LEARNING OBJECTIVES

At the end of the session, the participants will be able to:

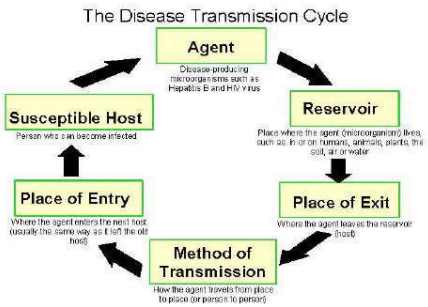
1. Identify who are at risk of infections in the health care facility
2. Explain how infections are transmitted among clients, health care workers, and the community via the health care setting
3. Discuss standard precautions and the recommended practices to ensure infection prevention
4. Demonstrate the appropriate infection prevention procedures to follow before, during, and after vasectomy

ADVANCE PREPARATION

- PowerPoint slides on "Infection Prevention"
- Computer, LCD, and projector screen
- Meta-cards
- Flip charts with easel sheets and/or whiteboard
- Markers

TOPIC	TEACHING/LEARNING PROCESS
SESSION 5 **INFECTION PREVENTION**	◆ Introduce the session by flashing the title slide.
OVERVIEW • Correct infection prevention techniques during the provision of vasectomy services is crucial to the safety of both clients and service providers. • This session provides the information necessary for participants to perform or supervise the infection prevention procedures used in providing NSV services.	◆ State the overview of the session as shown on the slide.

IMPORTANCE of INFECTION PREVENTION • Without proper precautions, your health facility can cause the spread of infections and diseases. • When providing health services, it is essential to prevent the transmission of infections at all times. • Over the past few decades, the world has seen increased outbreaks of disease that were once better controlled, and previously unidentified infectious agents that can cause incurable diseases, such as HIV and hepatitis C, have become a significant cause of illness and death in many parts of the world. • Such infections (HIV, hepatitis C) may be encountered/transmitted especially in the performance of surgical contraception as vasectomy.	◆ As presented on the next four slides, discuss the importance of infection as applied to vasectomy. ◆ Elaborate as needed.
IMPORTANCE of INFECTION PREVENTION Health care facilities are ideal settings for transmission of disease because: • Invasive procedures, which have the potential to introduce microorganisms into parts of the body where they can cause infections, are performed routinely. • Service providers and other staff are constantly exposed to potentially infection materials as part of their work. • Many people seeking health care services are already sick and may be more susceptible to infections. • Some of the people seeking services have infections that can be transmitted to others. • Services are sometimes provided to many clients in a limited physical space, often during a short period of time.	
IMPORTANCE of INFECTION PREVENTION With appropriate infection prevention practices, you can: • Prevent post-procedure infection, including surgical-site infections • Provide high-quality, safe services • Prevent infections in service providers and other staff • Protect the community from infections that originate in health care facilities • Prevent the spread of antibiotic-resistant microorganisms • Lower the costs of health care services, since prevention is cheaper than treatment	
IMPORTANCE of INFECTION PREVENTION • Infection prevention practices protect not only clients, but also clinic staff and the community. • It is important to remember that all clinic staff who have contact with blood and body fluids—from the physicians to the cleaners—are at risk of infection. • Most infections can be prevented if infection prevention procedures are followed.	



- Show the slide on the disease transmission cycle.
- Ask a participant to explain what the diagram means.
- Explain the diagram by telling participants the following:
  - The **agent** refers to infectious microorganisms (germs) that can cause disease. These microorganisms include:
  - Bacteria: Staphylococcus, Clostridia tetani, which causes tetanus
  - Viruses: Hepatitis B, HIV
  - Fungi and parasites
- These agents usually live in a **reservoir**, which can be in humans, animals, plants, soil, air, and water. In humans, the reservoir is usually the blood, body fluids, and tissues.
- The **place of exit** is the manner by which the agent leaves the reservoir and is transmitted from place to place or from person to person.
- The methods of transmission could be through the following:
  - Contact: Direct transfer of microorganisms through touch, sexual intercourse, fecal/oral transmission, and droplets
  - Vehicle: Materials that serves as a means of transfer of the microorganisms.

Vehicles can be blood (HIV, HBV) water (cholera, shigella), food (salmonella), or instruments and other items used during the procedures.

- Airborne: Carried by air currents (measles, TB)
- Vector: Invertebrate animals can transmit microorganisms (mosquito for malaria and yellow fever).

- The **place of entry** is the manner by which the agent enters another host. Usually, the mode of entry is the same way that the agent left the old host. The organisms can be passed through mucous membranes or broken skin, such as cuts and scratches, and puncture wounds from needle sticks with used needles.
- The next person who gets infected is the **susceptible host.**
- Emphasize to participants the following:
  - To prevent diseases caused by the agent (organisms that cause infection), the cycle must be broken at any point.
  - Breaking the cycle at any point requires infection prevention measures, which will be discussed in detail later.

HOW TO BREAK THE DISEASE TRANSMISSION CYCLE?

- **The mode of transmission is the easiest point at which to break the disease- transmission cycle in a health care facility.**
- **This can be accomplished by following appropriate infection prevention practices, such as hand washing, practising correct aseptic technique, correctly processing instruments and other items for reuse, and correctly disposing of the medical waste.**

- Discuss how the disease transmission cycle may be broken as presented on the slide.

WHO ARE AT RISK OF INFECTION?

- **Infection prevention is everybody's business.**
- **Just as everyone who works at a health care facility is at risk of infections, every health care worker has a role to play in practicing appropriate infection prevention.**
- **In order for infection prevention to be effective, each staff member must do his or her part.**

◆ Ask participants who could be at risk of infection.

◆ Discuss the risk to the client, the staff, and the community as shown on the next three slides.

RISK TO STAFF

- Service providers are at significant risk of infection because they are exposed to potentially infectious blood and other body fluids in a daily basis.
- Staff who process instruments and other items, clean up after procedures, clean operating theatres and procedure rooms, and dispose of waste are particularly at risk.
- Client-to-health care worker transmission can occur through exposure to infectious blood and other body fluids:
  - When a health care worker's skin is pierced or cut by contaminated needles or sharp instruments
  - When fluids are splashed on the mucous membranes of the health care worker (e.g., eyes, nose or mouth)
  - Through broken skin due to cuts, scratches, rashes, acne, chapped skin, or fungal infections

RISK TO CLIENTS

- **Clients are at risk of post-procedure infection when, for example, service providers do not wash their hands between clients and procedures, when they do not adequately prepare clients before a clinical procedure, and when used instruments and other items are not cleaned and processed correctly.**

RISKS TO THE COMMUNITY

The community is also at risk of infection when:

- Medical waste is improperly discarded—including contaminated dressings, tissue, needles, syringes, and sharps (needles and scalpel blades)
- Health care workers do not wash their hands before leaving the facility and then touch family members or household items
- Health care workers wear contaminated clothing from the facility to their home. Some infections can be spread by staff to their family members or others in the community.

Standard Precautions

◆ Tell participants the following:

- Standard precautions are designed for the safety and care of all people in a health care facility – whether a sick patient, a woman receiving IUD services, or a health care worker.
- The Standard Precautions principle instructs us to consider every person as potentially infectious. Hence, every person, including you, can transmit an infection.

◆ Elaborate on the different components and considerations in implementing the standard precautions.

- **Wash hands** – the most important procedure for preventing cross-contamination (person to person or contaminated object to person)
- **Wear gloves and other physical barriers**
  - Gloves are worn (on both hands) before touching broken skin (e.g., wounds and abscesses), mucous membranes, blood, or other body fluids (secretions and excretions), soiled instruments, and contaminated waste materials; or for performing invasive procedures.
  - Physical barriers (protective goggles, face masks, aprons, etc.) are worn if splashes and spills of blood or other body fluids are anticipated.

	· **Use antiseptic agents** properly. · **Process instruments, gloves, and other items** correctly using recommended procedures. · **Handle sharps correctly** by not recapping or bending needles and by disposing them in sharps containers. · **Safely dispose of infectious waste materials** to protect those who handle them and prevent injury or spread of infection to the community.
Infection Prevention Measures Standard Precautions ▪ Wash hands ▪ Wear gloves ▪ Use physical barriers ▪ Use antiseptic agents ▪ Use safe work practices ▪ Safely dispose of infectious waste materials ▪ Process instruments, gloves, and other items	◆ Summarize the components of standard precautions as shown on the slide.
HANDWASHING	◆ Tell participants the following: · Handwashing is the simplest and most important infection prevention procedure in any health care facility. · Handwashing removes many microorganisms from the skin, thus preventing the transmission of infection from person to person.
HANDWASHING Handwashing is one of the most important infection prevention measures. *When to Wash Hands:* · Immediately after arrival at work · Before examining a client · After examining a client · Before putting on gloves for clinical procedures · After touching any object that might be contaminated with blood or other body fluids · After removing gloves (gloves may contain small holes or tears) · After using the toilet or latrine · Before leaving work at the end of the day	◆ Ask participants at what particular instances do they wash their hands in their facilities. ◆ Write their responses on the board. ◆ Present the slides, and acknowledge responses given by participants.

HANDWASHING Handwashing is one of the most important infection prevention measures. *When to Wash Hands:* · Immediately after arrival at work · Before examining a client · After examining a client · Before putting on gloves for clinical procedures · After touching any object that might be contaminated with blood or other body fluids · After removing gloves (gloves may contain small holes or tears) · After using the toilet or latrine · Before leaving work at the end of the day	◆ Ask participants at what particular instances do they wash their hands in their facilities. ◆ Write their responses on the board. ◆ Present the slides, and acknowledge responses given by participants.
EXERCISE	Exercise: 1. Ask for three volunteers among the participants. 2. Ask the volunteers to wear the gloves provided. 3. Blindfold the volunteers. 4. Put poster paints on the gloved hands of the blindfolded participants, and instruct them to simulate the motions of handwashing. 5. After 20 seconds, ask the volunteers to stop. 6. Remove the participants' blindfolds, and ask them to show their hands to the class. Processing: 1. Ask participants to check if all parts of the volunteers' gloved hands were covered with poster paint. 2. Tell participants that if some parts are not covered, these areas represent parts of the hand that were not properly washed. 3. Tell participants the following: – Proper handwashing is important for infection prevention. – A procedure that is always performed has actually not been performed correctly.

SUPPLIES FOR HANDWASHING

- Clean water (water may be running or from a bucket, but it must be clean)
- Soap
- Soap dish that drains and keeps the soap dry
- Clean, dry towel
- Plastic container
- Alcohol, if no running water is available

Remember

- Alcohol handrubs do not remove dirt or organic material such as blood. If your hands are dirty, wash them with soap and running water.

◆ Enumerate the supplies needed for handwashing as enumerated on the slide

HANDWASHING

DO NOT USE:

- Shared towels (they are easily contaminated)
- A basin of standing water (microorganisms can multiply in standing water, even if an antiseptic is added)

◆ State what not to do or use in handwashing, as shown on the slide.

HANDWASHING

THREE KINDS OF HANDWASHING used in clinical settings.

1. Routine Handwashing (handwashing with plain soap and running water)
2. Surgical Hand Scrub (handwashing with an antiseptic and running water)
3. Alcohol Handrub

◆ State the three kinds of handwashing as presented on the slide.

ROUTINE HANDWASHING

- Handwashing with plain soap and running water
- Removes transient microorganisms and soil.
- Is appropriate in most situations when hands should be washed, including immediately after arrival at service site, before and after contact with a client, after handling specimens or potentially contaminated items, after using the toilet or latrine and before leaving service site.
- For most activities, routine hand washing for 10–15 second is sufficient. Antiseptic is not necessary.

◆ Discuss routine handwashing as shown on the slide.

Steps of Handwashing

◆ Present the steps for proper handwashing using the slides.

◆ Encourage participants to ask questions as the steps and the tips for handwashing are presented.

SURGICAL HAND SCRUB

- Handwashing with an antiseptic and running water
- **Removes transient microorganisms and soil and kills or inhibits the growth of resident microorganisms.**
- Some antiseptics continue to kill and inhibit the growth of resident microorganisms for several hours after hand are washed.

◆ Discuss surgical hand scrub as shown on the slide.

SURGICAL HAND SCRUB

When Performing Surgical Hand Scrub, Use:

- Antiseptic agents (chlorhexidine gluconate, an iodophor, or hexachlorophene).
- If antiseptics are not available, use soap and water, then rinse with an ethyl or isopropyl alcohol and glycerine solution (2 ml glycerine in 100 ml of 60%-90% alcohol) and rub hands until dry.
- A small stick or a brush for cleaning under the nails
- A soft brush, cloth, or sponge on all surfaces of the hands and forearms

◆ Discuss when to perform hand scrub as presented on the slide.

SURGICAL HAND SCRUB

How to Perform Hand Scrub:

- Put on a clean short-sleeved shirt or a scrub shirt
- Make sure fingernails are short and clean
- Begin scrubbing at the fingertips and work down to the elbow
- While washing, keep hands up above elbows
- Dry hands and forearms with a sterile towel or air-dry

◆ Discuss how to perform hand Scrub as shown on the slide.

ALCOHOL HAND-RUB

- Kills or inhibits the growth of both transient and resident microorganisms but does not remove microorganisms or soil.
- Can be used when handwashing with soap and running water is not possible or practical (such as when running water is not available).
- Rinse hands twice with 3-5 of alcohol glycerine solution (Use 100ml of 60% - 90% ethyl or isopropyl alcohol mixed with 2-3 ml glycerine) and rub hands until dry.

◆ Discuss alcohol hand rub as presented on the slide.

ALCOHOL HAND-RUB

Remember:

- Use soap or detergent when washing hands; water alone does not effectively remove protein, oil, grease and dirt.
- After handwashing, rinse hand under running water to wash away the microorganisms and soil.
- Microorganisms grow and multiply in moisture and standing water. Therefore:
  - Keep bar soap on a soap rack or in a dish that allows drainage. Leaving soap in a pool of water will lead too increased growth of microorganisms.

ALCOHOL HAND-RUB

Remember:

- Avoid dipping or washing hands in a basin containing standing water, even is an antiseptic solution is added.
- Microorganism and soil will not be washed away and the water can easily become contaminated from repeated use.
- Use small bars of soap, if available or cut large ones into smaller pieces to reduce the likelihood of contamination.
- After handwashing, dry hands with a clean towel or air dry; use individual towel or handkerchief to dry hands because shared towels can become contaminated quickly.

◆ State the different reminders for alcohol hand rub as shown on the following two slides.

GLOVES

◆ Flash the slide on Gloves.

◆ Tell participants that gloves provide a barrier against potentially infectious microorganisms in blood, other body fluids, tissues, and medical waste.

USE OF GLOVES

- Gloves provide a barrier against potentially infectious microorganisms in blood, other body fluids and medical waste, lowering the risk of transmitting infection to both health care workers and client.
- Just as hands must be washed before and after contact with each client, a separate pair of gloves must be used for each client.

◆ Tell participants why gloves should be used, and enumerate the three types of gloves.

GLOVES

Three Types:

- Sterile, surgical gloves for contact with the bloodstream or with tissue under the skin like surgical procedures.
- Non-sterile, examination gloves for contact with intact mucous membranes or for reducing the providers risk of exposure (i.e. routine pelvic examination). These gloves should be disposed after one use.
- Utility gloves for handling contaminated items, medical or chemical waste and performing housekeeping activities.

SURGICAL GLOVES

- Sterile or high level disinfected surgical gloves should be worn during vasectomy procedure.
- Disposable, sterile surgical gloves are recommended for use whenever possible because it is difficult to properly process reusable gloves.

◆ Discuss surgical gloves and their use as shown on the slide.

SINGLE USE EXAMINATION GLOVES

- These should be worn for all procedures in which there is contact with mucous membrane.
- Purpose of wearing gloves is to reduce the risk of exposing the service provider to blood or other body fluid (e.g. drawing blood, working in laboratory).
- These latex or vinyl glove are clean but not sterile.
- These gloves should be discarded after use.

◆ Discuss single-use examination gloves as presented on the slide.

UTILITY GLOVES

- These thick rubber gloves should be worn for handling contaminated instruments and other items, handling medical or hazardous chemical waste and linen, performing house-keeping activities and cleaning contaminated surfaces.
- They are reusable after cleaning.

- Discuss utility gloves as shown on the slide.

SURGICAL ATTIRE FOR VASECTOMY

- Sterile or high level disinfected gloves must be used for vasectomy.
- Cap, eye wear, mask and gown should be worn if available but vasectomy can be performed safely without wearing cap, mask and sterile gown.

- Tell participants about the required surgical attire for vasectomy as shown on the slide.

USING ANTISEPTICS

Antiseptics

- Chemicals which kill or inhibit many, though not all, microorganisms while causing little damage to tissue.
- Commonly used:
  - 70% Isopropyl alcohol
  - Iodine and iodophor solutions

- Tell participants that using antiseptics is another protective barrier against infection.
- Present this topic using the slides.

COMMON ANTISEPTICS

1. **Alcohol** (60-90% ethyl or isopropyl)
2. **Chlorhexidine gluconate with cetrimide** (Savlon®)
3. **Aqueous iodine preparations or iodine and alcohol** (e.g., tincture of iodine)
4. **Iodophors** (solutions that contain iodine in a complex form) (povidone iodine, Betadine)

Avoid use of the following:

- Mercury-containing compounds should *not* be used because they are highly toxic, cause blisters, and cause central nervous system disturbances—such as numbness, speech impairment, and deafness – or death when inhaled.
- They can also be absorbed through the skin and can cause birth defects if a pregnant woman is exposed to small doses.

