
UNIT 28 SURGICAL METHODS

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28.0 OBJECTIVES

After reading this unit, you will be able to:

- select the clients for vasectomy/tubectomy procedures;
- take preventive measures to check post operative infection;
- manage complications of sterilisation procedures;
- follow-up the clients adopting the permanent method of contraception; and
- practice infection prevention techniques.

28.1 INTRODUCTION

Despite our attempts to increase the range of choice of contraceptive methods, sterilization continues to be the sheet anchor of our Family Planning Programme. Female sterilisation occupies a pre-eminent position and still the female sterilisation (tubectomy) outnumbers vasectomy still. The importance of knowing what is the most suitable method of female sterilisation for use on a mass scale and what are the minimum facilities and expertise that are needed to ensure maximum safety cannot be over-emphasised.

Sterilisation, although a safe, simple and effective surgical procedure, is still associated with complications. In the male, vasectomy can be performed as an OPD procedure. The nonscalpel vasectomy is becoming increasingly popular. In a vast country like India where facilities vary in different parts of the country and from hospital-to-hospital, a uniform guideline indicating the minimum facilities and expertise necessary to perform tubal ligation/non scalpel vasectomy with minimal complications is made available to the peripheral centres. In this unit we will learn these guidelines so as make the sterilisation procedures safe.

28.2 SELECTION OF CLIENTS

In this section, eligibility criteria, method specific counselling for sterilisation and how to take informed consent are described.

28.2.1 Eligibility Criteria

The client must have been married.

Male clients should ideally be below the age of 60 years

Female clients should be below the age of 45 years and above 22 years.

Although the number of children the couple has is not a necessary criterion, they should have at least one child whose age is above one year.

Clients or their spouses must not have undergone sterilisation in the past (not applicable in cases of failure of previous sterilisation).

Clients must be in a perfectly normal state of mind so as to understand the full implications of sterilisation.

Mentally ill clients must be certified by a psychiatrist and consent should be given by the legal guardian /spouse.

28.2.2 Counselling for Sterilisation

Counselling is the process of helping clients make informed and voluntary decisions about fertility. The following steps must be taken before the client signs the consent form:

They must be informed of all the available methods of family planning, including oral pills, IUCD, condoms and sterilisation.

Clients must make an informed decision for sterilisation voluntarily.

They must be counselled in the language they understand.

Clients must be made to understand what will happen before, during and after the surgery; its side-effects or potential complications.

The following features of the sterilisation procedure must be explained to the client:

- It is a safe and simple procedure
- It is a permanent procedure for preventing future pregnancies

- It is a surgical procedure that has a small risk of complications requiring further treatment
- It does not affect sexual pleasure, ability or performance
- It will not affect the client's strength or his ability to perform normal day-to-day functions
- It has a small chance of failure, even if performed under optimum circumstances
- After vasectomy, it is necessary to use a back-up contraceptive method either for 20 ejaculations or for a period of three months
- Sterilisation does not give protection against RTI/STD HIV and AIDS.

Clients must be encouraged to ask questions to clarify his/her doubts, if any.

Clients must be told that they have the option of deciding against the procedure at any time without sacrificing their right to other reproductive health services.

The client must be told that a reversal of this surgery is possible, but the reversal involves a major surgery and its success cannot be guaranteed.

28.2.3 Informed Consent

Consent for sterilisation operation should not be obtained under coercion or when the client is under physical or mental stress.

Consent should not be obtained when a woman is sedated or when she experiences stress associated with some pregnancy-related events/problems.

Clients must sign a printed application and consent form for sterilisation (Annexure I).

The written consent of spouse is not required for sterilisation.

28.3 FEMALE STERILISATION

Female sterilisation by minilap tubectomy can be performed by a trained MBBS doctor, whereas laparoscopic sterilisation can only be performed either by a gynaecologist with DGO /MD /MS or a surgeon with MS degree and trained in laparoscopy.

Prior to performing sterilisation operation, a careful clinical assessment of the clients should be made to ensure their fitness for surgery. There are certain conditions which require doctors to be cautious, delay the surgery, refer the client to a specially equipped centre, or counsel the client to go in for alternative contraception. There may be situations when it is better to counsel the female client's husband to go in for vasectomy.

28.3.1 Medical Contraindications

Absolute contraindications : None.

Relative contraindications :

- a) Psychiatric disorder
- b) Physical illness
 - Acute febrile illness
 - Jaundice or other chronic liver disease
 - Anaemia with haemoglobin less than 8 gm %
 - Chronic systemic disease, including tuberculosis, bronchial asthma, blood dyscrasias, heart disease, uncontrolled diabetes, hypertension and thyrotoxicosis

- Malignancy
 - Skin conditions, including infection involving operative site
 - Pelvic infection, adhesions or mass
 - Severe nutritional deficiency, such as generalised oedema, anaemia and vitamin deficiency
 - Bleeding disorders
 - Continuing pregnancy
 - Multiple scars of previous laparotomies.
- c) Allergy to local anaesthesia (alternative anaesthesia or procedure must be provided).
- d) Gross obesity
- e) The following conditions apply to post-partum clients:
- Puerperal fever
 - Prolonged rupture of membranes (>24 hrs.)
 - Pre-eclampsia or eclampsia
 - Ante-partum or post-partum haemorrhage resulting in haemoglobin less than 8 gm %
 - Trauma to the genital tract
 - History of post-partum psychosis

The risk of pregnancy must be weighed against the risk of the sterilisation procedure.

28.3.2 Clinical and Technical Procedures

Preparation for surgery includes pre-operative assessment, pre-operative instructions and a review of the surgical procedure and post operative care. This is essential to assess the clients' physical fitness for surgery and also to ensure that the consent for surgery is voluntary and well-informed. Pre- operative assessment can also provide an opportunity for overall health screening and treatment of RTI/STDs.

a) Clinical Assessment and Screening of Clients

Demographic information: The following information is required: age, marital status, occupation, religion, education, number of living children and age of the youngest child.

Medical history:

- History of illness to screen out the diseases mentioned under relative contraindications above.
- Immunisation status of woman for tetanus, and of all children for tetanus, tuberculosis, diphtheria, pertussis. poliomyelitis and measles.
- Addictions (alcohol, smoking and drugs)
- Current medications
- Last contraceptive used
- Menstrual history: Date of last menstrual period and current pregnancy status
- Obstetric history: Number of pregnancies, deliveries (live births and stillborn), abortions (spontaneous and induced), living children of each sex, age of the youngest child.

