hemodynamic stability

Padding every bony prominence to decrease instances of pressure injury

Safety belts 2 inches above the knee in all surgical positions

Anesthetizing patients on the stretcher before positioning them on the OR table

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Correct answer: Move patients slowly into and out of surgical positions to maintain hemodynamic stability

Always move patients slowly so their body can compensate for different physiological changes due to positioning. We don't always pad every bony prominence unless it is going to have force exerted on it. Safety belts are not used in certain positions like lithotomy. We usually only anesthetize patients on stretchers in prone positioning.

89.

Which of these is a direct complication of allowing a patient to sit in a pool of prep solution, irrigation, urine, or feces for an extended period of time?

Skin maceration

Skin mottling

Skin ichthyosis

Epidermolysis bullosa

Correct answer: Skin maceration

Any time a patient is allowed to sit in moisture, the cell walls of individual skin cells weaken and the pH of the epidermis changes. If it is not corrected, maceration occurs. This is when the epidermis is saturated to the point that the connective tissue dissolves and can be easily torn apart. The epidermis dissolves and then exposes the dermis to injury from pressure, shearing, and contact with chemicals.

90.

During an ACL reconstruction versus repair, the surgeon decides that the ACL repair is not feasible and asks the circulating nurse to retrieve an allograft gracilis tendon. The nurse leaves the OR to go to the freezer and gets the requested tendon. What should be checked prior to opening the gracilis allograft?

The expiration date

The sterilization date and method

The donor identification

The blood type and Rh factor of the patient and donor

Correct answer: The expiration date

The FDA tracks all implants and allografts stringently. Implanting an expired allograft may necessitate reporting to the FDA and could cause the facility to lose its tissue establishment designation and the ability to store and use human allograft tissue. The mailers that come with allografts give information to the company for data collection and should be filled out accurately and completely. Lot and serial numbers, manufacturer, size, type, and placement of the implants should all be documented in the patient record and on the mailers. Before opening, allograft packaging should always be checked for integrity, any storage parameter indicators should be checked, and the expiration date should be checked. The name of the implant, size, and other specifications should also be verified with the surgeon prior to opening. The American Association of Tissue Banks (AATB) accredits and inspects facilities that store and use bone, ligament, cartilage, and tendon allograft to make sure they are compliant with FDA standards. Meticulous records are kept of donors and recipients.

91.

A patient undergoing a hemorrhoidectomy in the prone position has a history of symptomatic thoracic outlet syndrome. How will this affect your plan for positioning the patient?

Make sure the patient's arms are kept at their sides

Make sure their arms are kept in the 'surrender' pose on prone armboards with appropriate padding under the ulnar nerve

Make sure their thoracic spine is well supported

Make sure their hips are in proper alignment so the thoracic blood vessels and nerves aren't compressed

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Correct answer: Make sure the patient's arms are kept at their sides

Thoracic outlet syndrome involves the nerves and blood vessels between the collarbone, 1st rib, and sternum. These include the subclavian artery and vein, the vertebral artery, and the brachial plexus. When they get compressed either mechanically by wrong positioning or by inflammation. It can cause pain, numbness, weakness, muscle wasting (severe), and can lead to blood clots.

92.

These are all opioid analgesics except which one?

Propofol

Remifentanil

Morphine

Dilaudid

Correct answer: Propofol

Propofol is not an opioid. It is an IV anesthetic used in induction, maintenance, and also in just sedation. It has a rapid onset and rapid wakening time. Morphine, dilaudid, and remifentanil are all opioids commonly used as an adjunct to anesthesia. Morphine and dilaudid are commonly used for postoperative pain in the PACU.

93.

All of these are disadvantages of the Trendelenburg position except which one?

Decreased intraocular pressure

Increased intracranial pressure

Skin shearing

Decreased pulmonary compliance and tidal volume

Correct answer: Decreased intraocular pressure

The Trendelenburg position is a modification of supine where the feet are raised above the head. It is usually used with open or laparoscopic lower abdominal surgery to increase visualization. Skin shearing is a huge risk because the patient's skeleton may slide, but the skin remains stationary. The patient must be secured well to prevent this. Sticky memory foam pads with padded chest straps are becoming widely available for use for surgeries that use this positioning. Uncovered gel pads and beanbags are also options. Shoulder braces are discouraged because of injuries to the brachial plexus. In this position, blood pools in the chest and increases intraocular pressure and intracranial pressure. Secretions from lung bases are easily evacuated, but other than that, respiratory function is diminished. The diaphragm is pushed up into the lung bases which decreases tidal volume and pulmonary compliance. Fluid shifts can cause congestion and atelectasis within the lungs.

94.

A patient is being positioned supine for a laparoscopic cholecystectomy. The circulating nurse knows that for part of the procedure this particular surgeon likes to put patients in a steep reverse trendelenburg position. Other than safety straps around thighs and arms, what other positioning agent would be best at keeping the patient safely in place?

A padded footboard

Stirrups

A padded chest safety strap

A memory foam wedge pillow under the patient's head and shoulders

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Correct Answer: A padded footboard

In the reverse Trendelenburg position, the patient's head is 15-30 degrees higher than their feet. A padded footboard is recommended by AORN guidelines to prevent patients from sliding downward and also reduces chances of injury to the peroneal and tibial nerves from flexion of the foot.