- Supplement the topic by identifying other forms of antiseptics, and discuss which ones to avoid.

ALCOHOL

Alcohol (60-90% ethyl or isopropyl)

- *Antimicrobial spectrum*: good broad-spectrum activity
- *Advantages*: moderate inactivation by blood or other organic material
- *Disadvantages*: has a drying effect on skin; cannot be used on mucous membranes, not good for use as a cleaning agent; do not use on broken skin

- Discuss the features of alcohol as shown on the slide.

CHLORHEXIDINE GLUCONATE

Chlorhexidine gluconate with cetrimide (Savlon®)

- ***Antimicrobial spectrum*: good broad-spectrum activity, but minimal effect on tuberculosis and fungi**
- ***Advantages*: has good, persistent effect – i.e., remains active for at least 6 hours; activity not affected by blood or other organic material**
- ***Disadvantages*: activity can be reduced by hard water, hand creams, and natural soaps**
- ***Comments*: recommended antiseptic for surgical handscrubbing and client preparation in reproductive healthcare services, they may cause irritation if used in the genital area, vagina, or cervix.**
- ***Caution:* The concentration of chlorhexidine in products with the name Savlon may vary from one country to another. Savlon products containing at least 4% chlorhexidine are appropriate for use as antiseptics.**

- Discuss the features of chlorhexidine gluconate as shown on the slide.

AQUEOUS IODINE PREPARATIONS

Aqueous iodine preparations or iodine and alcohol (e.g., tincture of iodine)

- *Antimicrobial spectrum*: good broad-spectrum activity
- *Advantages*: fast-acting
- *Disadvantages*: can cause skin irritation; activity markedly affected by blood or other organic material
- *Comments*: too irritating for routine use in surgical handscrub or for use on mucous membranes; because of the potential to cause skin irritation, iodine must be allowed to dry, then removed from the skin with alcohol

- Discuss the features of aqueous iodine preparations as shown on the slide.

IODOPHORS

Iodophors (solutions that contain iodine in a complex form) (povidone iodine, Betadine)

- ***Antimicrobial spectrum***: good broad-spectrum activity
- ***Advantages***: less irritating than iodine, can be use on mucous membranes
- ***Disadvantages***: activity moderately affected by blood or other organic material
- ***Comments***: recommended antiseptic for surgical handscrubbing and client preparation in reproductive healthcare services; effective **1-2** minutes after application; most preparations should be used full strength – do not dilute prior to use

◆ Discuss the features of iodophors as presented on the slide.

SURGICAL SITE PREPARATION

- Clean the operative site with soap and water if the client has not already done so that day.
- Avoid shaving the client, as this increases the risk of postoperative infection. Trim hair at the operative site only if necessary.
- If shaving of the surgical site is a must:
  - 1) use antimicrobial soap and water or shave dry;
  - 2) shave immediately before the procedure, in the operating theatre or procedure room.

◆ Discuss the steps in surgical site preparation as shown on the following two slides.

SURGICAL SITE PREPARATION

- Use dry, high-level disinfected or sterile forceps to hold antiseptic-soaked cotton.
- The antiseptic should be at room temperature.
- Do not leave cotton soaking in antiseptic for prolonged periods of time or for use on multiple clients.
- Apply solution in a circular motion starting from the incision site and working outward.
- Do not permit excess antiseptic to pool underneath the client.
- After preparing the surgical site, cover the area with a sterile surgical drape.

PROCESSING OF INSTRUMENTS

◆ Introduce the topic on processing of instruments using the slide.

◆ Show the diagram for "Processing of Instruments and Other Items."

Decontamination

- Preparing 0.5% Chlorine Solution
  - Parts of water/part of chlorine

    %concentrated chlorine ____ - 1

    %desire chlorine concentration

    5 – 1 = 9 parts water/part of water

    5

    1 part chlorine in 9 parts water

◆ Tell participants that decontamination is the first step in processing instruments and other soiled items such as gloves.

◆ Tell participants how to prepare a 0.5% chlorine solution for decontamination using a prepared concentrated chlorine solution.

Decontamination

- Preparing 0.5% Chlorine Solution
  - Grams of chlorine powder or granules/ liter of water

    %desired concentration ___ x 1000

    %concentrate of granules

    5 x 1000 = .0166 x 1000 = 16.7 gms/liter

    30

    17 grams of 30% chlorine granules/powder in 1 liter of water

◆ Tell participants how to prepare a 0.5% chlorine solution for decontamination using chlorine granules/powder.

◆ Present the other steps for processing instruments and other items.

CLEANING

- Cleaning by scrubbing with detergent and water is a crucial step in processing instruments and other items.
- Cleaning greatly reduces the number of microorganisms and endospores on instruments and equipment.
- Before equipment is sterilized or high-level disinfected, a thorough mechanical cleaning is necessary to remove blood and organic material.
- High-level disinfection and sterilization are not effective unless instruments have first been cleaned.

CLEANING

Remember to:

- Wear utility gloves when cleaning instruments.
- Scrub instruments vigorously with a soft brush in detergent and water to completely remove all blood, tissue, and other residue.
- Rinse instruments thoroughly with water after scrubbing. Detergent may interfere with further processing.
- Allow items to air-dry (items to be high-level disinfected by boiling can be directly placed in the water).

◆ Discuss cleaning of instruments as shown on the next two slides.

STERILIZATION

- To be effective, sterilization *must* be preceded by careful cleaning and thorough rinsing.
- Sterilization eliminates all microorganisms (bacteria, viruses, fungi, and parasites), including bacterial endospores, from instruments and other items.
- Sterilization is the method recommended for items that come in contact with the bloodstream or tissues beneath the skin (such as reusable needles, syringes, and surgical instruments).
- Jointed instruments, such as ringed clamps and dissecting forceps, should be opened or unlocked during sterilization.
- Sterilization uses steam (autoclaving), dry heat (oven), or chemical solutions.

◆ Tell participants about sterilization as shown on the slide.

STEAM STERILIZATION

- If items are to be wrapped before steam sterilization, use two layers of paper wrap or two layers of cotton fabric (do not use canvas).
- Items or packs should be arranged to allow free circulation of steam.
- Sterilize items at 121C (250F) and 106 kPa pressure (15 lbs/in2). Use 30 minutes for wrapped items, 20 minutes for unwrapped items.

◆ Discuss steam sterilization as shown on the next two slides.

STEAM STERILIZATION

- Note: Do not begin timing until the steam sterilizer reaches the desired temperature and pressure.
- Allow packs or items to dry before removing them from the steam sterilizer.
- Allow items to cool before storage or use.
- The steam sterilizer itself should be checked with each use to make sure it is functioning properly.
- If repairs are necessary (for example, if gauges and seals are broken), repairs should be made before the machine is used for sterilization.

DRY HEAT STERILIZATION

- Items can be wrapped in foil or double-layered cotton fabric before dry-heat sterilization.
- Sterilize items at 170C (340F) for 60 minutes, 160C (320F) for 120 minutes, or at 150C for 2½ hours or at 140C for 3 hours.

◆ Discuss dry heat sterilization as shown on the next two slides.

DRY HEAT STERILIZATION

- Note: Do not begin timing until the oven reaches the desired temperature.
- Dry heat can dull sharp instruments and needles. These items should not be sterilized at temperatures higher than 160C.
- Items should be allowed to cool before they are removed from the oven.
- Items should then be used immediately or stored in a sterile covered container.

CHEMICAL STERILIZATION

- Soak items in a 2% glutaraldehyde solution (Cidex) for 8–10 hours.
- All items must be completely submerged.
- Do not add or remove any items once timing has begun.
- Rinse with sterile water (do not use boiled water; boiling does not reliably inactivate spores).
- Place instruments on a sterile surface and air-dry before use or storage.
- Use items immediately, wrap items in sterile paper or cloth, or place items in a covered sterile container.

◆ Discuss chemical sterilization as presented on the slide.

HIGH LEVEL DISINFECTION

- If sterilization is not available, high-level disinfection is the only acceptable alternative for preparing instruments for use in vasectomy.
- High-level disinfection (HLD) is effective in eliminating all microorganisms except some bacterial endospores.
- HLD should always be preceded by decontamination.
- To be effective, HLD must be preceded by careful cleaning and thorough rinsing.

HIGH LEVEL DISINFECTION

- There are three methods of HLD: boiling, steaming, and chemical HLD.
- After either HLD procedure, items that are not used immediately should be air-dried and stored in a covered, washable high-level disinfected container (for up to one week).
- Jointed instruments, such as ringed clamps and dissecting forceps, should be opened or unlocked during HLD.

◆ Discuss high-level disinfection (HLD) as shown on the next two slides.

BOILING

- Completely immerse items in water.
- Cover and boil for 20 minutes (start timing when the water begins to boil).
- All items must be completely covered during boiling (place items that float in a weighted, porous bag).
- Do not add anything to the pot after the water begins to boil.
- Place instruments on a sterile surface and air-dry before use or storage.

◆ Discuss boiling as shown on the slide.

STEAMING

- This process can be performed together with HLD by boiling or place water in the bottom tray of the steamer.
- Place gloves and instruments in the tray(s) with the holes (up to 3 trays) and stack them on top of the bottom tray.
- Place the lid on the top tray and bring the water to boil.
- When steam comes out between the trays, the water is boiling.
- Reduce the heat but maintain water at rolling boil.

◆ Discuss steaming as shown on the next two slides.

CHEMICAL HLD

- Cover all items with correct dilution of disinfectant [2% glutaraldehyde (Cidex) solution or a 0.5% chlorine solution].
- Soak items for 20 minutes or as per manufacturer's instructions.
- Nothing should be added to or removed from the chemical solution once timing has begun.
- After soaking items, rinse them with boiled water.
- Place instruments in a high-level disinfected container and air-dry before use or storage.

◆ Discuss chemical HLD as shown on the slide.

STORAGE OF PROCESSED ITEMS

- Proper storage of HLD or sterilized items is as important as the HLD or sterilization process itself.
- Items should be stored dry.
- Do not store pick-up forceps in a bottle filled with antiseptic solution (microorganisms will multiply in standing water even if an antiseptic has been added).
- HLD or sterilize used pick-up forceps each day and store them dry in a high-level disinfected or sterile bottle.

STORAGE OF PROCESSED ITEMS

- Wrapped items must be considered contaminated when:
  - The package is torn or damaged
  - The wrapping is wet
  - The expiration date is exceeded
- Wrapped items can be used for up to one week. Wrapped items sealed in plastic can be used for up to one month.
- Unwrapped items must be used immediately or stored in a covered sterile or HLD container (for up to one week).
- If possible, store processed items in an enclosed cabinet.

◆ Tell participants about storage of processed items as shown on the next two slides.

WASTE MANAGEMENT

◆ Introduce waste management by flashing the topic slide.

◆ Tell participants the following:

- In the provision of health care services, such as FP and maternal care, wastes are generated.
- Poor management of waste exposes health care workers, waste handlers, and the community to infections, toxic effects, and injuries.

PURPOSE OF WASTE MANAGEMENT

- Prevents the spread of infections to clinic personnel, clients, visitors and the community.
- Reduces the risk of accidental injury to staff, clients, and community.
- Reduces bad odors.
- Attracts fewer insects and animals which may be vectors of infectious agents.
- Reduces the possibility of the soil or ground water contamination with chemicals or microorganism

◆ State the purpose for proper waste management as presented on the slide.

KINDS OF WASTE

GENERAL WASTES

- non-hazardous waste that poses no risk of injury or infections similar to household trash.

HAZARDOUS MEDICAL WASTES

- these are wastes that can cause injuries or are potentially infectious

◆ Present the kinds of wastes as written on the slide.

HAZARDOUS MEDICAL WASTES

Infectious - these contain pathogens in sufficient concentration to cause diseases

Pathological - consist of human tissues or fluids

Pharmaceutical - expired, unused, and contaminated pharmaceutical products, drugs, vaccines

Chemicals - these are discarded solid, liquid, and gaseous chemicals used in cleaning, housekeeping, and disinfecting procedures.

Sharps - items that could cause cuts and puncture wounds

Pressurized containers - full or emptied aerosol cans with pressurized liquid gas or powdered materials

◆ Explain the types of hazardous medical wastes generated as shown on the slide.

MAINTAINING A SAFE ENVIRONMENT IN THE VASECTOMY PROCEDURE ROOM

- Limit entry of unauthorized individuals to surgical room.
- Close doors and curtains during the procedure.
- Each day, clean the floor with a damp mop (water only) and wipe counters and table tops with a damp rag (water only) before any procedures begin.
- After each case, wipe down the procedure table, the floor around the table, the instrument stands, and other potentially contaminated areas (such as light switches and counter tops) with a 0.5% chlorine solution.

◆ Discuss additional features of maintaining a safe environment in the vasectomy procedure room.

HANDLING SHARPS

- In health care settings, injuries from needles and other sharp items are the most common cause of infections from blood-borne pathogens.
- It is important therefore that sharps are handled with care and to dispose them properly after use.

HANDLING SHARPS

Instances when health care providers can be injured by sharps:

- When health care workers recap, bend, or break hypodermic needles.
- When health care workers are stuck by a person carrying unprotected sharps
- When sharps show up in unexpected places, like between linens

HANDLING SHARPS

Instances when health care providers can be injured by sharps:

- During procedures in which they use many sharps, cannot see their hands, or are working in a small, confined space (like during gynecologic procedures)
- When health care providers handle and dispose of waste that contains used sharps.
- When clients move suddenly during injections

◆ Discuss how to handle sharps as shown on the next three slides.

GIVING INJECTIONS

To prevent injuries when giving injections, the following recommendations are considered:

- **Always warn the client before giving an injection**
- **Always use new or properly processed needle and syringe for every injection.**

◆ Tell participants how to give injections as shown on the next two slides.

GIVING INJECTIONS

Steps for giving injections:

- Wash injection site with soap and water if the area is visibly dirty
- Swab the area with antiseptic (alcohol solution) in circular motion starting from the intended injection site going outward.
- Allow the alcohol to dry for better efficacy.
- Inform client that you are about to inject

RECAPPING NEEDLES

- Whenever possible, dispose of needles immediately without recapping them.
- But if recapping is necessary, follow the "one hand technique"
  1. Place the cap on a flat surface and remove hand from the cap
  2. With one hand, hold the syringe and use the needle to scoop up the cup.
  3. When the cap covers the needle completely, use the other hand to secure the cap on the needle hub. Be careful to hold the cap at the bottom only (near the hub).

◆ Tell participants about the guidelines on recapping needles as shown on the slide.

Process of Waste Disposal

1. Sorting or segregation and containerization
2. Handling
3. Interim Storage
4. Final Disposal

◆ Enumerate the four aspects of processing instruments and other items.

Sorting and Containerization

- Categorizing wastes at the point of generation
- Reduces the amount of wastes that need special handling
- Segregation
  - Black container: general, dry, non-infectious waste
  - Green container: general, wet, non-infectious waste
  - Yellow container: infectious, pathologic waste
  - Sharp, puncture proof container with lid: needles, blades

◆ Explain each aspect of waste disposal using the presentation slides.

Handling

- Handle medical waste as little as possible before disposal.
- When waste containers are ¾ full, close plastic containers and place in larger containers at interim storage areas.
- ALWAYS wear heavy, utility gloves when handling medical waste.
- ALWAYS wash hands after handling waste and after removing gloves.

Interim Storage

- Storing of waste in the facility prior to collection.
- Interim storage should not be more than 2 days.
- Place waste in an area that is minimally accessible to clinic staff, clients, and visitors.
- Ensure that wastes are collected regularly, ideally on a daily basis.

Final Disposal

- General wastes
  - Collected by the municipal garbage collector and transported to the final dump sites.
- Solid Medical Wastes
  - Burying in a space at the back of the facility in a pit.
  - Transporting waste to an off-site disposal site done by the waste collector of hospital medical wastes.

Final Disposal

- Liquid Medical Wastes
  - Pour liquid waste down a sink, drain or flushable toilet.
  - Drains should not run through open gutters.
  - Rinse the sink or toilet thoroughly with disinfectant.
  - Decontaminate container and wash hands before removing gloves.
- Sharps
  - Use sharps puncture proof containers.
  - Dispose of sharps containers when ¾ full.
  - Burial is the safest way to dispose of sharps.

Important Points

- Wear utility gloves
- Transport solid contaminated waste in covered containers
- Dispose of all sharp items in puncture-resistant containers
- Carefully pour liquid waste down a utility drain or flushable toilet
- Decontaminate gloves and containers before cleaning
- Wash hands after handling infectious waste

Use of Multidose Vials

- Check the vial to be sure there are no leaks or cracks.
- Check the solution to be sure that it is not cloudy and no particulate matter.
- Wipe the top of the vial with a cotton swab soaked with 60-70% alcohol. Allow to dry.
- Use a new needle and syringe for each new person.
  - Never use a contaminated needle or syringe that has been used previously.
- Do not leave needles in multiple dose vials.

◆ Explain how to use multi-dose vials using the presentation slide.

WASTE MANAGEMENT ACTION PLANNING

◆ Ask participants to write on meta-cards the kinds of wastes they are generating from their maternal care and FP practice.

◆ Arrange the meta-cards by removing duplications, then group them according to types of waste.

◆ Each participant then develops a work plan using the matrix shown on the next slide.

MATRIX ON ACTION PLANNING FOR WASTE MANAGEMENT

Waste Generated	Frequency of Collection	Type of Storage	Method of Disposal	Responsible Person

◆ Present the matrix for waste management action planning.