Physical Examination : Pulse, blood pressure, respiratory rate, temperature, body weight, general condition and nutritional status, auscultation of heart and lungs, examination of abdomen, pelvic examination and other examinations as indicated by the client's medical history or general physical examination

Laboratory Examinations : Blood test for haemoglobin, urine analysis for sugar and albumin and other laboratory examinations as indicated.

b) Final Medical Assessment

The operating surgeon must verify eligibility, informed consent and confirm the physical fitness of the client including abdominal/pelvic examination before conducting the surgery.

c) Timing of the Surgical Procedure

Interval sterilisation should preferably be performed within 7 days after the-menstrual period is over (in the follicular phase of the menstrual cycle). However, if the sterilisation is done in pre-menstrual phase, counselling regarding the possibility of existing conception should be ensured.

Post-partum sterilisation should preferably be done within 48 hours to 7 days of delivery. However, the procedure may be performed at any other time provided there is no infection or contra- indication.

Sterilisation with medical termination of pregnancy (MTP) can be performed concurrently. However, post-MTP tubectomy is not to be done in camp conditions.

Sterilisation following spontaneous abortion can be performed, with antibiotic coverage, only in the absence of anaemia and infection.

Laparoscopic tubal ligation should not be done concurrently with second trimester abortion and in post-partum period

d) Pre-operative Instructions

- The client must bathe and wear clean and loose clothing to the operation theatre (OT).
- The client must not ingest anything by mouth 4 to 6 hours prior to surgery.
- On the morning of surgery, she must empty her bowels, and before entering the OT, empty her bladder.
- The client must remove nail polish, jewellery or hairpins before entering the OT.
- She must also remove her glasses, contact lenses and dentures.
- A responsible adult must be available to accompany the client home after the surgery.

e) Part Preparation

The operating area should not be shaved. The hair can be trimmed, if necessary. The operating area should be cleaned with soap and water and painted with non-alcoholic antiseptic preparation.

f) Anaesthesia/Analgesia/Pre-medication

Local anaesthesia: This is the preferred choice for tubectomy operation.

The following are the requirements for provision of local anaesthesia:

- Skin sensitivity to local anaesthetic agent (lignocaine) is not necessary, as it has no established predictive value for anaphylactic reaction. Most of the reactions of local anaesthesia are due to direct intra-vascular injection.
- 1% lignocaine without adrenaline is the local anaesthetic that is to be infiltrated on the OT table. The maximum dosage is 200 mg or 20 cc of 1 % lignocaine (10 ml of a 2% solution to be diluted with equal amount of distilled water).

- Atropine 0.6 mg (1M) should be given in all cases.
- Pre-operative or intra-operative sedation and analgesia is to be administered, depending on the need. Recommended drugs to be used are given in the following table.

Drugs for preoperative and intra operative sedation and analgesia

Name of drugs	Dose	Route of Administration	Repeat Dose
1. Pentazocine + Phenargan	30 mg + 10 mg	IM	15 mg + 5 mg IV
2. Diazepam	10 mg	IV/IM	5 mg IV
3. Pentazocine + Diazepam	30 mg + 10 mg	IV+ IM	15 mg + 5 mg IV
4. Pethidine + Phenargan	50 mg + 50 mg	IM	10 mg + 5 mg IV

- Atleast 30 minutes must be allowed for prernedication to be effective if given intramuscularly.
- Client must be monitored and attended after administration of the drugs.
- Communication must be maintained with the client throughout the procedure.

General Anaesthesia: This is rarely necessary. However, it may be required in the following conditions:

- In case of a non-co-operative patient
- In case of excess obesity
- History of allergy to local anaesthetic drugs
- Any other medical conditions.

In the above cases the provision for general anaesthesia (including guidelines for personnel, facilities, equipment and others) would be as per the requirements of the trained anaesthetist.

Monitoring: Medical records are to be maintained relating to the vital signs (pulse, respiration and blood pressure), level of consciousness, vomiting and any other relevant information. If any drug is administered, its name, dosage, route and time must be recorded. Monitoring is to be done as given below:

- Pre-operatively - pulse, respiration and blood pressure should be taken prior to pre-medication and thereafter every 15 minutes.
- Intra-operatively - (a) maintain verbal communication with client, (b) check pulse, respiration and blood pressure every 15 minutes.
- Post-operatively - pulse, respiration, and blood pressure are to be monitored and recorded every 15 minutes for one hour following surgery, or longer if the patient is unstable or not awake.

g) Surgical Technique

The tubes are ligated by modified pomerooy's method.

Pomerooy's Method: The fallopian tube is identified and picked up to form a 1-2 cms loop in the isthmic position, 2 to 2.5 cms away from cornu. At the base of the loop, through an avascular area, a No. 0 or 1 chromic catgut suture is passed and base of the loop is ligated on either sides. About 1 cm of loop is excised. When the catgut gets absorbed, the cut end of the tube is separated and thus tubal discontinuity is achieved.

Failure rate : 0.2 to 1 per cent.

General Requirements

- The client's bladder must be empty. If there is a doubt, the client must be asked to void urine immediately before the procedure, and catheterised if indicated.
- The operating surgeon should clearly identify each fallopian tube, following it right up to the fimbria. The site of occlusion of the fallopian tube must always be within 2-3 cm from the uterine cornu in the isthmal portion (this will improve the possibility of reversal, if required in the future). Care must be taken to avoid damage to the blood vessels, ovaries or surrounding tissues.
- Excision of 1 cm of the tube should be done. Use of cautery and crushing of the tube should be avoided.
- The skin incision is to be closed with absorbable or non-absorbable suture and a small dressing or bandage applied.

Minilaparotomy Requirement

It is done during the interval period. Suprapubic mini incision of 2-3 cm is made. The uterus is lifted up with the help of uterine elevator and the cornu is brought underneath the incision. The tube is identified and ligated by modified pomeroiy technique. The process is repeated on the otherside.

- An interval minilaparotomy procedure may benefit from the use of a uterine elevator to bring the fallopian tubes into the operative field.
- The incision for minilaparotomy (interval, post-abortion or post-partum) may be transverse or longitudinal. Its length should not exceed 4 cm.
- Pomeroy procedure should be followed for excision and ligation of tube, using a square knot with 1 '0' chromic catgut.

Laparoscopy Requirement

The laparoscopic sterilization is described briefly. In laparoscopic sterilization, the first step is creation of a pneumo-peritoneum through a Vare's needle utilizing 1-2 liters of CO₂/N₂O/air. Through a small incision 3/4" long made below the umbilicus, trocar is inserted into the peritoneum, Laparoscope is introduced through the trocar. Tube is identified, picked by the prong in its isthmic portion and a loop is pulled inside the laparoscope and Falope ring is slipped at the base of the loop. Then the tube is released. The same procedure is repeated on the other tube. Uterine manipulation is done through the vagina to help visualization of tube. The entire procedure is performed with the woman in lithotomy position with head low.