95.

In which of these scenarios would you most likely expect to assist with a rapid sequence anesthetic induction and hold cricoid pressure?

A 46-year-old overweight female patient, with a history of gallbladder disease, Gastroesophageal Reflux Disease (GERD), and bipolar disorder, has a left knee arthroscopy.

A 16-year-old male patient, with a history of asthma and ADHD, has an ORIF of his distal radius.

A 77-year-old male patient, with a history of heart disease and COPD, has a lipoma removed from his upper back.

A 35-year-old female patient, with a history of lymphoma, has a tonsillectomy.

Correct answer: A 46-year-old overweight female patient, with a history of gallbladder disease, Gastroesophageal Reflux Disease (GERD), and bipolar disorder, has a left knee arthroscopy.

A history of heartburn caused by GERD is an indication that this particular patient is at an increased risk for aspiration due to the possibility of reflux of stomach acid and contents into the esophagus. Cricoid pressure would be used as a precaution against aspiration. It works by pressing the cricoid cartilage against the 6th cervical vertebra and compressing the esophagus closed to prevent stomach contents from refluxing into the trachea.

96.

Which of these is a correct demonstration of sterile technique and adding supplies to a sterile field?

Opening the first flap of a sterile wrapper away from you

Opening a package of lap sponges into a rigid, closed container system

Opening an osteotome from a peel pack into a sterile metal basin

Flipping a GI stapler aseptically onto the sterile field from the rigid plastic packaging

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Correct answer: Opening the first flap of a sterile wrapper away from you

Always open the first flap of a sterile wrapper away from you, then the sides, and then the last flap towards you. This ensures that the open contents are not reached over and contaminated at any point. Never open supplies into a rigid, closed container system because only the inner metal basket is considered sterile, not the sides. Never open metal instruments or blades into a metal basin as it can cause damage. Try never to flip staplers, endoscopic trocars, or delicate mechanical items onto the sterile field as they can be damaged and malfunction later. Blades and sutures should always be opened into the same spot for consistency. Gowning and gloving should take place from a mayo stand or somewhere separate from the back table.

97.

A breast mass has just been removed and the surgeon instructs that it is going to be sent for estrogen and progesterone receptor studies. How should the specimen be prepared and packaged before sending it pathology?

The mass should be placed in a sterile container filled with normal saline, labeled correctly, and sent down immediately with a runner

The mass should be placed in a sterile container filled with formalin, labeled correctly, and sent down immediately with a runner

The mass should be placed fresh in a sterile container, labeled correctly, and sent down immediately with a runner

The mass should be placed in a radioluscent container with a press and sent down fresh to x-ray and then to pathology

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Correct answer: The mass should be placed in a sterile container filled with normal saline, labeled correctly, and sent down immediately with a runner

Any time hormone receptor studies are done, the specimen must be kept in saline. Formalin is only for permanent sections. It could be sent down fresh with instructions to place it in saline, but it is better to place it in saline immediately to prevent desiccation. Placing the mass in a radioluscent container with a press is done when the surgeon wants to ensure they got the mass in its entirety by sending it to be x-rayed and interpreted by the radiologist.

98.

What should always be used whenever surgical smoke or laser plumes are created in surgery?

A smoke evacuation system

An on-off suction device

A bipolar bovie pencil

Moistened wet laps

Correct answer: A smoke evacuation system

Surgical smoke has been shown to contain toxic gases and byproducts, and even harmful pathogens. It can harm staff from multiple long-term exposures and can harm patients through the absorption of toxins. As patients absorb surgical plumes, it increases the level of methemoglobin and carboxyhemoglobin in their blood which, in turn, decreases the oxygen carrying capacity of the blood. They can have headaches, nausea, and double vision in post-op. A smoke evacuation system with ULPA and charcoal filters must be used whenever surgical smoke is created. In laparoscopic procedures, care must be taken to evacuate surgical smoke without disturbing pneumoperitoneum.

99.

Most modern ORs have Waste Anesthesia Gas (WAG) scavenging systems that reduce exposure risk to personnel. However, not all waste gases are able to be scavenged. Which of these is a risky behavior that will increase personnel exposure to waste anesthesia gases?

Turning on anesthesia gas flow before placing the mask on the patient

Routinely checking anesthesia equipment for leaks and loose connections

Measuring levels of WAG exposure every 6 months

Checking connections of ET tubes and for proper inflation

Correct answer: Turning on anesthesia gas flow before placing the mask on the patient

Waste anesthesia gas exposure can cause headaches, irritability, lethargy, drowsiness, nausea, and fatigue. Long-term exposure can cause miscarriage, birth defects, infertility, premature births, renal disease, liver disease, and cancer. WAG scavenging systems are not able to filter out all exposure. Gas can leak out of improperly inflated ET tubes, poorly maintained anesthesia machines, poorly fitting masks, defective tubing, and gas flow valves being left open. Anesthesia providers should use best practice techniques to minimize their exposure and the exposure of other personnel.