KEY MESSAGES

- To create an infection-free environment, it is important that the rationale for each of the recommended infection prevention processes (and its limitations) be clearly understood by clinic staff at all levels—from service providers to cleaning and maintenance staff.
- Because it is not possible to know in advance if a client is infected with hepatitis B or HIV, all items from all clients must be handled as if they were contaminated. All clients must be treated as if they were infected.

◆ Give the key messages in closing the module.

NARRATIVE

IMPORTANCE OF INFECTION PREVENTION

Without proper precautions, health facilities can cause the spread of infections and diseases. When providing health services, the transmission of infections must be prevented at all times. Over the past few decades, the world has seen increased outbreaks of diseases that were once better controlled. Moreover, previously unidentified infectious agents that can cause incurable diseases, such as HIV and hepatitis C, have become a significant cause of illness and death in many parts of the world.

Although we do not often think about this issue, health care facilities are ideal settings for transmission of disease because of the following reasons:

◆ Invasive procedures, which have the potential to introduce microorganisms into parts of the body where they can cause infections, are performed routinely.

◆ Service providers and other staff are constantly exposed to potentially infectious materials as part of their work.

◆ Many people seeking health care services are already sick and may be more susceptible to infections.

◆ Some of the people seeking services have infections that can be transmitted to others.

◆ Services are sometimes provided to many clients in a limited physical space, often within a short period.

With appropriate infection prevention practices, the following can be achieved:

◆ Prevent postprocedure infection, including surgical-site infections

◆ Provide high-quality, safe services

◆ Prevent infections in service providers and other staff

◆ Protect the community from infections that originate in health care facilities

◆ Prevent the spread of antibiotic-resistant microorganisms

◆ Reduce the costs of health care services because prevention is cheaper than treatment

Infection prevention practices protect not only clients but also clinic staff and the community. We must remember that all clinic staff who have contact with blood and body fluids—from the physicians to the cleaners—are at risk of infection. Most infections can be prevented if infection prevention procedures are followed.

HOW INFECTIONS ARE TRANSMITTED

Infections are caused by microorganisms. Microorganisms are everywhere—on the skin, in the air, and in people, animals, plants, soil, and water.

Some microorganisms are normally present on the skin and the respiratory, intestinal, and genital tracts. These microorganisms are called normal flora. Other microorganisms are normally not found on or in the human body and are usually associated with disease. These microorganisms are known as pathogens. All microorganisms, including normal flora, can cause infection or disease.

Infections are transmitted when normal flora are introduced into an area of the body where they are not normally found or when pathogens are introduced into the body. The infectious agent survives, grows, and/or multiplies in the reservoir and then leaves the reservoir through a place of exit by a mode of transmission. The infectious agent then enters the susceptible host through a place of entry. The components of the disease transmission cycle are shown in Figure 5–1 and are discussed as follows:

- Infectious agent: Microorganisms that can cause infection or disease. The infectious agent can be bacteria, viruses, fungi, or parasites.
- Reservoir: The place where the agent survives grows and/or multiplies. People, animal, plants, soil, air, water, solution, instruments, and other items used in clinic procedure can serve as reservoirs for potentially infectious microorganisms.
- Place of exit: The route by which the infectious agent leaves the reservoir. The infectious agent can leave the reservoir through the blood stream, broken skin, mucous membrane, gastrointestinal tract, or placenta by means of blood, excretion, secretion, or droplets that come from other places.
- Mode of transmission: Infections are transmitted in four ways:
  - Contact: Direct transfer of microorganisms through touch (staphylococcus), sexual intercourse (gonorrhea, HIV), fecal/oral transmission (hepatitis A, shigella), or droplets (Influenza, TB)
  - Vehicle: Material that serves as a means of transfer of the microorganisms. The vehicle can be food (salmonella), blood (HIV, HBV), water (cholera, shigella), or instruments and other items used during clinical procedures (HBV, HIV, pseudomonas).
  - Airborne: Some microorganisms can be carried by air currents (measles, TB).
  - Vector: Invertebrate animals can transmit the microorganisms (mosquito: malaria and yellow fever; flea: plague).
- Place of entry: The route through which the infectious agent moves into the susceptible host. The infectious agent can enter the susceptible host through the blood stream, broken skin, mucous membranes, respiratory tract, genitourinary tract, and gastrointestinal tract.
- Susceptible host: A person who can become infected by the infectious agent. For the purpose of this training, the susceptible host includes clients, service providers, and members of the community.

We must remember that the mode of transmission is the easiest point at which to break the disease– transmission cycle in a health care facility. This goal can be accomplished by following appropriate infection prevention practices, such as handwashing, practicing correct aseptic techniques, correctly processing instruments and other items for reuse, and correctly disposing medical waste.

Figure 5–1. Disease Transmission Cycle

RISKS OF INFECTION

Infection prevention is everybody's business. Just as everyone who works at a health care facility is at risk of infection, every health care worker has a role to play in practicing appropriate infection prevention. For infection prevention to be effective, each staff member must do his or her part.

Infection transmission can be transmitted among clients, staff, and the community as follows:

Risk to Staff

Service providers are at significant risk of infection because they are exposed to potentially infectious blood and other body fluids on a daily basis. Staff members who process instruments and other items, clean up after procedures, clean operating theaters and procedure rooms, and dispose waste are particularly at risk. Client–to–health care worker transmission can occur through exposure to infectious blood and other body fluids. This exposure can occur in the following instances:

- When a health care worker's skin is pierced or cut by contaminated needles or sharp instruments
- When fluids are splashed on the mucous membranes of the health care worker (e.g., eyes, nose, or mouth)
- Through broken skin attributed to cuts, scratches, rashes, acne, chapped skin, or fungal infections

Risk to Clients

Clients are at risk of postprocedure infection when, for example, service providers do not wash their hands between clients and procedures, when they do not adequately prepare clients before a clinical procedure, and when used instruments and other items are not cleaned and processed correctly.

Risks to the Community

The community is also at risk of infection in the following instances:

- Medical waste, including contaminated dressings, tissue, needles, syringes, and sharps (needles and scalpel blades), is improperly discarded.
- Health care workers do not wash their hands before leaving the facility and then touch family members or household items.
- Health care workers wear contaminated clothing from the facility to their home. Some infections can be spread by the staff to their family members or others in the community.

POTENTIAL INFECTIONS ASSOCIATED WITH VASECTOMY

Some of the more serious infections that could be associated with vasectomy are tetanus, gangrene, scrotal sepsis, intra-abdominal sepsis, HIV infection, and HBV infection.

Stopping Transmission of Infections

As health professionals, we cannot provide health care services without conducting procedures that put clients and staff at some risk of exposure to potentially infectious materials, but we can prevent transmission in many cases. The only way to prevent infections is to stop the transmission of microorganisms.

Standard precautions are based on the assumption that every person in the facility is potentially infectious. As many people with blood-borne viral infections (e.g., hepatitis B [HBV] or C [HCV], HIV) do not feel or look ill, we must consistently apply standard precautions regardless of the (known or unknown) health status of those who are providing or receiving care.

When applied consistently, standard precautions act as protective barriers between microorganisms and individuals and are considered as a highly effective means of preventing the spread of infection.

The following actions help to form such barriers, as well as provide the means for implementing the standard precautions:

- Washing of hands is the most important procedure for preventing cross-contamination (person to person or contaminated object to person).
- Wear gloves (on both hands) before touching anything, e.g., wet broken skin, mucous membranes, blood or other body fluids (secretions and excretions), soiled instruments, and contaminated waste materials, and before performing invasive procedures.
- Use physical barriers (protective goggles, face masks, and aprons) if splashes and spills of blood or other body fluids are possible (e.g., when cleaning instruments and other items).
- Use antiseptic agents for cleansing skin or mucous membranes before surgery, cleaning wounds, or for hand rubs or surgical hand scrubs with an alcohol-based antiseptic product.
- Use safe work practices such as not recapping or bending needles, safely passing sharp instruments, and suturing (when appropriate) with blunt needles.
- Process instruments, gloves, and other items after use by first decontaminating and thoroughly cleaning them and then either sterilizing or high-level disinfecting them using recommended procedures. Again, in the context of IUD services, HLD is the recommended method of final processing.
- Safely dispose infectious waste materials to protect those who handle them and prevent injury or spread of infection to the community.

Wash Hands

Handwashing is one of the most important infection prevention measures.

When to Wash Hands:

- Immediately after arrival at work
- Before examining a client
- After examining a client
- Before putting on gloves for clinical procedures
- After touching any object that might be contaminated with blood or other body fluids
- After removing gloves (gloves may contain small holes or tears)
- After using the toilet or latrine
- Before leaving work at the end of the day

Things to Use When Washing:

- Regular soap; antimicrobial soap can be used, but is not necessary for routine handwashing.
- Running water
- Clean towel

Do Not Use:

- Shared towels (can easily be contaminated)
- A basin of standing water; microorganisms can multiply in standing water, even if an antiseptic is added.

Three Kinds of Handwashing

Three kinds of handwashing are used in clinical settings.

1. Routine Handwashing (handwashing with plain soap and running water; Figure 5–2)
   - Removes transient microorganisms and soil.
   - Is appropriate in most situations when hands should be washed, including immediately after arrival at service site, before and after contact with a client, after handling specimens or potentially contaminated items, after using the toilet or latrine, and before leaving service site.
   - For most activities, routine handwashing for 10 to 15 seconds is sufficient. Antiseptic is not necessary.
2. Surgical Hand Scrub (handwashing with an antiseptic and running water)
   - Removes transient microorganisms and soil and kills or inhibits the growth of resident microorganisms. Some antiseptics continue to kill and inhibit the growth of resident microorganisms for several hours after hands are washed.

When performing surgical hand scrub, use the following:

- Antiseptic agents (chlorhexidine gluconate, an iodophor, or hexachlorophene). If antiseptics are unavailable, use soap and water, then rinse with an ethyl or isopropyl alcohol and glycerine solution (2 mL glycerine in 100 mL of 60% to 90% alcohol); rub hands until dry.
- A small stick or a brush for cleaning under the nails.
- A soft brush, cloth, or sponge on all surfaces of the hands and forearms.

Perform hand scrub in the following instances:

- Before NSV
- Between each NSV

In high-volume settings, skin may become irritated from frequent scrubbing. To prevent skin irritation while reducing the number of microorganisms on the hands, use 3 mL to 5 mL of alcohol-glycerine solution between clients, then scrub every hour or after every four clients (whichever comes first).

The following are the steps in performing a hand scrub:

a. Put on a clean short-sleeved shirt or a scrub shirt.

b. Ensure that fingernails are short and clean.

c. Begin scrubbing at the fingertips and work down to the elbow.

d. While washing, keep hands up above elbows.

e. Dry hands and forearms with a sterile towel or air-dry.

Figure 5–2. Routine Handwashing

3. Alcohol Hand Rub
   - Kills or inhibits the growth of both transient and resident microorganisms but does not remove microorganisms or soil.
   - Can be used when handwashing with soap and when running water is not possible or practical (such as when running water is not available).
   - Rinse hands twice with 3% to 5% alcohol glycerine solution (use 100 mL of 60% to 90% ethyl or isopropyl alcohol mixed with 2 mL to 3 mL glycerine); rub hands until dry.

Remember to use soap or detergent when washing hands; water alone does not effectively remove protein, oil, grease, and dirt. After handwashing, rinse hand under running water to wash away microorganisms and soil.

Microorganisms grow and multiply in moisture and standing water. Therefore,

- Keep bar soap on a soap rack or in a dish that allows drainage. Leaving soap in a pool of water will result in the increased growth of microorganisms.
- Avoid dipping or washing hands in a basin containing standing water, even if an antiseptic solution is added. Microorganisms and soil will not be washed away, and the water can easily become contaminated from repeated use.
- Use small bars of soap, if available, or cut large ones into small pieces to reduce the likelihood of contamination.
- After handwashing, dry hands with a clean towel or air-dry; use an individual towel or handkerchief to dry hands because shared towels can become contaminated quickly.

Use of Gloves

Gloves provide a barrier against potentially infectious microorganisms in blood, other body fluids, and medical waste, thus lowering the risk of transmitting infection to both health care workers and clients. Just as hands must be washed before and after contact with each client, a separate pair of gloves must be used for each client.

Three Kinds of Gloves

Gloves come in three kinds:

1. Surgical gloves
   - Sterile or high-level disinfected surgical gloves should be worn during the vasectomy procedure.
   - Disposable, sterile surgical gloves are recommended for use whenever possible because of the difficulty in properly processing reusable gloves.

2. Single-use examination gloves
   - These gloves should be worn for all procedures in which contact with mucous membrane occurs. The purpose of wearing gloves is to reduce the risk of exposing the service provider to blood or other body fluids (such as when drawing blood or working in a laboratory).
   - These latex or vinyl gloves are clean but not sterile.
   - These gloves should be discarded after use.

3. Utility gloves
   - These thick rubber gloves should be worn for handling contaminated instruments and other items, handling medical or hazardous chemical wastes and linen, performing housekeeping activities, and cleaning contaminated surfaces.
   - These gloves are reusable after cleaning.

How to Wear Surgical Gloves

Prior to putting on gloves, the vasectomist and his or her assistant must thoroughly scrub their hands with soap and water or antiseptic agents, such as hexachlorophene, chlorhexidine, gluconate, or an iodophor. A small stick or a brush should be used to clean under the fingernails, and a soft brush, cloth, or sponge should be used on all surfaces of the hands and forearms. For facilities where surgical scrubbing is accomplished with soap and water only, ethyl alcohol and glycerin rinse (2 mL glycerin in 100 mL alcohol) should then be used, rubbing the hands together until dry.

Ideally, the vasectomist and his or her assistant should scrub thoroughly between procedures. In high-volume settings, this practice may not be feasible because the skin cannot tolerate the irritation caused by frequent scrubbing. In such settings, surgical staff should do a three-minute scrub every hour or after every four or five cases (whichever comes first) to prevent recolonization of the skin by microorganisms. Using 3 mL to 5 mL of the alcohol-glycerin mixture and rubbing the hands together until dry is an effective way of reducing the number of bacteria on the hands between every case. Gloves must be changed between cases and when they are torn. Staff should wash their hands after removing their torn gloves.

Figure 5-3 illustrates the steps for wearing surgical gloves, whereas Figure 5-4 shows the procedure for removing gloves.

Figure 5-3. Steps for Wearing Surgical Gloves

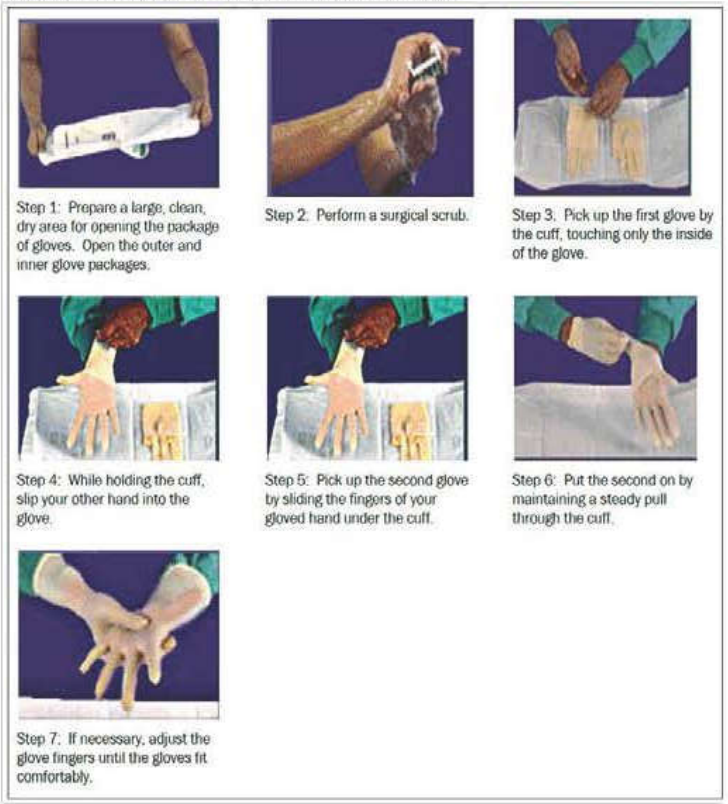
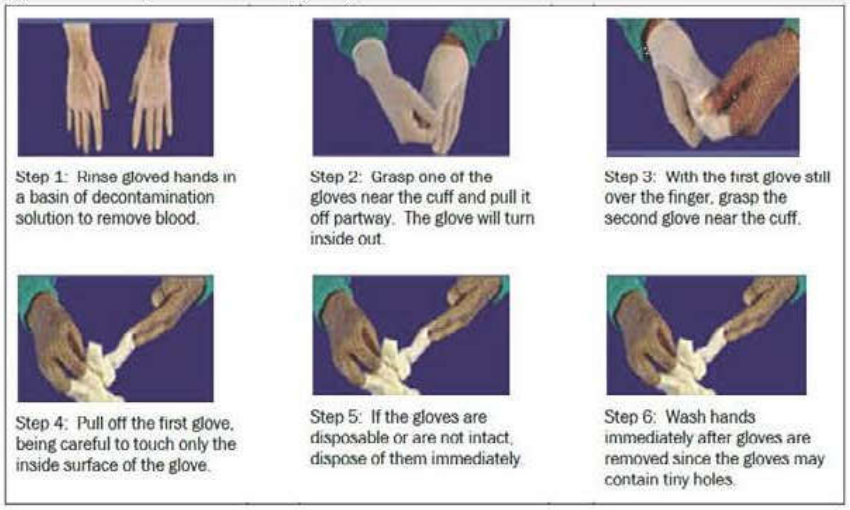


Figure 5–4 Steps for Removing Surgical Gloves



Remember the following:

- As you remove the gloves, avoid allowing the outside surface of gloves to come in contact with your skin because the outer surface will have been contaminated with blood and other body fluids.
- Remove used gloves before touching anything. Countertops, pens, and pencils are frequently contaminated because health care workers touch them while wearing used gloves.