- To avoid hypoventilation, the patient must not be placed in a Trendelenburg position in excess of 15 degrees.
- A uterine elevator is to be used to visualise the fallopian tube.
- Pneumoperitoneum must not exceed 20 mm of mercury or 1 litre of air or gas (preferably carbon dioxide). Slow insufflation and gradual desufflation should be done.
- The skin incision should not exceed the diameter .of the trocar.
- The trocar is to be angled towards the hollow of the sacrum. The operator must lift the anterior abdominal wall before introducing the trocar.
- Tubal occlusion must always be done with good quality Falope rings (no cautery is to be used). The following precautions are to be followed in applying Falope rings:
 - Draw the tube slowly and smoothly into the sleeve of the laparoscope after proper identification (include only the amount of tube necessary to provide adequate occlusion as mentioned in general requirements (ii) above for appropriate site of occlusion.

- To prevent injury to the mesosalpinx/tube, avoid pulling up or back on the scope or applicator.
- Do not apply the rings in cases of thick, oedematous or fixed tubes. In such cases, tubal occlusion can be done with laparotomy under GA.
- After applying the second ring, the operator should systematically : inspect the pelvis to verify that both tubes are now occluded, there is no unusual bleeding and that there is no visceral injury.
- The operator expels all the gas from the abdominal cavity slowly before removing the trocar.

h) **Post-operative Care**

- The client is monitored as described above.
- The client may be discharged when the following conditions are met:
 - After at least four hours of the procedure, when the vital signs are stable and the client is fully awake, can walk, drink and talk.
 - The client has been seen and evaluated by a doctor. Whenever necessary, the client should be kept overnight.
- The client must be accompanied by some responsible adult while going home.
- For clean surgery, antibiotics are not necessary. However, analgesics, antibiotics and other medications can be provided/prescribed as re- quired.
- The client is to be provided with a discharge card, indicating date and type of surgery, method used, name of institution, date and place of follow-up. Both written and verbal post-operative instructions must be provided in the local language.

i) **Post-operative Instructions**

The client must be advised to

- Return home and rest for the remainder of the day.
- Resume only light work after 48 hours and gradually return to full activity by two weeks following surgery.
- Use medications as instructed.
- Resume a normal diet as soon as possible.
- Keep the incision area clean and dry. Do not disturb or open the dressing.
- Bathe after 24 hours following the surgery. When bathing, to keep the incision area dry. If the dressing becomes wet, it should be changed.
- May have intercourse one week after the surgery, or whenever she feels comfortable after interval sterilisation. Sterilisation procedures do not interfere with sexual pleasure, ability or performance.
- Report to the doctor or clinic if there is excessive pain, fainting, fever, bleeding, or pus discharge from the incision.
- Return to the clinic on the seventh post-operative day for removal of stitches and post-operative check-up.
- Follow the instructions on where to go for routine and emergency follow-up.
- Return to the clinic, if there is missed period/suspected pregnancy.
- If there are any questions, contact the health personnel or doctor at any time.

28.3.3 Follow-up Procedures

- All tubectomy clients should be followed-up by the Female Health Worker within 48 hours after surgery at their home.
- *First follow-up:* Seven days after the surgery at the clinic for stitch- removal/wound examination. Pelvic examination may be done if indicated.
- *Second follow-up:* After one month or after her first menstrual period, whichever is earlier. If she has missed her period or is experiencing any menstrual abnormality, she must be examined to rule out pregnancy.
- *Emergency follow-up:* To be done at any time after surgery.
- *Subsequent follow-up:* If the client develops any complication or has queries.

28.3.4 Complications of Female Sterilisation and their Management

a) Common Intra-Operative Complications

Vaso-vagal attack - Make the OT table horizontal and administer atropine 0.6 mg IV and oxygen.

Respiratory depression or arrest - Keep the airway open; assist breathing using manual resuscitation equipment with oxygen; assess the circulation by monitoring pulse, blood pressure and respiration; steroid and other supportive therapy to be given as indicated.

Cardiac arrest - on confirming cardiac arrest, give an immediate chest, thump and begin external cardiac massage; assist breathing of the patient as described above; cannulate a vein and give appropriate resuscitative drugs; apply external counter-shock if an electrical defibrillator is available.

Uterine perforation due to introduction of uterine elevator from below. This needs to be repaired immediately if there is bleeding; otherwise, these patients need to have further hospital observation to ensure they are stable.

Bleeding from the mesosalpinx - Can be treated through the laparo-scope with cautery or ring/clip application. Alternatively, the bleeding should be controlled immediately by laparotomy.

Injury to urinary bladder - Must be closed in two layers and put self-retaining catheter in the bladder for 7 days or as long as necessary.

Injury to intra-abdominal viscera (i.e., small or large bowel) *and blood vessels* - Must be repaired immediately and maintain I-V line. If the operating surgeon is not confident of repairing, he/she must ask for help from a surgical colleague.

Convulsions and toxic reactions to local anaesthesia - Administer injection of diazepam 5-10 mg IV and oxygen inhalation. Administration of IV fluid is not generally required, but may be given if necessary. Surgery should be stopped and the patient allowed to recover. Further surgery should be performed at a centre with full range of services.

b) Immediate Post-Operative Complications

Wound sepsis - Small stitch abscess is to be treated with drainage and dressings. However, severe sepsis needs opening of the incision and drainage of the pus. Further treatment will be with dressing, antibiotics, and analgesics.

Haematoma in the abdominal wall - A small non-expanding, non-infected haematoma will resolve with no therapy, while a large one, particularly if infected, may need drainage and treatment with antibiotics.

Intestinal obstruction, paralytic ileus, and peritonitis - The client should be hospitalised if she is not already in hospital. Keep the patient on nil orally, put nasogastric suction, IV fluids and give antibiotics and analgesics, as indicated.

Tetanus - A rare complication. If tetanus is detected, the patient must be transferred to a proper centre for treatment immediately.

c) **Delayed Complications**

Menstrual irregularities (for example, menorrhagia, scanty period) sometimes occur but these are not complications of sterilisation. Reassurance and treatment according to the cause is required in most cases.

Chronic pelvic inflammatory disease - It usually presents itself as pelvic pain and requires treatment with bed rest, antibiotics and analgesics.

Incisional hernia - A rare complication that needs surgical repair.

Psychological problems (e.g., depression) - Discussion of the problem, clarification of the role of sterilisation and answering questions are important.

Failure of the operation, leading to pregnancy - This may be due to either technical deficiency in the surgical procedure or spontaneous recanalisation. The patient should be offered MTP or be medically supported throughout the pregnancy. She should be offered repeat surgery, as indicated. Ectopic pregnancy must be ruled out as tubectomy predisposes this condition.

All complications, major or minor, arising during surgery or post-surgery must be reported.