Surgical Attire for Vasectomy

- Sterile or high-level disinfected gloves must be used for vasectomy.
- Cap, eye wear, mask, and gown should be worn, if available, but vasectomy can be performed safely without wearing a cap, mask, and sterile gown.

Proper Use of Antiseptics and Disinfectants

Antiseptics vs. Disinfectants

Antiseptics are chemical agents used to reduce the number of microorganisms on skin and mucous membranes without causing damage or irritation. In addition to removing or killing microorganisms, antiseptics may also prevent the growth and development of microorganisms, depending on the type of antiseptic and microorganism. Antiseptics are not meant to be used on inanimate objects, such as instruments and surfaces. In addition, items such as pickup forceps, scissors, scalpel blades, and suture needles should never be left soaking in an antiseptic solution.

Disinfectants are chemical agents used to kill microorganisms on inanimate objects, such as instruments and surfaces. Disinfectants are not meant to be used on skin or mucous membranes.

Antiseptics

Antiseptics are used for the following:

- Surgical hand scrub

- Skin, cervical, or vaginal preparation prior to a clinical procedure
- Handwashing in high-risk situations, such as prior to an invasive procedure or contact with a client with high risk of infection (e.g., newborns or immunosuppressed clients)

The following are some common antiseptics:

1. Alcohol (60% to 90% ethyl or isopropyl)
   - *Antimicrobial spectrum:* good broad-spectrum activity
   - *Advantages:* moderate inactivation by blood or other organic material
   - *Disadvantages:* has a drying effect on skin; cannot be used on mucous membranes; not good for use as a cleaning agent; not for use on broken skin

2. Chlorhexidine gluconate with cetrimide (Savlon®)
   - *Antimicrobial spectrum:* good broad-spectrum activity but minimal effect on tuberculosis and fungi
   - *Advantages:* has good, persistent effect, i.e., remains active for at least six hours; activity not affected by blood or other organic material
   - *Disadvantages:* activity can be reduced by hard water, hand creams, and natural soaps
   - *Comments:* recommended antiseptic for surgical hand scrubbing and client preparation in reproductive healthcare services; may cause irritation if used in the genital area, vagina, or cervix.
   - *Caution:* The concentration of chlorhexidine in products with the name Savlon may vary from one country to another. Savlon products containing at least 4% chlorhexidine are appropriate for use as antiseptics.

3. Aqueous iodine preparations or iodine and alcohol (e.g., tincture of iodine)
   - *Antimicrobial spectrum:* good broad-spectrum activity
   - *Advantages:* fast-acting
   - *Disadvantages:* can cause skin irritation; activity markedly affected by blood or other organic material
   - *Comments:* too irritating for routine use in surgical hand scrub or for use on mucous membranes; must be allowed to dry then removed from the skin without alcohol because of the potential to cause skin irritation

4. Iodophors (solutions that contain iodine in a complex form; povidone iodine, Betadine®)
   - *Antimicrobial spectrum:* good broad-spectrum activity
   - *Advantages:* less irritating than iodine; can be used on mucous membranes
   - *Disadvantages:* activity moderately affected by blood or other organic materials
   - *Comments:* recommended antiseptic for surgical hand scrubbing and client preparation in reproductive health care services; effective 1 minute to 2 minutes after application; use of full strength for most preparations; not to be diluted prior to use

Note that mercury-containing compounds should NOT be used because they are highly toxic, cause blisters, and cause central nervous system disturbances, such as numbness, speech impairment, and deafness, or death when inhaled. Such compounds can also be absorbed through the skin and can cause birth defects if a pregnant woman is exposed to small doses.

Table 5-1 presents a comparison of the efficacy of commonly used antiseptics that can be used for NSV.

Table 5-1. Antiseptics for Use in NSV

ANTISEPTIC	USE			COMMENTS
	Surgical Hand Scrub	Skin reparations	Mucous embranes	
Alcohols (60% to 90% ethyl or isopropyl)	yes	yes	no	Must dry completely to be effective
Chlorhexidine gluconate* (4%) (Hibitane, Hibiscrub)	yes	yes	yes	Has good persistent effect
Hexachlorophene (3%) (pHisoHex)	yes	no	no	Rebound growth of bacteria may occur.
Aqueous iodine preparations (3%) or iodine and alcohol	no	yes	no	Allow to dry, then remove with alcohol.
Iodophors* (I:2,500) (Betadine)	yes	yes	yes	Effective 1 minute to 2 minutes after application
Chlorhexidine with cetrimide (4%) (Savlon)	yes	yes	yes	Do not use to store instruments or other items.
Alcohols (60 to 90% ethyl or isopropyl)	yes	yes	no	Must dry completely to be effective
Chlorhexidine gluconate* (4%) (Hibitane, Hibiscrub)	yes	yes	yes	Has good persistent effect

* These agents are recommended for use in surgical scrubs and as client prep solutions before NSV. Iodophors (e.g., Betadine should be the first choice if available.)

ADAPTED FROM: World Federation of Health Agencies for the Advancement of Voluntary Surgical Contraception, 1995, *Safe and Voluntary Surgical Contraception*, New York: AVSC International.

Disinfectants

1. High-level disinfectants – kill almost all bacteria, viruses, and fungi, except bacterial endospores that cause gangrene and tetanus. Some high-level disinfectants are also chemical sterilants and will destroy endospores given sufficient time. Examples include Cidex® and chlorine solution.

High-level disinfectants are used for the following:

- Processing instruments and other items that come in contact with broken skin or intact mucous membranes
- When sterilization is unavailable, used for processing instruments and other items that come in contact with the bloodstream or tissues under the skin

Only two solutions are available in most low-resource settings that are suitable for the high-level disinfection of instruments and other items:

a. Chlorine Solution

- Cheapest effective disinfectant
- Fast-acting and effective against a broad range of microorganisms
- Usually used in concentrations of 0.5% solution
- Can be used for decontamination (10 minutes) and HLD (20 minutes) of instruments and other items, as well as disinfection of surfaces
- Available in liquid (sodium hypochlorite), powder (calcium hypochlorite), and tablet (sodium dichloroisocyanurate) form

Precautions:

- Can be corrosive to metals with prolonged contact (more than 20 minutes) and irritating to the skin, eyes, and respiratory tract
- Should be changed daily or more frequently because potency can be lost rapidly over time or after exposure to sunlight.
- Must be discarded after 24 hours

b. Glutaraldehyde - Cidex®

- The most commonly used disinfectant for processing medical equipment such as laparoscopes, which cannot be heat sterilized
- Dilution varies; follow manufacturer's instructions for dilution.
- Can be used for HLD by soaking for 20 minutes or for sterilization by soaking for 10 hours (follow manufacturer's instructions)
- Not corrosive to instruments and other items

Precautions:

- Leaves a residue, so instruments and other items must be rinsed thoroughly with boiled water after HLD and with sterile water after sterilization.
- Solution should be changed every 14 or 28 days (may vary depending on product; follow manufacturer's instructions). The solution should be changed even before the recommended time if cloudy or visibly dirty.
- Irritating to the skin, eyes, and respiratory tract. Wear gloves, prepare in a well-ventilated space, and limit exposure to the chemical when handling glutaraldehyde.

2. Low-level disinfectants – kill most bacteria and some viruses and fungi but do not kill tuberculosis-causing organisms and bacterial endospores, which cause such diseases as tetanus and gangrene. Examples of these are Phenyl and Lysol.

Low-level disinfectants are used to clean surfaces (such as floors and countertops). They should not be used to process instruments and other items.

Low-level disinfectants, such as phenols or carbolic acid (Phenol®, Lysol®), and quaternary ammonium compounds, such as benzalkonium chloride (Zephiran®), are suitable for use in disinfecting walls, floors, and furnishings. However, most products have few (if any) advantages over using chlorine/detergent solutions, which are less expensive and often more readily available. These low-level disinfectants should be used when chlorine compounds are unavailable.

Remember that disinfectants are harsh chemicals that can damage tissues; they kill a broader range of microorganisms more effectively than antiseptics. Considering the potential for tissue damage, disinfectants should never be used on skin or mucous membranes.

Protecting Antiseptics and Disinfectants from Contamination

Although antiseptics and disinfectants are effective in killing microorganisms, their abilities are limited. As a result, antiseptics and disinfectants can easily become contaminated. Using contaminated antiseptics and disinfectants can cause infections.

Antiseptics and disinfectants can become contaminated when:

- Left for several days in an open container for repeated use
- Water used to dilute the solution is contaminated
- Containers in which antiseptics or disinfectants are placed are contaminated
- Microorganisms from the provider's skin or a contaminated instrument or other items come in contact with the solutions during use, such as when removing cotton balls from a solution for skin preparation
- The area where solutions are prepared or used is unclean

To prevent contamination, perform the following:

- Pour solutions into smaller containers for use during service delivery to avoid contaminating the stock container.
- Pour the amount of antiseptic needed for one client into a small bowl prior to the start of the procedure. Discard any remaining solution at the end of the procedure.
- Avoid soaking gauze, cotton wool, or cotton balls in solutions.
- Always pour solutions out of the container without touching the rim or the solution itself with your hand, a cotton swab, or gauze because the entire bottle of solution can be contaminated in such cases.
- Store antiseptics and disinfectants in a cool, dark area. Avoid storing antiseptics and disinfectants in direct sunlight or in excessive heat, as this may reduce their strength.

SURGICAL SITE PREPARATION

- Clean the operative site with soap and water if the client has not already done so that day.
- Trim hair at the operative site, if necessary. Avoid shaving the client, as this increases the risk of postoperative infection.
- If shaving of the surgical site is a must,
  - use antimicrobial soap and water or shave dry or
  - shave immediately before the procedure in the operating theatre or in the procedure room.
- Use dry, high-level disinfected or sterile forceps to hold antiseptic-soaked cotton. The antiseptic should be at room temperature. Do not leave cotton soaking in antiseptic for prolonged periods of time or for use on multiple clients.
- Apply solution in a circular motion starting from the incision site and working outward.
- Do not permit excess antiseptic to pool underneath the client.
- After preparing the surgical site, cover the area with a sterile surgical drape.

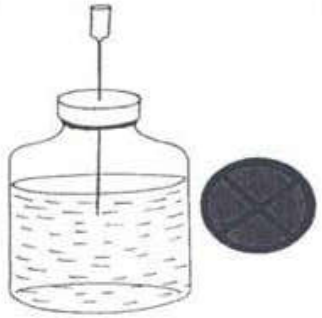
USING SAFE WORK PRACTICES

Multidose Vials

Local anesthetic is often available in multidose vials. If used incorrectly, these vials can be a source of cross-infection between clients.

- Never use a needle that has been used on a client to draw up solution from a multidose vial (unless the entire contents of vial will be used on the same client).
- Changing the needle but using the same syringe is not a safe practice.
- Do not leave a needle in a multidose vial between uses.

Figure 5-5. Multidose Vial – do not leave needle in the rubber stopper of the vial



Maintaining a Safe Environment in the Vasectomy Procedure Room

- Limit entry of unauthorized individuals to surgical room.
- Close doors and curtains during the procedure.
- Each day, clean the floor with a damp mop (water only) and wipe counters and table tops with a damp rag (water only) before any procedures begin.
- After each case, wipe down the procedure table, the floor around the table, the instrument stands, and other potentially contaminated areas (such as light switches and counter tops) with 0.5% chlorine solution.
- At the end of the day, repeat the above procedure with a disinfectant cleaning solution that contains both a disinfectant (chlorine) and a detergent (soap).
- Thoroughly clean the procedure room at least once a week. Use a disinfectant cleaning solution to scrub the walls, floors, and equipment. Wash from the top to bottom so that debris that falls on the floor will be cleaned up last.

Handling Sharps

In health care settings, injuries from needles and other sharp items are the most common cause of infections from blood-borne pathogens. Therefore, sharps must be handled with care and disposed properly after use. Below is the list of instances when health care providers can be injured by sharps:

- When health care workers recap, bend, or break hypodermic needles
- When health care workers are struck by a person carrying unprotected sharps
- When sharps show up in unexpected places, such as between linens
- During procedures in which health care workers use many sharps, cannot see their hands, or are working in a small, confined space (such as during gynecologic procedures)
- When health care providers handle and dispose waste that contains used sharps
- When clients move suddenly during injections

Giving Injections

- To prevent injuries when giving injections, the following recommendations are considered:
- Always warn the client before giving an injection.
- Always use new or properly processed needle and syringe for every injection.
- Follow the following steps for giving injections:
  a. Wash injection site with soap and water if the area is visibly dirty.
  b. Swab the area with antiseptic (alcohol solution) in circular motion starting from the intended injection site going outward.
  c. Allow the alcohol to dry for better efficacy.
  d. Inform client that you are about to inject.

Recapping Needles

- Whenever possible, dispose needles immediately without recapping them
- If recapping is necessary, follow the "one-hand technique."
  a. Place the cap on a flat surface and remove hand from the cap.
  b. With one hand, hold the syringe and use the needle to scoop up the cup.
  c. When the cap covers the needle completely, use the other hand to secure the cap on the needle hub. Be careful to hold the cap at the bottom only (near the hub).

Processing of Instruments and Other Items Used in Vasectomy

The pages that follow give detailed information on the three steps for processing instruments and reusable supplies used in NSV.

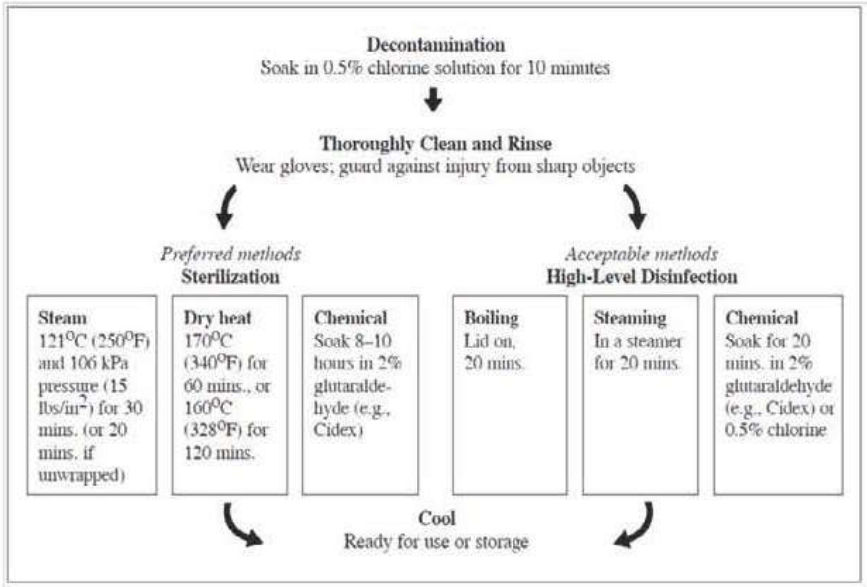
Step 1. **Decontamination.** Reduces the risk of hepatitis B (HBV) and HIV transmission to staff and makes instruments and supplies safer for handling during cleaning.

Step 2. **Cleaning.** Cleaning with detergent and water removes blood and tissue and improves the quality of subsequent HLD or sterilization.

Step 3. **Sterilization.** Sterilization using dry heat, steam, or chemical solutions destroys all microorganisms, including endospores.
OR
HLD. HLD through boiling or using chemicals destroys all microorganisms, with the exception of some endospores.

Step 4. **Storage of processed items.** Proper storage of processed items maintains sterility/disinfection until it is ready for use.

Figure 5-6. Steps of Instrument Processing



ADAPTED FROM: Tietjen, L., Cronin, W., and McIntosh N. 1992. *Infection Prevention for Family Planning Service Programs*, A Problem-Solving Reference Manual. Durant, OK: Essential Medical Information Systems, Inc.

Step 1: Decontamination

The first step in handling dirty instruments, decontamination using a 0.5% chlorine solution, reduces the risk of HBV and HIV infection. Chlorine rapidly inactivates both HBV and HIV, making the instruments safer for staff to handle during cleaning.

Note: Wear utility gloves when handling chlorine, used surgical instruments, and other items for decontamination.

a. Immediately after use, decontaminate surgical instruments, reusable gloves, and other items by placing them in a plastic bucket containing a solution of 0.5% chlorine for 10 minutes. A bucket containing this solution should be kept in the procedure room so that used items can be placed directly into the bucket.
b. After 10 minutes, remove items from the chlorine solution and rinse with water or clean immediately. Excessive soaking in the solution can damage instruments.
c. Prepare a new chlorine solution at the beginning of each day.

Figure 5–7. Preparing a 0.5% Chlorine Solution

Step 2: Cleaning

Cleaning by scrubbing with detergent and water is a crucial step in processing instruments and other items. Cleaning significantly reduces the number of microorganisms and endospores on instruments and equipment.

Before equipment is sterilized or high-level disinfected, a thorough mechanical cleaning is necessary to remove blood and organic materials. HLD and sterilization are ineffective unless instruments have first been cleaned.

Remember the following:

- Wear utility gloves when cleaning instruments.
- Scrub instruments vigorously with a soft brush in detergent and water to remove all blood, tissue, and other residue completely.
- Rinse instruments thoroughly with water after scrubbing. Detergent may interfere with further processing.
- Allow items to air-dry (items to be high-level disinfected by boiling can be directly placed in the water).

Step 3: Sterilization or HLD

Sterilization

To be effective, sterilization must be preceded by careful cleaning and thorough rinsing. Sterilization eliminates all microorganisms (bacteria, viruses, fungi, and parasites), including bacterial endospores, from instruments and other items.

- Sterilization is the method recommended for items that come in contact with the bloodstream or tissues beneath the skin (such as reusable needles, syringes, and surgical instruments).
- Jointed instruments, such as ringed clamps and dissecting forceps, should be opened or unlocked during sterilization.
- Sterilization uses steam (autoclaving), dry heat (oven), or chemical solutions.

Steam Sterilization

- If items are to be wrapped before steam sterilization, use two layers of paper wrap or two layers of cotton fabric (do not use canvas).
- Items or packs should be arranged to allow free circulation of steam.
- Sterilize items at 121 °C (250 °F) and 106 kPa pressure (15 lbs/in2). Duration should be 30 minutes for wrapped items and 20 minutes for unwrapped items.

Note: Do not begin timing until the steam sterilizer reaches the desired temperature and pressure.

- Allow packs or items to dry before removing them from the steam sterilizer. Allow items to cool before storage or use.
- The steam sterilizer itself should be checked with each use to ensure that it is functioning properly. If repairs are necessary (for example, if gauges and seals are broken), repairs should be made before the machine is used for sterilization.

Dry-Heat Sterilization

- Items can be wrapped in foil or double-layered cotton fabric before dry-heat sterilization.
- Sterilize items at 170 °C (340 °F) for 60 minutes, 160 °C (320 °F) for 120 minutes, or at 150 °C for 2½ hours or at 140 °C for 3 hours.

Note: Do not begin timing until the oven reaches the desired temperature.

- Dry heat can dull sharp instruments and needles. These items should not be sterilized at temperatures higher than 160 °C.
- Items should be allowed to cool before they are removed from the oven.
- Items should then be used immediately or stored in a sterile covered container.

Chemical Sterilization

Soak items in a 2% glutaraldehyde solution (Cidex) for 8 to 10 hours.

- All items must be completely submerged.

- Do not add or remove any items once timing has begun.
- Rinse with sterile water. Do not use boiled water; boiling does not reliably inactivate spores.
- Place instruments on a sterile surface, and air-dry before use or storage.
- Use items immediately, wrap items in sterile paper or cloth, or place items in a covered sterile container.

HLD

If sterilization is unavailable, HLD is the only acceptable alternative for preparing instruments for use in vasectomy. HLD is effective in eliminating all microorganisms, except for some bacterial endospores. HLD should always be preceded by decontamination. To be effective, HLD must be preceded by careful cleaning and thorough rinsing.

- HLD has three methods: boiling, steaming, and chemical HLD.
- After either HLD procedure, items that are not used immediately should be air-dried and stored in a covered, washable high-level disinfected container (for up to one week).
- Jointed instruments, such as ringed clamps and dissecting forceps, should be opened or unlocked during HLD.

Boiling

- Completely immerse items in water. Cover and boil for 20 minutes (start timing when the water begins to boil).
- All items must be completely covered during boiling (place items that float in a weighted, porous bag). Do not add anything to the pot after the water begins to boil.
- Place instruments on a sterile surface and air-dry before use or storage.

Steaming

- This process can be performed together with HLD by boiling or by placing water in the bottom tray of the steamer.
- Place gloves and instruments in tray(s) with holes (up to three trays) and stack them on top of the bottom tray.
- Place the lid on the top tray, and bring the water to boil.
- When steam comes out between the trays, the water is boiling. Reduce the heat, but maintain water at a rolling boil.
- Steam the gloves or instruments for 20 minutes.
- Remove each tray of gloves or instruments, shake off excess water, and place the tray on a second tray that does not have holes.
- Use the gloves or instruments immediately or dry and store in a HLD container.

Chemical HLD

Cover all items with correct dilution of disinfectant [2% glutaraldehyde (Cidex) solution or a 0.5% chlorine solution].

- Soak items for 20 minutes or as per manufacturer's instructions.
- Nothing should be added to or removed from the chemical solution once timing has begun. After soaking items, rinse them with boiled water.

- Place instruments in a high-level disinfected container and air-dry before use or storage.

Step 4: Storage of Processed Items

Proper storage of HLD or sterilized items is as important as the HLD or sterilization process itself.

- Items should be stored dry.
- Do not store pick-up forceps in a bottle filled with antiseptic solution; microorganisms will multiply in standing water even if an antiseptic has been added.
- HLD or sterilize used pick-up forceps each day and store them dry in a high-level disinfected or sterile bottle.
- Wrapped items must be considered contaminated when:
  - The package is torn or damaged
  - The wrapping is wet
  - The expiration date is exceeded
- Wrapped items can be used for up to one week. Wrapped items sealed in plastic can be used for up to one month.
- Unwrapped items must be used immediately or stored in a covered sterile or HLD container (for up to one week).
- If possible, store processed items in an enclosed cabinet.

Table 5–2. Processing of Vasectomy Instruments

* To reduce the risk of exposure to infectious material, machine washing is recommended, if possible.

Table 5–2. Continued

WASTE DISPOSAL

If not disposed properly, contaminated waste is a potential source of infection for both staff and the local community.

- Always wear utility gloves when handling and transporting waste, and wash both the gloves and your hands afterwards.
- Always dispose contaminated waste properly; never simply throw waste outside or leave it in an open pit.
- Always keep a container close to any area where needles or other sharps are used (so that staff would not have to carry these items a long distance before disposal).
- Always keep waste containers in the operating and cleaning areas.

Waste Containers

- Use washable, leak–proof containers.
- For needles and other sharps, use a puncture resistant, lidded container made of metal, heavy cardboard or heavy, rigid plastic. Plastic bottles, emptied of antiseptics or other solutions, can be used for this purpose if they are clearly labeled.
- If a container is reusable, disinfect it with a 0.5% chlorine solution after each use.

Liquid Waste

- If possible, pour waste down a utility drain or into a flushable toilet or a latrine.
- If you cannot pour waste down a drain, latrine, or toilet, bury it in a pit.
- Always be careful when disposing of liquid waste. Do not allow the liquid to splash while you are pouring it.

Solid Waste

- Burn contaminated solid waste. Burning kills microorganisms and is therefore the best method for disposing contaminated solids.
- Burn waste in an incinerator or steel drum as opposed to "open burning."
- If you cannot burn it, bury solid waste in a pit.

Needles and Other Sharps

- Do not bend, break, or clip needles before disposal.
- If possible, do not recap used needles. Most needle-stick injuries occur while replacing needle caps. If recapping is necessary, use the "one-handed" method as follows:

  a. Place the cap on a hard, flat surface. Do not hold it.

  b. Hold the syringe and use the needle to "scoop up" the cap.

  c. When the cap covers the needle completely, carefully secure it on the needle.

Unless you are using a large industrial incinerator, burying containers for needles and other sharps is best. In a drum or small incinerator, burning may not destroy these items, and they may later cause injuries that could lead to serious infections. However, if no other options are available, burning needles and plastic syringes in a drum or small incinerator by themselves (without paper or other waste) will destroy HIV and HBV and will result in a mass of melted plastic that hardens with the needles and other sharps inside.

SESSION VI

SURGICAL PROCEDURE OF NO-SCALPEL VASECTOMY

OVERVIEW

Vasectomy has always been considered a safe and effective easy-to-perform method of contraception for men. Over the years, experts have found ways to make the procedure simpler and more effective than the traditional form. In 1974, Dr. Li Shunqiang developed the NSV technique. NSV is a refined approach for isolating and delivering the vas that requires unique surgical skills. This session provides a detailed description of each step of the approach that will enable the physician to perform NSV.

LEARNING OBJECTIVES

At the end of the session, the participants will be able to:

1. Describe the requirements on facility, instruments, and supplies for the provision of vasectomy services
2. Enumerate chronologically the steps for performing NSV
3. Explain the rationale of each step for performing NSV
4. Perform NSV in accordance with DOH standards

ADVANCE PREPARATION

- PowerPoint presentation of The Surgical Procedure: Performing NSV
- Laptop, LCD, and projector screen
- Meta-cards
- Scrotal model (if available or any alternative)
- Performance checklist for NSV
- Masking tape

TOPIC	TEACHING/LEARNING PROCESS
Session 6 **THE SURGICAL PROCEDURE OF PERFORMING NO SCALPEL VASCETOMY**	◆ Introduce the topic on the surgical procedure of NSV by flashing the slide.
OVERVIEW • Vasectomy has long been a safe, effective, easy-to-perform method of contraception for men. • Throughout its history, people have been trying to find ways to make the procedure simpler and more effective. • In 1974, Dr. Li Shunqiang developed the no-scalpel vasectomy technique. • No-scalpel vasectomy is a refined approach for isolating and delivering the vas that requires unique surgical skills. • This session provides a detailed description of each step of the approach that will enable the physician to perform no-scalpel vasectomy.	◆ Give an overview of the session by presenting the slide.
LEARNING OBJECTIVES At the end of the session, the participants will be able to: 1. Describe the requirements on facility, instruments, and supplies for the provision of vasectomy services. 2. Enumerate chronologically the steps for performing no-scalpel vasectomy. 3. Explain the rationale for each of the steps in performing no-scalpel vasectomy. 4. Perform no-scalpel vasectomy in accordance with DOH standards.	◆ State the learning objectives of the session as presented on the slide.

MINIMUM REQUIREMENTS FOR HIGH QUALITY VASECTOMY SERVICES
• A waiting area with a toilet. The waiting area may also serve as a recovery area after surgery.
• A private space for counseling.
• An examination room for pre-operative assessment and follow-up examination.
• A clean room for surgery equipped with a comfortable, clean table for the client and a good light source.
  ◦ The temperature of the room is critical because it affects the cremasteric and dartos muscles.
  ◦ The room must be warm, even though a cooler temperature may be more comfortable for the surgeon.
	◆ Discuss to the participants the minimum requirements for high quality vasectomy services as presented in the next two slides.

ADVANTAGES OF A WARM ROOM FOR VASECTOMY
• A warm room relaxes the scrotum which facilitates:
  o Manipulation of the vas
  o Fixation of the vas under the median raphe of the scrotum
  o Isolation of the vas from the relaxed spermatic cord
  o Reduction of operating time
  o Reduction of complications
• The temperature of the operating room should be at least 20-25°C.
• If additional warmth is needed to relax the scrotum, a heat lamp or warm towels may be used.	

INSTRUMENTS AND SUPPLIES	
THE RINGED CLAMP • The extracutaneous ringed forcep is a type of clamp used to fix the vas deferens. • This is commonly called the ringed clamp. • The ringed tip of this instrument is used to grasp and encircle the vas without injuring the skin. • The clamp grasps the vas extracutaneously and directly. PICTURE OF THE RINGED FORCEP	

THE DISSECTING FORCEP

- The dissecting forceps is similar to a curved mosquito hemostat, except that the tips are sharply pointed.
- It is used to puncture the scrotal skin, to spread the tissues, to dissect the sheath, and to deliver the vas deferens.
- The dissecting forceps can also be used to grasp the vas while a ligature or cautery is applied for occlusion.
- Because the instrument is a modified hemostat, it can be used to control bleeding.

PICTURE
OF THE DISSECTING FORCEP

ADDITIONAL INSTRUMENTS AND SUPPLIES NEEDED FOR VASECTOMY

- A 10 cc. syringe with a 1½-inch, 25- or 27-gauge needle. These are used to infiltrate the local anesthetic, both for the skin wheal and the vasal block anesthesia.
- Straight scissors, to cut the vas deferens and ligatures.
- Supplies for vasal occlusion (e.g., ligature material)

ANESTHESIA

- Lidocaine (10 cc 1% or 5 cc 2%) without epinephrine is the anesthesia of choice for no-scalpel vasectomy.
- The maximum individual dose of lidocaine should not exceed 4.5 mg/kg of body weight.
- This equates to 30 cc 1% or 15 cc 2% lidocaine.

ANESTHESIA

- Epinephrine is not recommended because it contracts the blood vessels and results in less apparent bleeding during the surgery.
- It is best to be able to detect and control all bleeding during surgery to prevent hematomas from forming after the client leaves the facility.
- If the lidocaine does not contain epinephrine, small bleeding sites are more likely to be detected and controlled during surgery.

PERFORMING NO SCALPEL VASECTOMY

VERIFYING INFORMED CONSENT

- Before any vasectomy is performed, the client must receive appropriate information and counseling and give his informed consent.
- Before performing the procedure, check again with the client to be sure he wants no more children and wishes to proceed with the sterilization procedure.

REVIEW HISTORY AND P.E.

- The preoperative history and examination may be done on the day of surgery or a few days before.
- A medical history should be taken.
- The preoperative physical examination includes examination of the local operative area and other examinations and tests as indicated.
- Laboratory tests are usually not necessary, but if you suspect any clinical abnormality, you will need access to laboratory facilities for which referral may be necessary if such examination is not available in your facility.
- Local skin infections or reproductive tract infections must be treated before vasectomy is performed.

REVIEW MEC

The following are conditions requiring delay or special precautions:

- Local infection (e.g., scrotal skin infection, active sexually-transmitted infection (STI), balanitis, epididymitis, or orchitis
- Previous scrotal surgery
- Large varicocele or hydrocele
- Filariasis; elephantiasis
- Local pathological conditions (e.g., intrascrotal mass, cryptorchidism, or inguinal hernia)
- Bleeding disorders
- Diabetes
- AIDS (HIV-positive status without AIDS is not a concern)

NARRATIVE

FACILITY REQUIREMENTS FOR VASECTOMY SERVICES

Vasectomy can be performed in almost any facility. It is an outpatient procedure that can be performed in an office or clinic. Providing high-quality services involves a few minimum requirements:

- A waiting area with a toilet. The waiting area may also serve as a recovery area after surgery.
- A private space for counseling.
- An examination room for preoperative assessment and follow-up examination.
- A clean room for surgery equipped with a comfortable, clean table for the client and a good light source.

The temperature of the room is critical because it affects the cremasteric and dartos muscles. The room must be warm, even though a cooler temperature may be more comfortable for the surgeon. A warm room facilitates the following by relaxing the scrotum:

- Manipulation of the vas
- Fixation of the vas under the median raphe of the scrotum
- Isolation of the vas from the relaxed spermatic cord
- Reduction of operating time
- Reduction of complications

The temperature of the operating room should be at least 20 °C to 25 °C. If additional warmth is needed to relax the scrotum, a heat lamp or warm towels may be used.

INSTRUMENTS AND SUPPLIES

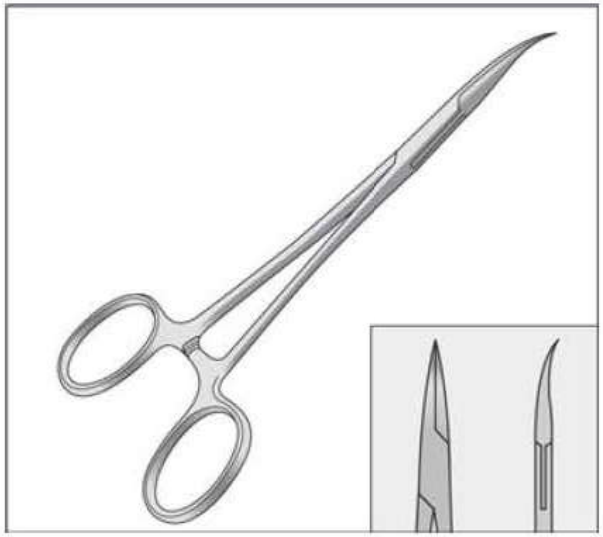
NSV requires two instruments designed by Dr. Li Sunqiang: the ringed clamp and the dissecting forceps.

Commonly called the ringed clamp, the extracutaneous ringed forcep (Figure 6-1) is a type of clamp used to fix the vas deferens. The ringed tip of this instrument is used to encircle and grasp the vas without injuring the skin. The clamp grasps the vas extracutaneously and directly.

Figure 6-1. Ringed Clamp

The *dissecting forceps* (Figure 6-2) is similar to a curved mosquito hemostat, except that the tips are sharply pointed. This tool is used to puncture the scrotal skin, to spread the tissues, to dissect the sheath, and to deliver the vas deferens. The dissecting forceps can also be used to grasp the vas while a ligature or cautery is applied for occlusion. As the instrument is a modified hemostat, it can be used to control bleeding.

Figure 6-2. Dissecting Forceps



Additional instruments and supplies needed for NSV are the following:

- A 10 cc syringe with a 1 ½-inch, 25- or 27-gauge needle (U.S. system). These tools are used to infiltrate the local anesthetic, both for the skin wheal and the vasal block anesthesia.
- Straight scissors, to cut the vasa deferentia and ligatures.
- Supplies for vasal occlusion (e.g., ligature material).

Table 6-1 presents a complete list of instruments and supplies needed for NSV.