Check Your Progress 1

1) Write True (T) or False (F):

- a) The number of living children is a criteria for deciding the eligibility for the acceptors of sterilisation (T/F)
- b) The female client is eligible for sterilisation between the age 22-25 years. (T/F)
- c) There are no absolute contraindications for sterilisation. (T/F)

2) Fill in the Blanks :

- a) The ideal time for interval sterilisation is.....phase of menstrual cycle.
- b) Post partum sterilisation is best done within.....days following normal delivery.
- c) Pre-operative preparation for sterilisation include nil orally for.....hours prior to surgery.
- d) The occlusion site in female sterilisation procedure is.....portion of fallopion tube.

3) List three complications of female sterilisation during post-operative period.

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28.4 MALE STERILISATION

The male sterilisation procedure, either by conventional or no-scalpel vasectomy, can be performed by a trained MBBS doctor. Prior to performing the sterilisation operation, a careful clinical assessment of the clients must be done to ensure their fitness for the surgery. There are certain conditions which require caution, delay or referral to a specially equipped centre. There may be situations when it is better to counsel the client’s wife for tubectomy.

28.4.1 Medical Contraindications

Absolute contraindications : None.

Relative contraindications :

- a) Psychological disorder.
- b) Physical illness
 - Acute febrile illness
 - Jaundice
 - Severe anaemia
 - Chronic systemic disease, bronchial asthma, blood dyscrasias, heart disease, uncontrolled diabetes, hypertension, and thyrotoxicosis.
 - Bleeding disorder and other blood dyscrasias
 - Severe nutritional deficiency, (hypoproteinaemia and vitamin deficiency).
 - Skin conditions involving the operative site, such as thickening, infection or oedema, make surgery difficult.
 - Local genital conditions, including large varicocoele, hydrocoele, inguinal hernia, filariasis (elephantiasis), cryptorchidism, previous scrotal surgery, intra-scrotal mass.
- c) Allergy to local anaesthesia.
- d) Sexual impairment or sexual problems.

28.4.2 Clinical and Technical Procedures

Preparation for surgery includes pre-operative assessment, pre-operative instructions, a review of the surgical procedure and post-operative care. This is essential to assess the client's physical fitness for surgery and also to ensure that the consent for surgery is voluntary and well-informed. Pre-operative assessment can also provide an opportunity for overall health screening and treatment of RTIs/ STDs.

a) **Clinical Assessment and Screening of Clients**

Demographic Information : The following information is required: age, marital status, occupation, religion, education, number of living children and age of youngest child.

Medical History :

- History of illness to screen out diseases mentioned under relative contraindications.
- Immunisation status of men for tetanus and of all children for tetanus, tuberculosis, diphtheria, pertussis, poliomyelitis and measles.
- Addictions (to alcohol, smoking and drugs).
- Current medications, if any.
- The contraceptive used last by client or his wife.

Physical Examination : Pulse and blood pressure, temperature, general condition and nutritional status, examination of penis, testicles and scrotum. Further examinations, as indicated by the client's medical history.

Laboratory Examinations : Urine analysis for sugar and any other laboratory examination, as indicated.

b) **Final Medical Assessment**

The operating surgeon must verify eligibility, informed consent and confirm the physical fitness of the client for surgery before conducting the surgery.

c) **Timing of the Surgical Procedure**

Can be done at any convenient time on healthy clients with no contraindications.

d) **Pre-operative Instructions**

- The client must trim the pubic, scrotal and perineal hair.
- The client must bathe and wear clean and loose clothes to the OT.
- The client should have a light meal on the morning of the surgery.
- Before entering the OT, he must empty his bladder.

e) **Part Preparation**

It is preferable to trim the hair before operation. The operating area should be cleaned with soap and water and painted with a non-alcoholic antiseptic solution.

f) **Anaesthesia/Analgesia/Pre-medication**

Pre-medication is optional, and is to be administered only in the case of an anxious client in order to allay anxiety and to relax the scrotum. The drug of choice is tablet Diazepam 5 to 10 mg., which should be given 30 minutes before the surgery.

Local Anaesthesia is recommended for vasectomy procedures. The local anaesthetic to be used is 1% lignocaine without adrenaline. The maximum dosage is 200 mg or 20 cc of 1% lignocaine or 10 cc of 2% lignocaine (10 ml solution of 2%, to be diluted with equal amount of distilled water).

- Adequate time must be allowed for medication to be effective.
- Communication must be maintained with the client throughout the operation.

Monitoring : Vasectomy involves a brief surgery. Constant communication with the client will alert the surgeon to any adverse anaesthetic event. However, the staff must be ready to monitor pulse, respiration and blood pressure, and respond to an emergency. A full record of any adverse event must be kept.

g) **Surgical Techniques****Conventional Vasectomy**

Incision - The vasectomy operation is to be performed either with two incisions located just below the root of the scrotum on either side, or with one incision on the midline. The length of each incision should not be more than 2 cm. Smaller incisions will minimise chances of complication.

Site of vasectomy - Midscrotal part of vas should be removed. It must not be cut close to the epididymis, over the convoluted part of vas deference.

Excision of vas - The vas must be separated from tissues and excised in all cases. The portion excised, should not be more than 1 cm. in length. Removal of excess length of vas may make a recanalisation operation difficult, if it is required in future.

Tying of cut ends of vas - The cut ends of the vas must be tied with non-absorbable suture material (preferably 2'0' silk), and the sheath of the vas may be interposed between the two cut ends.

Skin wounds - The skin wound should be closed with non-absorbable sutures and covered with a piece of sterile gauze. Use of tincture of benzoin causes excoriation of the scrotal skin and should therefore be avoided. Before closing the wound, all bleeding points must be tied so as to ensure complete haemostasis and to prevent bleeding or haematoma formation.

Scrotal support - The patient should wear a suspensory bandage for one week, till stitches are removed.

No-scalpel Vasectomy (NSV)

The basic difference in NSV procedure over the conventional technique is in the surgical approach to the vas, which is through a small puncture in the scrotum rather than by a cut with a scalpel. Thereafter, the surgical procedure of vas ligation is the same as in the conventional method. The long-term clinical reports have shown that NSV is less invasive than the conventional technique, causes fewer complications and takes much less time.

Anaesthesia - NSV is performed using local anaesthesia. The preferred anaesthesia is 1% lignocaine without adrenaline. The administration of anaesthesia is done strictly perivasally and this is responsible for the painlessness of the NSV procedure.

Fixation, puncture and delivery of vas - The site of fixation and puncture of the vas will be at the junction of the upper and middle third of the scrotum on the midline. The vas is fixed in the midline at the junction of its upper one-third and lower two-third by a vas fixation forceps. This is done by the three-finger technique. The skin is then punctured with a vas dissection forceps, the vas is dissected out, the bare vas is delivered out of the puncture hole, ligated and excised.