Table 6–1. Instruments and Supplies Needed for NSV

Instruments
• Ringed clamp
• Dissecting forceps
• Straight scissors
Supplies
• Adhesive tape and gauze for positioning the penis away from the surgical field (optional)
• Scissors for clipping any scrotal hair that would interfere with the procedure
• Soap and water or antiseptic agents for the surgical scrub *(see page 13)*
• Alcohol rinse (recommended if plain soap is used for the surgical scrub)
• Sterile gloves
• Nonirritating antiseptic solution for cleaning the operative area *(see page 12)*
• Sterile drapes
• 10-cc syringe with a 1½-inch, 25- or 27-gauge needle (U.S. system)
• 1% or 2% lidocaine without epinephrine[a]
• Supplies for vasal occlusion according to the surgeon's preference (examples: a cautery unit; chromic catgut or nonabsorbable silk or cotton for ligation)
• Sterile gauze
• Adhesive tape or Band-Aid for dressing the wound
• Scrotal support for the man to wear after the procedure (optional)

ANESTHESIA

Lidocaine (10 cc 1% or 5 cc 2%) without epinephrine is the anesthesia of choice for NSV. Epinephrine is not recommended because it contracts the blood vessels and results in less apparent bleeding during the surgery. All bleeding during surgery must be detected and controlled to prevent hematomas from forming after the client leaves the facility. If the lidocaine does not contain epinephrine, small bleeding sites are more likely to be detected and controlled during surgery.

The maximum individual dose of lidocaine without epinephrine should not exceed 4.5 mg/kg of body weight. This amount equates to 30 cc 1% or 15 cc 2% lidocaine without epinephrine.

PERFORMING NO-SCALPEL VASECTOMY

Verifying Informed Consent

Before any vasectomy is performed, the client must receive appropriate information and counseling and give his informed consent. Before performing the procedure, check again with the client to be sure he wants no more children and wishes to proceed with the sterilization procedure.

Reviewing Client's History and Physical Examination Findings

The preoperative history and examination may be done on the day of surgery or a few days before. A medical history should be taken. The preoperative physical examination includes examination of the local operative area and other examinations and tests as indicated. Laboratory tests are usually not necessary, but if any clinical abnormality is suspected, laboratory facilities must be accessed. In this case, a referral may be necessary if such examination is not available in the facility. Local skin infections or reproductive tract infections must be treated before vasectomy is performed.

The following are conditions requiring delay or special precautions:

- Local infection (e.g., scrotal skin infection, active STI, balanitis, epididymitis, or orchitis)
- Previous scrotal surgery
- Large varicocele or hydrocele
- Filariasis; elephantiasis
- Local pathological conditions (e.g., intrascrotal mass, cryptorchidism, or inguinal hernia)
- Bleeding disorders
- Diabetes
- AIDS (HIV-positive status without AIDS is not a concern.)

Check the WHO MEC for Male Sterilization on Session 4.

Preparing the Client for Surgery

Before surgery, instruct the client to wash his genital area thoroughly with soap and water. During surgery, he wears clean clothing or a surgical gown. The client lies comfortably in a supine position on the table, possibly with a small pillow under his head.

Securing the Penis

To make the operation easier, position the penis away from the operative field. The surgical drape is usually adequate for securing the penis and keeping it away from the operative field.

Cleaning the Surgical Site

Shaving the surgical site is not recommended, as doing so produces small nicks and breaks in the skin where bacteria can grow and multiply and thus increases the risk of postprocedure infection. If the scrotal hair is obstructing the small operative area, clip it while the client lies on the table. However, if the site must be shaved, use antimicrobial soap and water, or shave dry; and shave immediately before the procedure while the client is on the table.

Before cleaning the area, examine the scrotal area. Palpate the scrotum and vas to assess the thickness of the scrotal skin and the diameter of the vas. Gently wash the scrotum with a warm antiseptic solution (either povidone-iodine or chlorhexidine). Be sure to cleanse the area under the scrotum where your fingers will be placed. Scrub the pubic area, the penis, and the upper thighs as well. In hot climates, solutions at room temperature are usually adequate. In cool climates, warming the antiseptic solution may be necessary.

Ensuring Asepsis

NSV is a minor surgical procedure that requires aseptic procedures to prevent infection.

- Perform hand scrubbing as previously described.
- Wear a clean shirt or apron. A sterile gown, cap, and mask are optional.
- Wear sterile surgical gloves. Change gloves between each case. If scrubbing is not feasible between cases, scrub for three minutes every hour or at least after every four or five cases (whichever comes first) to prevent recolonization of the skin.
- Cover the prepared area with a sterile fenestrated drape, and lift the scrotum through the drape's small window. A set of towels can be used as an alternative to the drape. The window should be small enough to allow only the scrotum to be isolated.
- Cover a small instrument table with a sterile drape.

Administering the Local Anesthetic

Preparing the Anesthetic

Prepare a syringe with 100 mg (10 cc 1% or 5 cc of 2%) lidocaine without epinephrine.

Isolating the Right Vas: The Three-Finger Technique

a. If you are right-handed, stand on the client's right side (if you are left-handed, stand on the client's left side).

b. Place your left thumb approximately midway between the testis and the base of the penis on the median raphe.

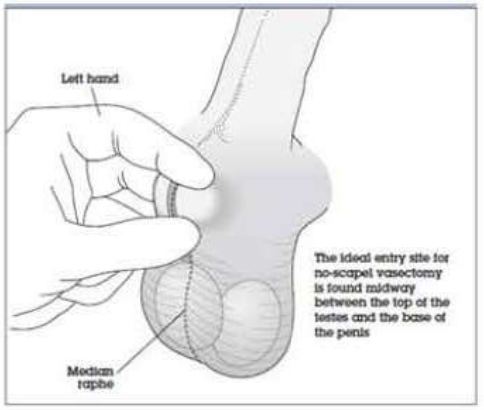
c. With the middle finger of your left hand under the scrotum, palpate the vas and sweep it toward the raphe beneath your thumb.

d. Hold the vas in position between the thumb and middle finger while placing your index finger on top of the scrotum slightly above the thumb (Figure 6-3).

Note that your fingers should be perpendicular to the vas. You will have created a "window" between your thumb and index finger through which you will make the puncture. Upward pressure from the middle finger combined with downward pressure exerted by the index finger creates a bend in the vas for easy entry.

e. Maintain the three-finger hold as you anesthetize the right side.

Figure 6-3. The Three-finger Technique



Raising the skin wheal

a. The needle entry site is at the midline, over the vas deferens midway between the thumb and index finger. Use only the tip of the needle to raise a superficial skin wheal, 1 cm to 1 ½ cm in diameter (Figure 6-4).

b. To raise the skin wheal, hold the syringe at approximately 5- to 15-degree angle (Figure 6-5), with the needle bevel facing up.

c. Inject lidocaine into the dermis and subcutaneous tissues; 0.5 cc is usually adequate.

Figure 6-4. Raising the Skin Wheal

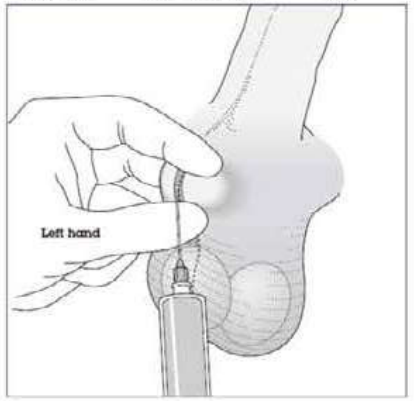
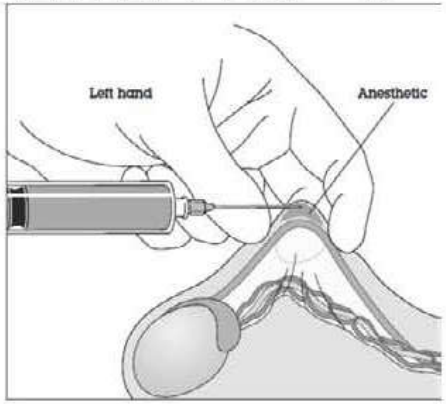


Figure 6-5. Side View of the Skin Wheal



Avoid two pitfalls when raising the skin wheal:

- Do not inject the lidocaine too deeply. At this point in the procedure, you are anesthetizing the scrotal skin. In the next step, you will create a vasal block that will anesthetize deeper tissues.
- Do not inject more than 1 cc of lidocaine to avoid swelling around the vas at the puncture site. A persistent wheal will prevent the ringed clamp from closing properly around the vas.

Creating the Vasal Block: Right Vas

a. After creating the superficial skin wheal, advance the needle parallel to the vas within the external spermatic fascial sheath toward the inguinal ring (Figure 6-6).

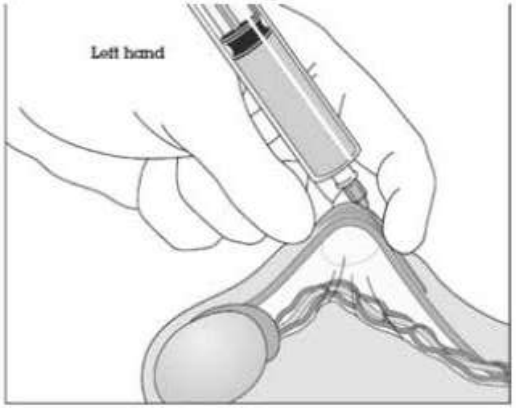
b. Advance the full-length of the needle without releasing any of the anesthetic.

c. Gently aspirate to ascertain that the needle is not in a blood vessel.

d. Slowly inject 2 cc to 5 cc (depending on concentration) of lidocaine within the external spermatic fascial sheath around the right vas deferens.
HINT: When the needle is in proper position and the injection is performed inside the external spermatic fascia, no resistance to the injection will occur.

e. Remove the needle from the right sheath; do not inject lidocaine while withdrawing the needle.

Figure 6-6. Advancing the Needle



Isolating the Left Vas: The Three-Finger Technique

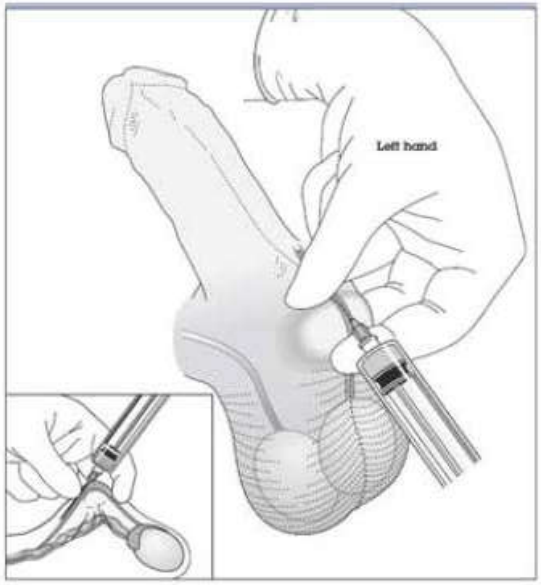
HINT: To hold the client's left vas in the three-finger grip while standing on his right side, you will be more comfortable if you take a step toward the client's head and turn a bit to face his feet. To approach the vas in this lateral position, reach across the client's abdomen with your left hand.

a. Place your thumb in the upper third of the scrotum while the index finger is in the middle third. This step is different from the three-finger hold on the right side.

b. As with the right side, position the middle finger beneath the scrotum to identify the vas and sweep it to the puncture site. At this point, the thumb is superior to the index finger (Figure 6-7).

Figure 6-7. Isolating the Left Vas: The Three-Finger Technique

Figure 6-8. Anesthesia Technique: Deep Infiltration



Creating the Vasal Block: Left Vas

a. Reintroduce the needle through the same hole previously used; a second skin wheal is not needed.

b. Advance the needle parallel to the left vas into the external spermatic fascia (Figure 6–8).

c. As with the right vas, inject 2 cc to 5 cc of lidocaine within the external spermatic fascial sheath around the left vas deferens.

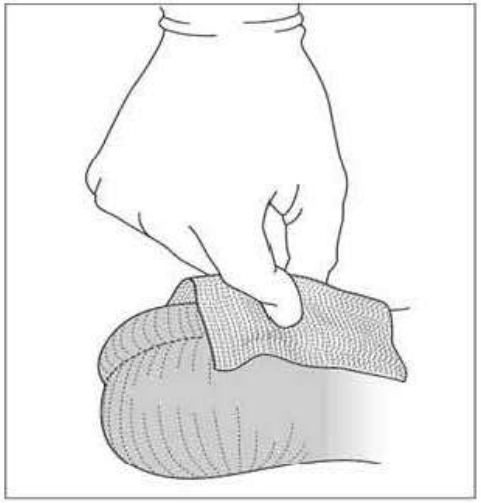
Pinching the Skin Wheal

After removing the needle, gently pinch the skin wheal between the thumb and index finger for a few seconds to reduce its size and to soften and thin the local tissues (Figure 6–9).

Remember a persistent wheal will prevent the ringed clamp from closing properly around the vas; gentle compression will reduce the size of the wheal.

If the client still feels pain when the surgical procedure begins, repeat the vassal block on the painful side. Do not raise another skin wheal.

Figure 6–9. Pinching the Skin Wheal



Surgical Approach and Occlusion of the Vas

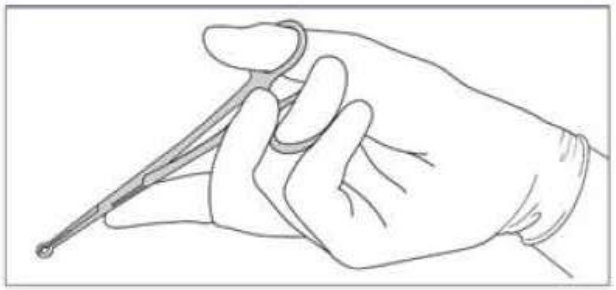
Holding the ringed clamp

The following are important points to remember when holding the ringed clamp:

- For the greatest control and accuracy, hold the ringed clamp with the palm facing up and the wrist extended (Figure 6–10).
- Apply the clamp at a 90-degree angle perpendicular to the vas (Figure 6–11a); the palm-up hand position facilitates this procedure.
- Hold the shaft of the ringed clamp in line with the axis of the vas, that is, parallel to and directly over the vas (Figure 6–11c).

Failure to follow these points may result in the clamp not fixing the vas completely or grasping too much skin. The ringed clamp must encircle the entire vas.

Figure 6–10. Holding the Ringed Clamp (Palm Up)



Applying the Ringed Clamp to the Scrotal Skin and Underlying Right Vas: The Tight-Skin Technique

a. Using the three-finger technique, tightly stretch the skin overlying the vas where the needle entered for anesthesia infiltration. The skin should be as thin as possible.

b. Apply the ringed clamp with the shaft at a 90-degree angle perpendicular to the vas (Figure 6–11a).

c. Open the ringed clamp, and press the tips onto the skin immediately overlying the vas (Figure 6–12).

d. Apply upward pressure with the middle finger underneath the scrotum to resist the downward push of the ringed clamp and to press the vas from below into the ring.

e. Slowly and gently close the clamp around the vas, up to the first click-stop. Note that the cantilevered feature of the ringed clamp that is manufactured in China is specially designed to prevent damage to the scrotal skin even when the clamp is locked tightly.

Avoid two pitfalls when applying the ringed clamp:

- Be sure to elevate the middle finger underneath the scrotum. Otherwise, the finger will give way under the downward pressure of the ringed clamp, and you will have difficulty stabilizing the vas.
- Do not grab too much skin with the ringed clamp. If you do, you will have difficulty dissecting and delivering the vas, and slight bleeding may occur. The skin should be stretched out over the vas just before the ringed clamp is applied. If you grab too much skin, stabilize the vas with your left hand, then loosen the clamp slightly without entirely releasing it. Use the fingers of the left hand to ease some of the skin away from the clamp's hold while retaining the clamp's grasp on the vas.