Excision of vas - About 1 cm. length of the bare vas should be ligated and excised. The removal of excessive length of vas may make recanalisation operation difficult, if it is required by the client in future.

Ligature of the vas - The cut ends of the vas should be tied with non- absorbable suture material (2 '0 black silk) and the sheath of the vas should preferably be interposed between the two cut ends.

Delivery of the opposite vas - The opposite vas, should be fixed exactly in the same manner using three-fingers technique at the lower end of the previously made puncture hole. It should be punctured and delivered in the same way through the earlier hole without increasing its size.

Skin wounds - After excision and ligature of both the vasa, inspect the puncture site for any bleeding. If none, the puncture site is dressed with a small gauze. This should be retained for 48 hours. No stitch is applied since the puncture contracts and is nearly invisible after the removal of the instruments.

Scrotal support - The client should wear his normal snugly fitting underwear, or use scrotal support with suspensory bandage.

h) Post-operative Care

- The client should be discharged when the following conditions are met:
 - Thirty minutes have passed after the surgery.
 - The client is alert and ambulatory.
 - The client's vital signs are stable and normal.
 - The client has been seen and evaluated by a doctor.
- Analgesic and other medications if needed must be provided/prescribed prior to sending him home.
- Following vasectomy, the client should wear tight underpants or a loin- cloth to keep the scrotum from moving and subsequent possibility of bleeding and haematoma formation.
- The client is to be provided with a discharge card, indicating date and type of surgery, name of institution and date and place of follow-up. Both verbal and written post - operative instructions should be given in the local language.

i) **Post-operative Instructions**

The client should be told to do the following after discharge:

- Return home and take adequate rest.
- Resume normal work after 48 hours and return to full activity, including cycling, by one week following the surgery.
- Take analgesics (pain killers) and other medicines as advised by the doctor.
- Resume a normal diet as soon as possible.
- Keep the operated area clean and dry and not disturb or open the dressing.
- May bathe after 24 hours with the operated part of the body protected, and in a normal manner 48 hours after the surgery. While bathing, he should keep the operated area dry. If the dressing becomes wet, it should be changed.
- May have intercourse whenever it is comfortable after the surgery. Vasectomy does not interfere with sexual pleasure, ability, or performance.
- The client must be told that he does not become sterile immediately after the operation and that he or his wife will have to use another method of contraception for at least 20 ejaculations or for three months (whichever is earlier) following vasectomy. The client must use condom, if his wife is not using contraception.
- The client should report to the doctor or a clinic if there is excessive pain, fainting, fever, bleeding, increase in scrotal size or pus discharge from the operated site.
- Return to the clinic (in cases of conventional vasectomy) for removal of stitches and post-operative check-up in seven days.
- Report to the clinic for semen analysis after 3 months.
- If there are any questions, contact the health personnel or doctor at any time.
- The client must be provide with instructions on where to go if complications (such as infections, swelling of the scrotum, fever, increase in pain, bleeding from the wound) arise.

28.4.3 Follow-up Procedures

All clients who undergo vasectomy should be visited by a health workers within 48 hours. In NSV cases, the client should also be seen 48 hours after operation.

First follow-up: Seven days after the surgery, the client should go for removal of stitches (in cases of conventional vasectomy), to have the wound examined and to have his questions answered.

Second follow-up: The client should undergo semen analysis after three months.

Emergency follow-up: This can be done at any time after the surgery.

Subsequent follow-up: Required in cases of any complications or questions.

28.4.4 Complications of Male Sterilisation and their Management

a) **Intra-operative Complications**

Although the incidence is rare, the following may be encountered:

Transient drop in blood pressure or dizziness due to vasovagal attack: In such cases, the procedure should be delayed and the patient be allowed to rest. His face should be wiped with cold water and his head lowered. An intra-venous injection of atropine (0.6 mg) may be of assistance in this situation.

Convulsions and reactions to local anaesthesia: In such cases, an injection of diazepam 5-10 mg IV and oxygen inhalation are required. Administration of IV fluids is generally not

needed, but may be done depending on the case. In such an event, surgery should be stopped and the patient allowed to recover. Further surgery should be performed only at a centre with a full range of services.

Injury to testicular artery: This complication is very rare, but if it does occur, first pressure should be used to tamponade both ends of the vessel. Subsequently, both ends of the artery must be ligated.

b) Immediate Post-operative Complications

Swelling of the scrotal tissue, bruising and pain: These short-term minor complications often disappear without treatment within 24 to 48 hours. Ice packs, scrotal support and simple analgesics may provide relief.

Haematoma: If small, it can be treated by scrotal support, analgesics, and antibiotics. A large haematoma may, in addition, need evacuation, antibiotics and further treatment. If a haematoma is detected early, it is desirable to cut the stitches, remove the clots and look for the bleeding or oozing points, which should be tied. Referral should be considered.

Infection:

- Stitch abscess - To be treated with removal of stitch, drainage and dressings.
- Wound sepsis - In case of severe sepsis, the wound should be opened and pus drained. Further treatment should include application of dressings and administration of antibiotics and analgesics.
- Orchitis - Cases must be treated with antibiotics, analgesics, scrotal support and bed rest. Severe orchitis may need hospitalisation.

Tetanus: A rare complication. If tetanus is detected, the patient must be transferred to a proper centre for treatment immediately.

e) Delayed Complications

Sperm granuloma - Can occur either at the site of vas occlusion or over the epididymis. The majority of these are symptomless and respond to analgesics and anti-inflammatory drugs. Very occasionally a persistent and painful granuloma may necessitate surgical intervention.

Psychological problems - Uncommon, but discussion of the problem, clarification of the role of sterilisation and answering questions are important. Appropriate referral should be given to the patient.

Failure of vasectomy - Incidences of failure is quite low, but may occur because of technical deficiencies in the surgical procedure or spontaneous recanalisation. The client's wife should be offered MTP or be medically supported throughout pregnancy. The client should be offered a repeat surgery, as indicated.

There is no association of prostatic or testicular cancer, and cardiovascular disorder with vasectomy

All complications, major or minor, arising during surgery and/or post-surgery must be reported.

Check Your Progress 2

- 1) List three complications of vasectomy in postoperative period.

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2) When does a client become sterile after vasectomy?

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28.5 PHYSICAL REQUIREMENTS

This section gives the standards for institutional setup required for sterilisation procedures.

28.5.1 Physical Facilities

The clinic/facility shall be well-ventilated and flyproof, with a concrete or tile floor that can be cleaned thoroughly.

Running water must be available in the premises.

Electricity supply with a standby generator and other light source must be available.

Adequate space must be provided for the various programme activities.

Separate areas should be earmarked for the following :

Reception

Waiting room

Counselling room which offers privacy and ensures avoidance of any interruptions.

Laboratory with facilities for blood and urine examinations.

Clinical examination room which assures privacy during examination. This room will be used for initial assessment and follow-up.

Pre-operative preparation room for trimming of hair, washing, changing of clothes and pre-medication.

Hand-washing area (an ante-room near the OT for scrubbing) equipped with wash basin having elbow-operated taps.

Sterilisation room (for autoclaving, washing, and cleaning equipment, preparation of sterile packs)— Ideally, this should be near the OT.

Operation theatre— The operation theatre should be isolated and removed from the general thoroughfare of the clinic. It should be large enough to allow operating staff to move freely and to accommodate all the necessary equipment. The lighting in the OT should be adequate. Refer below sub-section 28.6.3 for maintenance and cleaning of OT.

Recovery room or ward— This area must be spacious and well-ventilated. The number of beds will be determined by the available space. This room/ward should be situated adjacent to the OT. The ward should be kept clean.

Adequate toilets— A sufficient number of sanitary-type toilets with running water must be available to clients and staff.

Storage area— There should be a room outside the OT for storage of items.

Office room— It should also be used for keeping records.

28.5.2 Equipment and Supplies

- a) **Examination room requirements**
 - i) Examination table
 - ii) Foot stool
 - iii) Blood pressure apparatus
 - iv) Thermometer
 - v) Stethoscope
 - vi) Examination light
 - vii) Weighing scale
 - viii) Instrument for pelvic examination
- b) **Laboratory**
 - i) Haemoglobinometer and accessories
 - ii) Microscope
 - iii) Red blood cell and white blood cell pipettes
 - iv) Neuber counting chamber
 - v) Apparatus to estimate albumin and sugar in urine
 - vi) Reagents
- c) **Sterilisation room**
 - i) Autoclave
 - ii) Boiler
 - iii) Autoclave drums (bins)
- d) **Cleaning room**
 - i) Hand brushes
 - ii) Heavy-duty gloves
 - iii) Basins
 - iv) Detergent
 - v) Chlorine solution
- e) **Operating theatre**
 - i) Operating table capable of Trendelenburg's position
 - ii) Step-up stool
 - iii) Spot light in OT
 - iv) Instrument trolley
 - v) Minilaparotomy kit
 - vi) Laparoscopy kit
 - vii) Conventional vasectomy kit
 - viii) No-Scalpel Vasectomy kit

- ix) Blood pressure instrument
 - x) Stethoscope
 - xi) Extra syringe with needles (22-G, 1 1/2 in. long)
 - xii) Emergency equipments and drugs
 - xiii) Room heater
 - xiv) IV stand
 - xv) Waste basket
 - xvi) Storage cabinet
 - xvii) Buckets, basins for decontamination
- f) **Recovery room**
- i) Patient cot with mattress, sheet, pillow, pillow cover and blankets
 - ii) B.P. Instrument
 - iii) Stethoscope
 - iv) Thermometers

28.5.3 Emergency Preparedness

- a) **Staff Preparation for Emergencies:** All staff must be trained to effectively manage emergencies. Staff must be skilled in administration of intravenous fluids and drugs. They must understand which drugs may be used, how to administer them and their expected actions. They must be familiar with the use of all emergency equipment and must check all such equipment before each operating session. The person monitoring the client in the operating room and the recovery room must be capable of detecting early signs of complications and be able to take initial emergency action. At least one member of the surgical team must know how to administer cardiopulmonary resuscitation. The emergency care supplies and drugs must be kept in an accessible place known to the staff members.
- b) **Emergency Equipment:** The equipment listed below must be available for emergency use in the operating room and recovery area. All emergency equipment must be immediately available, ready for use and in good condition. A battery-operated light source should be available for back-up or focused illumination of the operative site.

Emergency Equipment and Supplies

- i) Stethoscope
- ii) B.P. Instruments
- iii) Oral airways (two sizes)
- iv) Nasal airways (two sizes)
- v) Suction machine with tubing and two traps
- vi) Ambu bag
- vii) Face mask and tubing and oxygen nipple
- viii) Oxygen cylinder with reducing valve and flow meter
- ix) Blanket
- x) Gauze pieces
- xi) Kidney tray

- xii) Torch (flashlight)
 - xiii) Syringes and needles, including butterfly sets, IV Cannula
 - xiv) Intravenous infusion sets and fluids
 - xv) Adhesive strapping
 - xvi) Sterile laparotomy instruments
- c) **Emergency Drugs:** The drugs listed below must be available in the operating room and recovery area. The staff should be well-informed about the drugs, their use, dose, strength and route of administration, signs of toxicity and treatment of overdose. The following emergency drugs are recommended.

Emergency Drugs (Injectable preparations)

- i) Adrenaline
 - ii) Atropine sulphate
 - iii) Corticosteroids (Dexamethasone or Hydrocortisone)
 - iv) Physostigmine
 - v) Aminophylline
 - vi) Diazepam
 - vii) Pentazocine
 - viii) Sodium Bicarbonate (7.5%)
 - ix) Calcium Chloride
 - x) Frusemide
 - xi) Dopamine
 - xii) Dextrose 5% in water
 - xiii) Dextrose 5% in normal saline
 - xiv) Glucose 25%
 - xv) Ringer Lactate Solution
- d) **Hospital Backup:** For clinics providing sterilisation operation with limited capability for handling emergencies and other complications, it is important to establish a working relationship with nearby back-up medical facilities in the area. This will help clients receive reliable care. The local back-up facilities must include the supplies, equipment and trained staff required to handle complications.

28.6 PREVENTION OF INFECTION

28.6.1 Guiding Principles

It is mandatory to pay meticulous attention to aseptic and antiseptic techniques in all male and female voluntary sterilisation programmes. The incidence of incurable blood-borne viruses such as the human immunodeficiency virus (HIV) and hepatitis B virus (HBV) continues to rise. These viruses can spread unknowingly (symptoms may take years to appear), and it may not be possible to distinguish infected individuals from uninfected ones. Therefore, appropriate infection prevention procedures must be practised at all times with all clients to decrease the risk of transmission. It is important to realise that not only are the clients at the risk of getting infected, but also the staff because of exposure to potentially contaminated blood and other body fluids. The staff includes everyone, from

the doctor to the cleaner. Therefore, proper infection prevention practices, as described below, will decrease the likelihood of infections.

28.6.2 Hand-washing

Hand-washing is vital in preventing infections from spreading. Routine hand-washing is important before and after examining or having any direct contact with a client. Hands should also be washed after removing the gloves as the gloves may have holes or may be torn. Plain or antiseptic soap should be used for routine hand-washing and hands should be *rinsed in a stream of running water*, dried with a clean towel or air-dried. Towels should not be shared, as they get easily contaminated. Micro-organisms can multiply in standing water even when an antiseptic is added. Therefore, practices such as having a common basin where a number of people wash their hands should be avoided.