Figure 6–11. Grasping the Vas with the Ringed Clamp (extracutaneously)

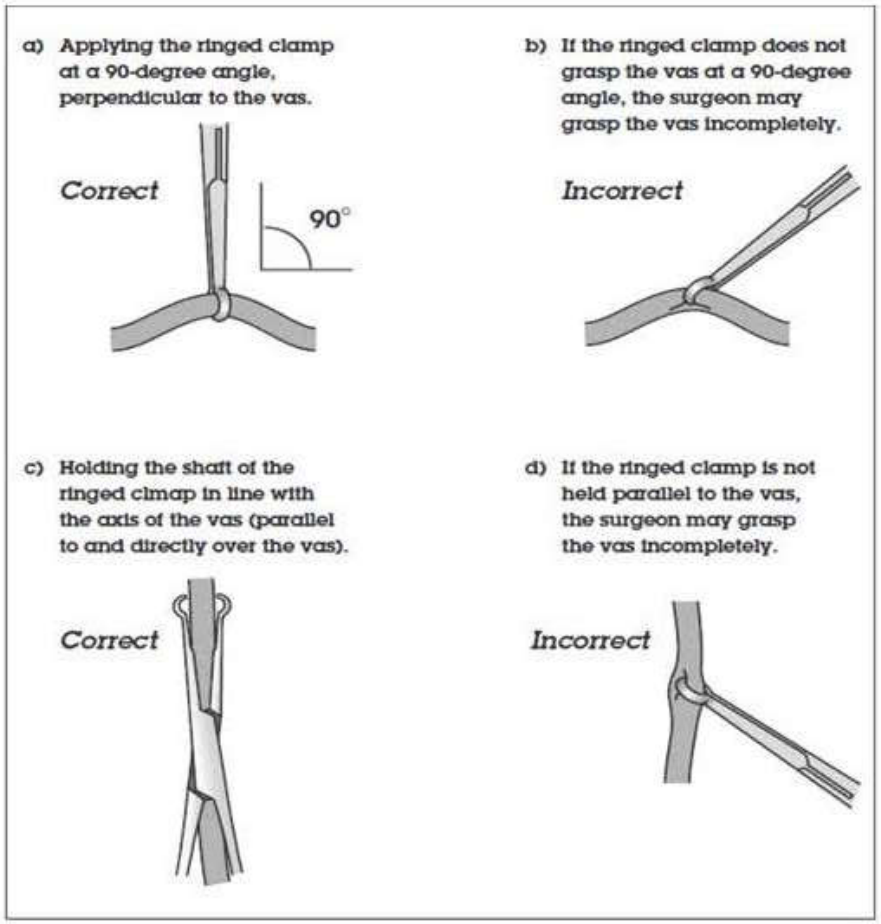
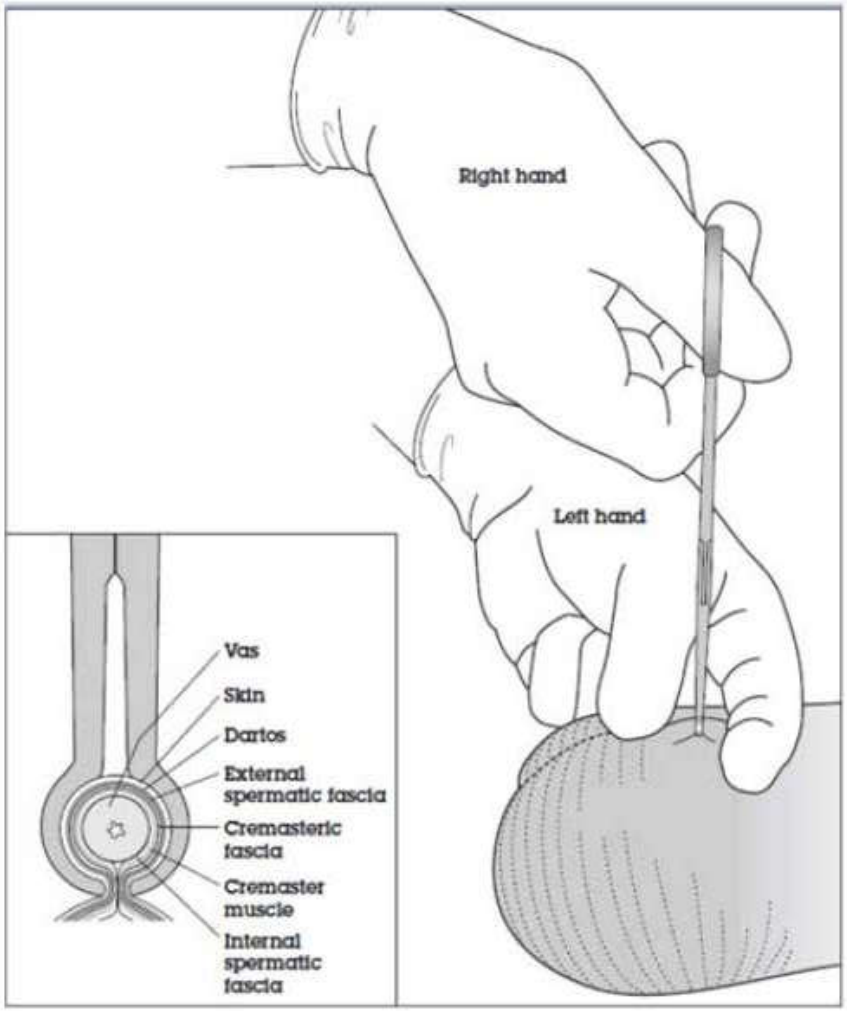


Figure 6–12. Pressing the Tips of the Ringed Clamp onto the Scrotal Skin Overlying the Right Vas



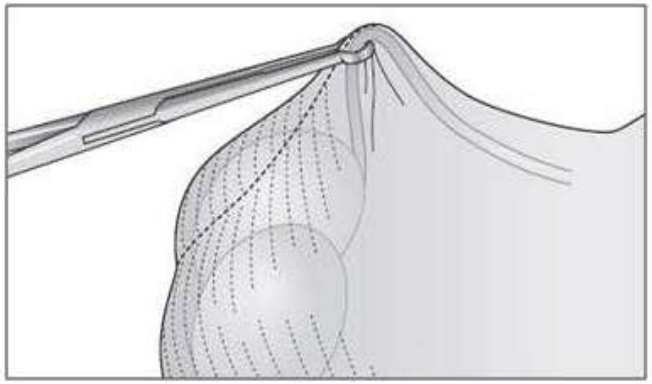
Elevating the Underlying Right Vas

a. While the ringed clamp is still grasping the scrotal skin and the underlying right vas, transfer the instrument to your left hand.

b. Then, lower the handles of the ringed clamp, causing a bend in the vas (Figure 6-13). This motion elevates the vas.

c. Continue to keep the shaft of the clamp in line with the longitudinal axis of the vas.

Figure 6–13. Lowering the Handles of the Ringed Clamp to Elevate the Vas



Puncturing the Scrotal Skin

a. The skin should be punctured in the previously anesthetized spot, midway between the top of the testes and the base of the penis. With the left index finger, press downward lightly to tighten the scrotal skin just ahead of the tips of the ringed clamp and over the anesthetized area (Figure 6-14).

b. Hold the dissecting forceps in the right hand, points curved downward, in preparation for puncturing the vas. Hold the instrument so that the closed tips of the forceps and the vas are at a 45-degree angle.

c. Open the dissecting forceps and using the medial blade of the forceps, pierce the scrotal skin just superior to the upper edge of the ringed clamp where the vas is most prominent (Figure 6-15). The result should be a puncture of the midline of the vas, preferably at the point where the needle entered for anesthetic infiltration. When making the puncture, do not slowly push the dissecting forceps forward. Instead, use a quick, sharp, single movement to make a clear puncture of the skin down into the vas. Advance the medial blade of the forceps into the vas lumen.

The following pitfalls must be avoided when puncturing the scrotal skin:

- Be sure to penetrate the anterior wall of the vas with the dissecting forceps. Intact overlying fascia will prevent elevation of the vas out of the puncture wound.
- If puncturing is too deep, transaction of the vas might occur, and the vas artery may be transected; bleeding will follow.

- Be sure to puncture the vas just superior to the upper edge of the ringed clamp. If the puncture is made in the tissue that is grasped by the ringed clamp, you will not be able to spread the tissues adequately.

Figure 6–14. Tightening the Scrotal Skin

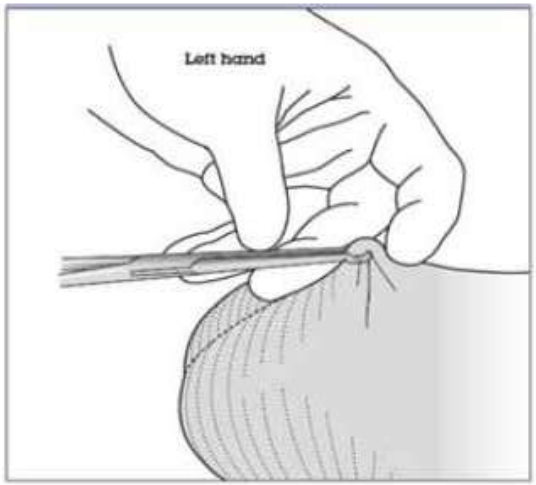
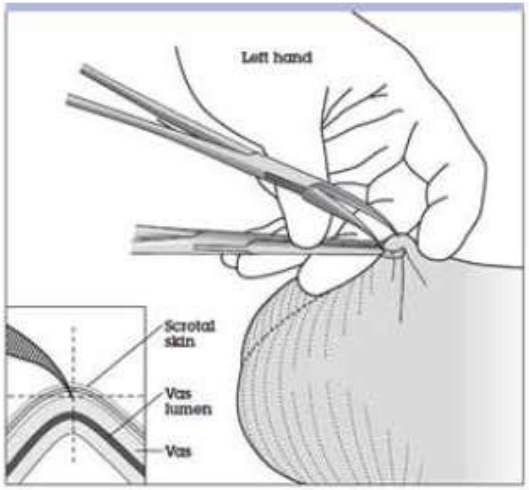


Figure 6–15. Piercing the Skin with the Medial Blade of the Dissecting Forceps



Spreading the Tissues

a. After making the puncture, withdraw the medial blade of the dissecting forceps. Close the tips of the forceps.

b. At the same 45-degree angle as before, insert both tips of the forceps in the same puncture hole, in the same line, and at the same depth as when you made the puncture with the single blade (Figure 6-16). The ringed clamp remains in place and locked while the skin punctured.

c. Gently open the tips of the dissecting forceps transversely across the vas to create a skin opening twice the diameter of the vas (Figure 6-17).

d. In one motion, spread all layers of tissue from the skin to the vas deferens. The tips of the forceps should penetrate deeply enough to expose bare the vas wall. No harm is done if you enter the lumen. Be careful to keep the closed blades of the dissecting forceps parallel to the vas.

e. The skin and vas sheath will remain open after the tissues are spread. By contrast, the opening in the vas will close after spreading; as it closes, the puncture site in the vas may look like a longitudinal groove. The stretched opening in the skin and sheath, which should be twice the diameter of the vas, will enable you to lift out a loop of the vas. The ringed clamp remains in place and locked while the tissues are spread.

The following two pitfalls must be avoided when spreading the tissues:

- If you fail to open the blades of the forceps transversely at a right angle to the vas, one blade could slip out of the puncture site. An unnecessary skin tear may result.
- Be sure to apply appropriate counterforce to prevent the dissecting forceps from slipping out of the puncture hole. Maintain depth of puncture, but do not push down further than the original puncture.

Figure 6-16. Inserting Both Tips of the Dissecting Forceps into the Puncture Site

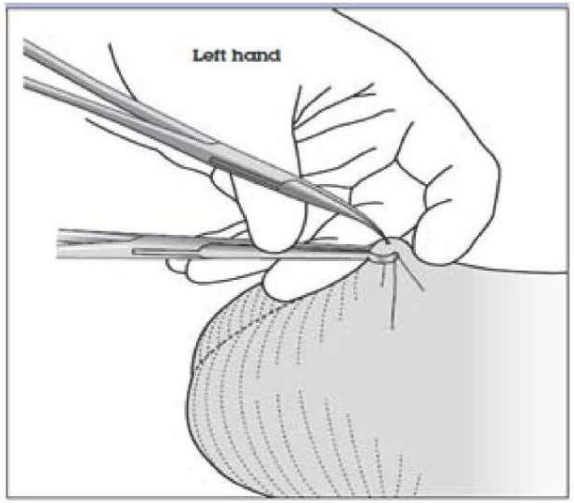
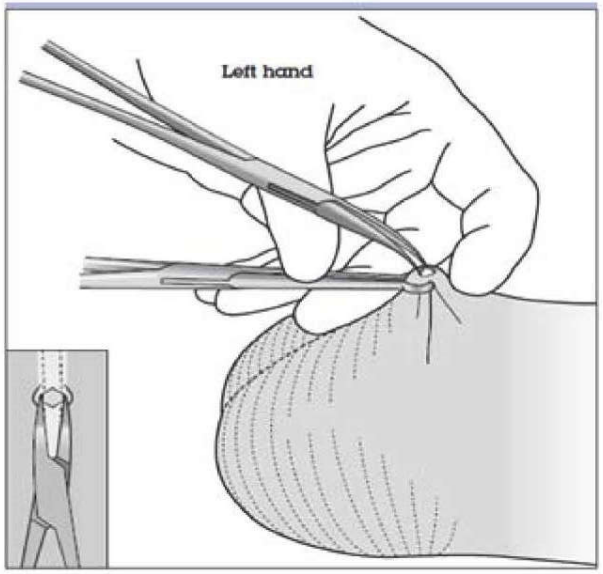


Figure 6-17. Spreading the Tissues



Delivering and Elevating the Right Vas

a. Remove the dissecting forceps from the puncture hole.

b. With the tip of the lateral blade of the dissecting forceps facing downward, pierce the wall of the vas deferens at a 45-degree angle (Figure 6-18). Use of the lateral blade enables the surgeon to rotate his or her wrist more easily.

c. With the lateral blade skewering the vas and the ringed clamp still grasping the scrotal skin, rotate the handle of the dissecting forceps clockwise 180 degrees so the tips face upward to deliver a loop of the vas deferens (Figure 6-19 and 6-20).

d. As you rotate the dissecting with the right hand, slowly release the ringed clamp with the left hand, thus allowing the forceps to elevate the vas through the puncture hole (Figure 6-21). At the beginning of the rotation, your hand will be palm-side down; after rotation, it will be palm-side up.

e. If the vas is difficult to deliver, more extensive spreading of the sheath may be required.

Figure 6-18. Piercing the Wall of the Vas

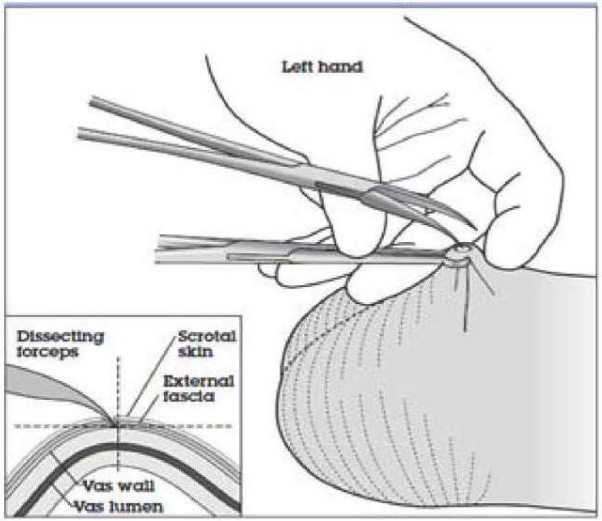


Figure 6-19. Rotation of the Dissecting Forceps, Part 1

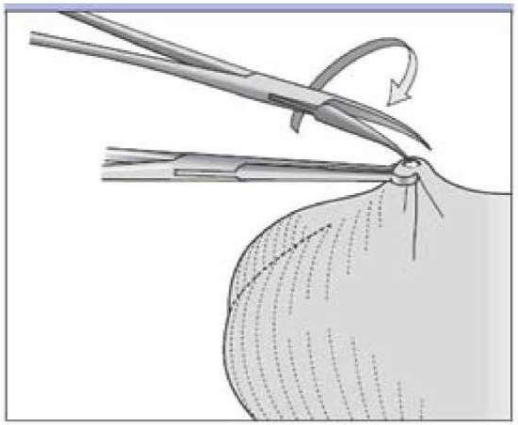


Figure 6-20. Rotation of the Dissecting Forceps, Part 2

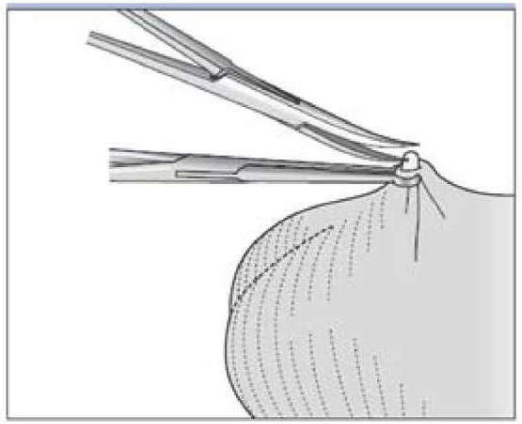
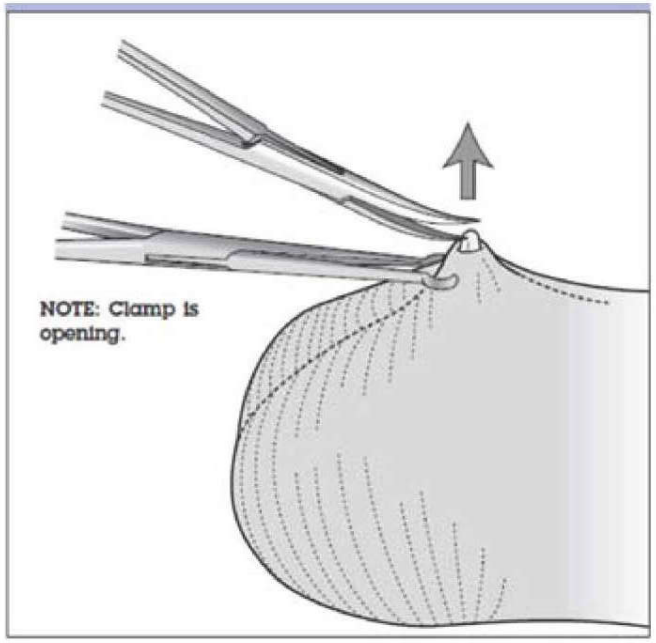


Figure 6-21. Releasing the Ringed Clamp Before Elevating the Vas with the Dissecting Forceps—Ringed Clamp Open but In Place



Watch out for two pitfalls while delivering the vas:

- Do not attempt to deliver the vas while the ringed clamp is locked. If you do, the vas may be severed.
- If fascial tissue is caught between the tips of the dissecting forceps, you will not be able to rotate and elevate the vas.

Grasping the Vas with the Ringed Clamp

a. Once a loop of the vas has been delivered, gently close the dissecting forceps on the vas to prevent its slipping back into the scrotum while the ringed clamp is removed from the skin.

b. Grasp a partial thickness of the loop of the vas with the ringed clamp.

c. After you have grasped a partial thickness of the vas, release the dissecting forceps.

Figure 6–22. Grasping a Partial Thickness of the Elevated Vas

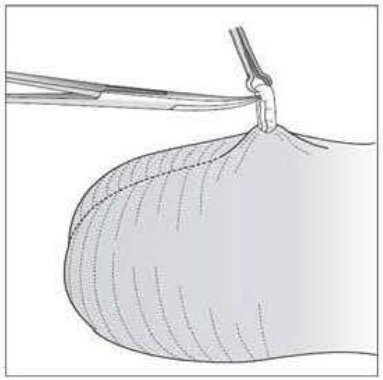
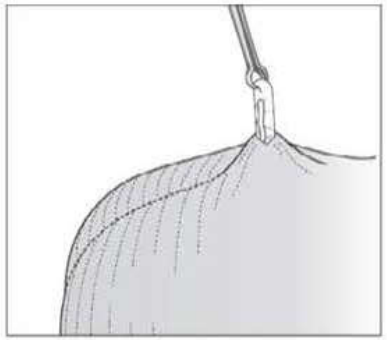


Figure 6–23. Grasping a Partial Thickness of the Elevated Vas at the Crest of the Loop (with only the ringed clamp attached)



The following pitfalls must be avoided when grasping the vas with the ringed clamp:

- Be careful not to release the dissecting forceps until you have grasped a portion of the loop of vas with the ringed clamp (Figure 6–22). This procedure will prevent the vas from slipping back into the scrotum.
- Avoid damaging the vas artery by grasping the vas at the crest of the loop (Figure 6–23). Grasping elsewhere leads to asymmetrical stripping of the sheath from the vas.
- Grasp only a partial thickness of the vas. If the ringed clamp is placed around the entire circumference of the vas, the vas could slip back into the scrotum when it is divided.

Puncturing and Stripping the Sheath

a. With one tip of the dissecting forceps (tips facing up), gently puncture the vas sheath just below the vas, taking care not to injure the vas artery (Figure 6–24). Then, remove the tip.

b. Close the tips of the dissecting forceps. Insert both tips (tips facing to the side) into the punctured sheath (Figure 6–25).

c. Gently open the dissecting forceps (Figure 6–26). Strip the sheath and surrounding tissue downward for at least a 1 cm length of the vas. This motion is longitudinal, not transverse.

d. Be careful to avoid blood vessels. Tie bleeders immediately. When checking for bleeding, pay particular attention to the abdominal segment of the vas, which is where bleeding from the vas artery could occur and result in hematoma formation.

Figure 6–24. Puncturing the Sheath with One Tip of the Dissecting Forceps

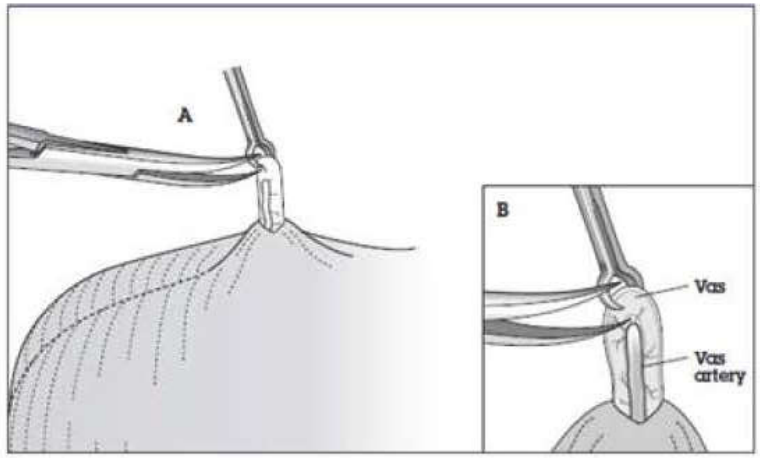


Figure 6–25. Inserting Both Tips of the Dissecting Forceps into the Punctured Sheath (tips facing to the side)

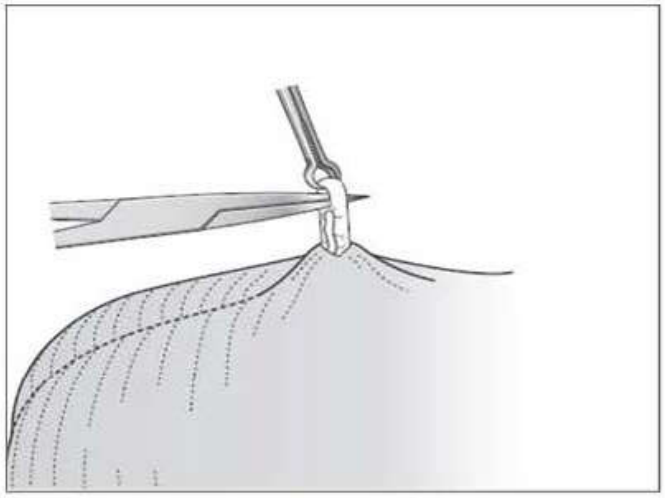
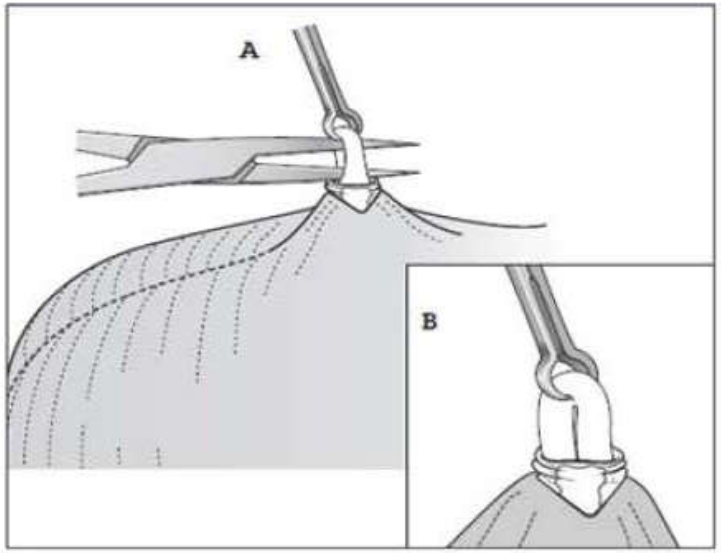


Figure 6–26. Opening the Dissecting Forceps to Strip the Sheath



Ligating and Excising the Right Vas

The chosen method for occluding the vas is ligation with excision and fascial interposition. Fascial interposition improves the effectiveness of vasectomy when used with ligation and excision of the vas. Fascial interposition places a tissue barrier between the two cut ends of the vas. The stump of the prostatic (proximal) end is outside the fascial sheath. When the vasectomy is completed, the stump of the testicular (distal) end is inside the fascial sheath.

a. Before beginning ligation, make certain that all sheath and vassal vessels have been stripped away from the segment of the vas to be occluded.

b. Ligate the isolated vas at two points about 1.5 cm or more apart using two separate ligatures, first ligating the prostatic end of the vas and then the testicular end.

c. After ligating the prostatic end, cut one end of the ligature, leaving a single uncut end of about 5 cm to 7 cm in length (Figure 6-27b). In this way, the prostatic end will be identified. The single uncut end of the ligature will be used to retrieve the vas to facilitate fascial interposition.

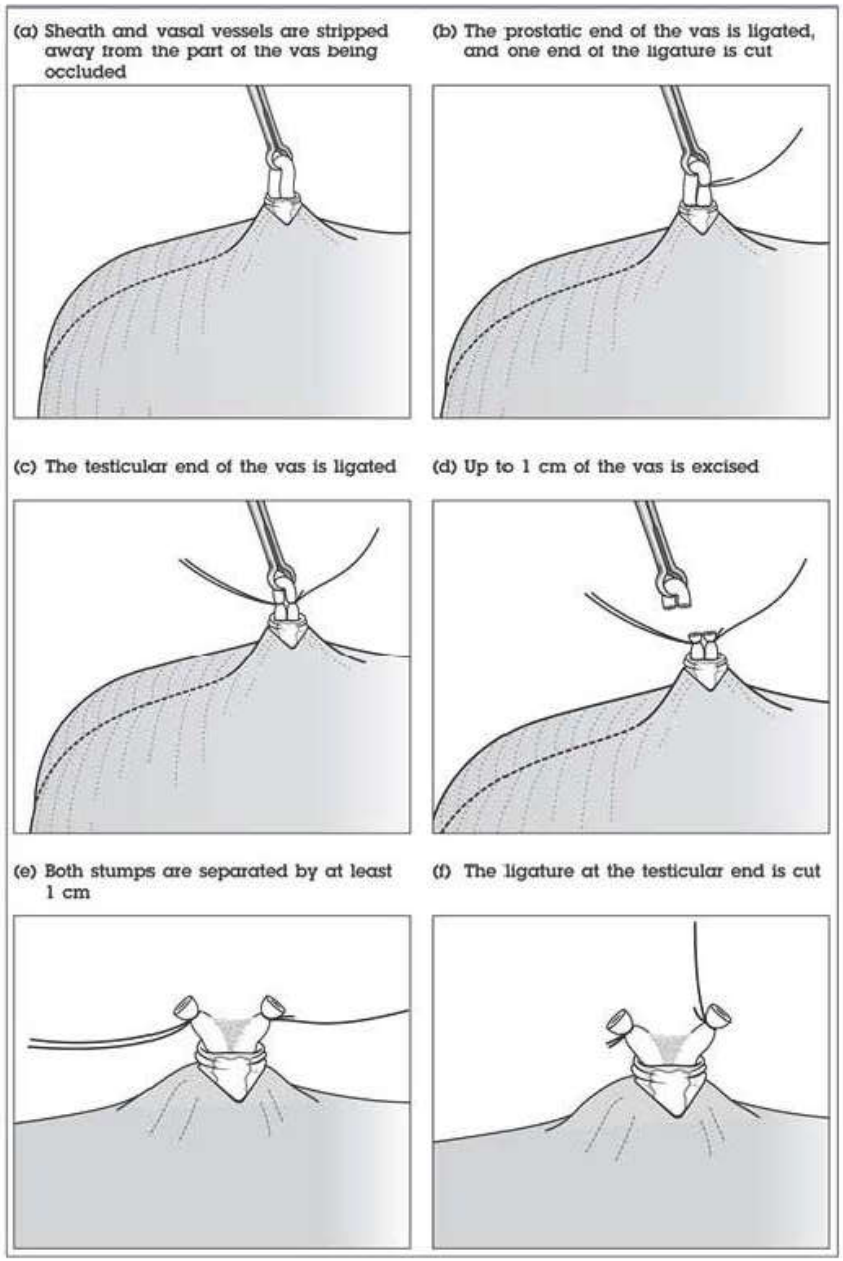
d. Ligate the testicular end and leave both ends of the ligature about 5 cm to 7 cm in length. When excising the section of vas, leave an adequate stump at each end of the vas (approximately 3 mm) to ensure that the ligature does not slip off later.

e. Excise up to 1 cm of the vas. When excision is completed, assure that both stumps are not too close by pulling both ligatures.

f. Separate both stumps by at least 1 cm (Figure 6-27e). Inspect for bleeding, and control it when it is present. Before the ligature of the testicular end is trimmed, hemostasis must be assured.

g. After assuring that both stumps are separated, cut the ligature at the testicular end.

Figure 6–27. Steps in Performing Vasectomy by Ligation with Excision



Creating Fascial Interposition

a. Allow both ends of the vas to drop back into the scrotum by gently pinching and pulling up on the scrotum with the thumb and index finger until the prostatic end is felt passing through the fingers.

b. Start the fascial interposition technique by very gently pulling the uncut ligature of the prostatic end through the puncture wound (Figure 6–28c). As the vas appears, it should be covered with the fascial sheath, which is seen as a translucent membrane covering the stump of the cut vas. If the translucent membrane (the fascial sheath) is not seen covering the vas, the vas should be dropped back into the scrotum and gently pulled out again.

c. Carefully grasp and hold tight the fascial membrane. Using the tip of the dissecting forceps (Figure 6–28d), tie the fascial membrane about 2 mm or 3 mm below the previous tie of the prostatic end (Figure 6–28e). Then, cut both ends of the ligature.

d. Allow the stump of the prostatic end to drop back into the scrotum by gently pinching the scrotum so that the stump falls back to its original position.

e. After assuring by palpation with the thumb and middle finger that the prostatic end is in the correct position, pull the single ligature just enough to see that the stump of the testicular end is inside the fascial sheath.

Make sure not to tie the fascia with the vas while ligating to occlude the vas. If the fascia is tied with the vas during ligation, then fascial interposition will be difficult and may not even be possible to perform.

Figure 6–28. Steps in Completing Vasectomy by Fascial Interposition

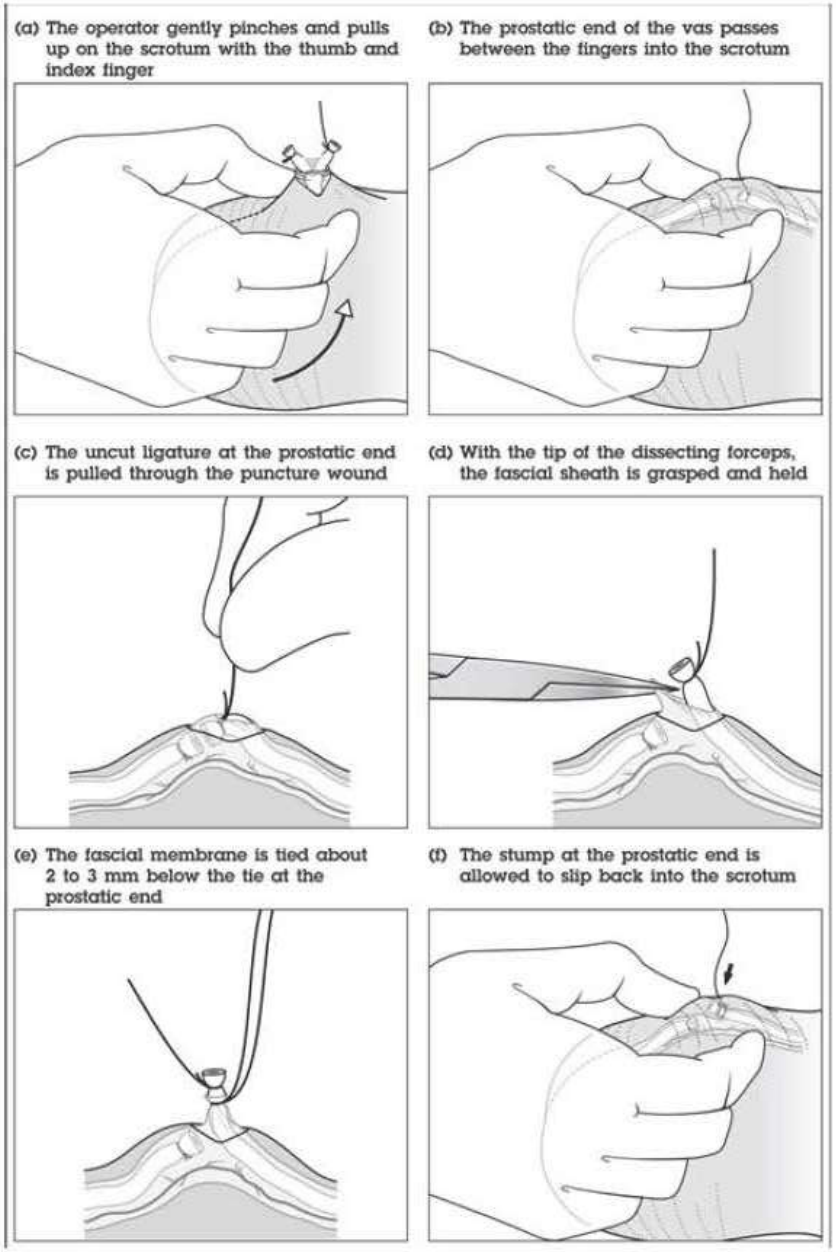
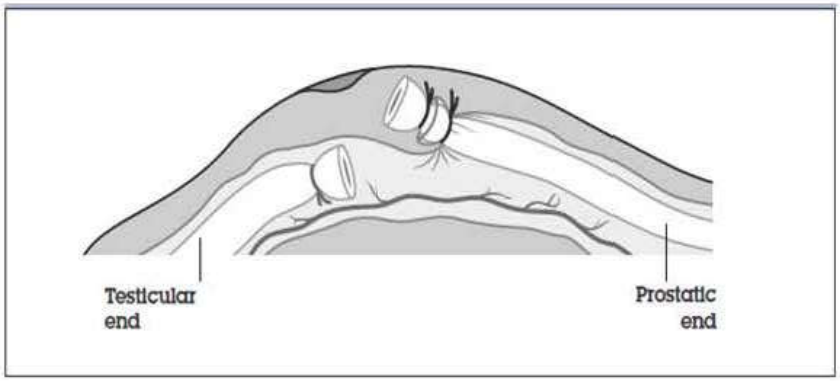


Figure 6–29. Completed Fascial Interposition (with the stump of the prostatic end outside the fascial sheath and the stump of the testicular end inside the fascial sheath)



Isolating the Left Vas before Occlusion

a. Adjust the left hand to grasp the left vas deferens, using the three-finger technique.

b. Place the middle finger below the scrotum, with the thumb and index fingers above the scrotum; position the vas directly under the previously opened puncture site. See Figure 6–30.

Figure 6–30. Isolating the Left Vas Before Occlusion