28.6.3 Facilities (Operation Theatre and Post-operative Ward)

Location and Structure

- OT should be isolated from the part of the clinic that is open to the public.
- It should be enclosed, free of dust and fly-proof.
- The inside of the CT should have tiled walls or concrete floor that can be easily and thoroughly cleaned.
- It should have adequate lighting.
- The windows in the OT should be 1.8 m (6 ft.) above the floor or high enough to prevent cross-ventilation in the operative field.
- The OT should preferably be air-conditioned. When air-conditioning is not possible, pedestal fans may be used.
- The recovery room and post-operative ward should be located adjacent to the OT. The area should be spacious and well ventilated. The number of beds will depend on the available space inside.

Maintenance

- The OT should be locked when not in use, and it should not be used for any other purpose, especially storage of articles.
- The OT should be thoroughly scrubbed and disinfected at least once a week on a non-working day.
- Ideally, operations on infected cases should not be performed in the same OT where sterilisation operation is performed, as the later are classified as a “clean” surgical procedure. If the same OT has to be used, it should be thoroughly cleaned and disinfected preferably after the surgery.

Movement in and Around OT

- The entry of people and their movement inside the OT should be minimised, as the number of micro-organisms are directly related to the number of people and their movement.
- During surgery, keep the door of the OT closed.
- Only the personnel performing/assisting should enter the OT.
- The OT should never be used as a thoroughfare.
- The arrangement within the OT should permit smooth movement of staff.

Cleaning of the OT

a) *Before surgery:*

- Clean the floor with a mop soaked in 0.5% chlorine solution.
- Clean the table/counter top with a cloth soaked in 0.5% chlorine solution.

b) *After surgery*

- Remove the used drape from the operating table and decontaminate it by soaking for 10 minutes in 0.5% chlorine solution.
- Decontaminate all operating room surfaces that come into contact with the patient (such as the table) between procedures by wiping them with 0.5% chlorine solution followed by rinsing with water.
- The operating table, counters/table tops, light handles should be wiped with a detergent and 0.5% chlorine solution.

c) *Weekly cleaning:* Scrub the room with a recommended disinfectant. Washing should be performed from top to bottom.

28.6.4 Processing of Equipment, Instruments and Other Reusable Items

Decontamination and cleaning of equipment, instruments and other items, followed by sterilisation or high-level disinfection can minimise the risk of transmitting infections to both the client and the health service providers. Since disinfection does not reliably destroy all bacterial endospores, instruments and other items used during surgery should be sterilised. When that is not possible, high-level disinfection is the only acceptable alternative for processing instruments and other items for reuse.

Decontamination

Surgical instruments, reusable gloves and other items that have been in contact with blood or other body fluids should be decontaminated prior to cleaning. Immediately after use, these items should be placed in a plastic bucket containing a solution of 0.5% chlorine for 10 minutes. Chlorine rapidly inactivates both HIV and HBV, making the instruments safer for staff to handle during cleaning. After 10 minutes, the items should be removed from the chlorine solution and rinsed with water or cleaned immediately. Soaking instruments for excessive periods of time in chlorine solution may damage them. It is strongly advised that utility gloves are worn during this and subsequent steps. A new chlorine solution should be prepared at the beginning of each day.

Preparation of 0.5 per cent Chlorine Solution

Mix 15 gms. of commercially available bleaching powder (about. one tablespoon full/ three teaspoon full) in one litre of tap water.

The advantages of chlorine is that it is inexpensive, very effective (as it quickly inactivates HIV and HBV) and very useful for decontamination of large surface areas (takes as little as 6 seconds).

Cleaning

- Cleaning is a crucial step in instrument processing and it greatly reduces the number of micro-organisms and endospores on instruments and equipment. Before the equipment is disinfected or sterilised, a thorough mechanical cleaning is necessary to remove blood and organic material.
- After decontamination, the instruments and other items should be scrubbed vigorously with a brush in lukewarm water with detergent to remove all blood, tissue and other residue. Detergent should be used as water alone will not remove proteins or oils.
- Hot water should not be used because it can coagulate protein such as blood, making it hard to remove.
- Soap is not recommended as it can leave a residue.
- The items should then be rinsed thoroughly with water and allowed to air-dry. Items to be high-level disinfected by boiling can be directly placed in a pot of water after cleaning.

High-level Disinfection (HLD)

High-level disinfection is effective in eliminating all micro-organisms (viruses, bacteria, protozoas and fungi) except some bacterial endospores. It is most appropriate for instruments that come in contact with unbroken skin or mucous membranes such as uterine elevators, specula and gloves for pelvic examinations. In addition, HLD is the only acceptable alternative for processing instruments and other items for reuse if sterilisation is not possible. HLD can be achieved either by boiling or by soaking in a chemical depending on the heat-resistant properties of the objects that are to be disinfected.

a) *HLD by Boiling*

- Instruments for HLD must be decontaminated, cleaned with detergent and water prior to boiling.
- Once the water starts boiling, boil for 20 minutes in a pot with a lid.
- Articles must be completely immersed in water.
- Do not add anything to the pot after boiling begins.
- After boiling, remove objects with sterile or previously disinfected forceps.
- Use objects immediately or store them in a covered, dry disinfected container for up to 7 days.

b) *By chemical method*

- After decontaminating, cleaning and drying used objects, soak for 20 minutes in a solution containing 2% glutaraldehyde (e.g. Cidex).
- Thoroughly rinse the objects with boiled water before use.
- Use objects immediately or place them in a covered, dry, disinfected container.

Items should never be kept soaking in water or solutions such as Savlon, spirit, carbolic acid, Cidex etc. Always store BLD items dry.

Sterilisation

Sterilisation eliminates all micro-organisms (bacteria, viruses, fungi and parasites), including bacterial endospores from instruments and other items. Sterilisation is recommended for items that come in contact with the blood stream or tissues beneath the skin. Some of these are reusable needles, syringes and surgical instruments. To be effective, sterilisation must be preceded by decontamination, careful cleaning and thorough rinsing.

Sterilisation can be done by using steam (autoclave) or soaking in a chemical solution.

a) *Steam sterilisation (autoclaving)*

- Always consult specific operating instructions supplied by the manufacturer.
- Decontaminate, clean and dry all instruments that are to be autoclaved.
- Wrap cleaned instruments in cloth or newspaper or place unwrapped instruments in a metal container.
- Arrange wrapped packs in the chamber or drum to allow free circulation of heat or steam to all surfaces.
- Items such as scissors and forceps should be sterilised in the open position.
- Sterilise instruments for the recommended time as shown in box below:

Steam Sterilisation standards		
Time	:	20 minutes for unwrapped and 30 minutes if wrapped instruments and linens and 10 minutes for gloves.
Temperature	:	121°C
Pressure	:	15 l b / sq inch

Sterilised packs are good for one week if kept dry and intact.

b) *Sterilisation by chemical method*

- Decontaminated, cleaned and dried items are put in 2% glutaraldehyde solution (Cidex) for at least 8 to 10 hours.
- Items such as scissors and forceps should to be put into the solution in an open position.
- Do not add or remove any items once timing starts.
- Items should be rinsed well with sterile water (not boiled water), air-dried and stored in a covered sterile container for up to seven days.
- This method is most suitable for endoscopes and plastic cannulas.

Processing Laparoscopes

Surgical laparoscopes are delicate instruments and must be handled with great care. Laparoscopes and accessories should be sterilised or high-level disinfected using the chemical method by soaking in 2% Glutaraldehyde solution, as it does not damage rubber, plastics or lens cements. However, all the steps of decontamination and cleaning must be followed before putting the laparoscopes in chemical solution.

- a) *Decontamination* - Immediately after use, gently wipe the laparoscope, fibre-optic light source and cable and plastic tubing with luer lock using a cloth soaked in 60-90% ethyl or isopropyl alcohol to remove all blood and organic material. As alcohol rapidly kills HBV and HIV, this step protects handlers against possible hepatitis B and AIDS infections.
- b) *Cleaning* - Place the dissembled parts of laparoscope in a basin of clean water. Wash all outer surfaces using a soft cotton cloth. Clean inner channels with a clean brush supplied with laparoscopic kit.
- c) *High-level disinfection* - Put a clean and dried, dissembled equipment in a basin of 2% glutaraldehyde (e.g.Cidex) for 20 minutes. The disinfectant must touch all the surfaces of the laparoscope to be effective. Rinse twice with HLD water (water boiled for 20 mts and cooled) to remove all traces of the disinfectant.
- d) *Sterilisation* - To sterilise, soak the clean and dried, dissembled laparoscope in 2% glutaraldehyde for 8-10 hours. Rinse twice with sterile water to completely remove all traces of the disinfectant and store in a sterile, covered container.

Summary of methods of sterilisation and high-level disinfection for various materials

Material	Method	Duration of Treatment
Linens (drapes, sponges, scrub suits, operating packs, etc.)	Autoclave	121° C at 15 lbs/sq. inch pressure 30 minutes. Should be used within one week.
Rubber goods (gloves, catheters, and rubber tubing)	Autoclave	121°C at 15 lbs/sq. inch pressure for 10 to 15 minutes.
	HLD Boiling	20 minutes

Material	Method	Duration of Treatment	
	Immersing in Chemical solution: Sterilisation - Time Dilution Disinfection (HLD) - Time Dilution	Sporicidin** 6 ³ / ₄ Hours 1 in 5 10 minutes 1 in 16	Cidex 10 Hours None 20 minutes None
Surgical Instruments*	Autoclave	121°C at 15 lbs/sq. inch pressure, 30 mts. for wrapped & 20 mts. for unwrapped items	
	HLD Boilin	20 minutes	
	Immersing in Chemical solution: Sterilisation - Time Dilution Sinfection(HLD) - Time Dilution	Sporicidin** 6 ³ / ₄ Hours 1 in 5 10 minutes 1 in 16	Cidex 10 Hours None 20 minutes None

* Unwrapped surgical instruments are for immediate use. If wrapped, instruments can be used for up to one week.

** If cidex is not available, Sporicidin can be used.

28.6.5 Procedures for Pre-operative Preparation of Clients

Proper pre-operative preparation of the clients is extremely important in sterilisation operations as it helps prevent infection. The following are the procedures that should be followed:

- The client should bathe before surgery, preferably before coming to the clinic or in the clinic. In all the cases, the site of operation should be carefully and thoroughly cleaned with soap and water.
- The client's history of cuts and wounds for the month preceding surgery should be evaluated and he/she should be examined for any infected foci.
- If the client has a local infection, the operation should be postponed and temporary contraception provided.
- Shaving of hair at the operative site should not be done before surgery as bacteria may enter through cuts and nicks, leading to increased potential for post-operative infections. However, if the hair obstruct the operating area, it should be trimmed with scissors just before surgery.
- The clients should preferably change from their street clothes into "theatre clothes before entering the OT. If not feasible, they should at least wear clean clothes.

28.6.6 Procedure of Administering Proper Injection

Proper administration of parenteral injections to the clients can prevent many cases of injection abscesses and transmission of infections such as HIV and HBV. The following guiding principles should be followed:

- Skin area over the injection site should be cleaned and disinfected with povidine (Betadine), savlon, spirit etc.
- Aspirate before injection, the needle should not be touched with spirit cotton, wool swab or any other material.

- After use immediately decontaminate reusable syringes and needles by flushing with 0.5% chlorine solution three times or throw away disposable needles as described below in sub-section 26.6.12.
- Use of multidose vials for injections:
 - A needle must never be used to draw up a solution from the multi dose vial, once it has been used for a client's injection.
 - After a syringe is used for an injection, it must not be used again to withdraw more solution from the vial, even if the needle is changed.
 - Never leave the needle in the vial between uses, as it may lead to contamination of the contents in the vial.
 - Use a fresh, clean, autoclaved or boiled needle and syringe for withdrawing the content from the vial every time.

28.6.7 Surgical Personnel

Guiding Principles

- All the personnel working in the OT must change their shoes before entering.
- For female sterilisations, the personnel must change into theatre clothes (i.e. gowns, caps and masks). For vasectomy procedures that are not done in an OT, medical personnel must at least wear caps, masks and surgical gloves.
- Personnel who have any infection should not enter the OT at all.
- The surgical mask should cover the bridge of the nose at all times
- Movement of the personnel into and out of the OT should be as minimal as possible.
- Personnel in the OT should wear short-sleeved shirt and pyjama, have short and clean fingernails and remove all jewellery.

Surgical Scrub

- The surgeon and his/her assistant must scrub both their hands and forearms up to above the elbow thoroughly with soap and water or antiseptic agents (Annexure II).
- To scrub, the hands should be held above the level of elbows, thoroughly washed up to the elbows with water and antiseptic solution. Clean under fingernails with a small stick or brush. Then, beginning at the fingertips and using a circular motion, the hand and then arm up to the elbow should be vigorously washed. The procedure should be repeated for the other hand. While holding the hands above the elbows, the hands and forearms should be rinsed, fingertips first. The entire procedure should be repeated several times so that the scrub lasts for 3 to 5 minutes. The hands and forearms should be dried with a sterile towel.
- When plain soap is used, it is best to rinse hands with alcohol or rub 3 to 5 ml. of an alcoholglycerine mixture (2 ml. Glycerine in 100 ml alcohol) on the hands until dry. A small stick or a brush should be used for cleaning fingernails and soft brush or cloth used on all surfaces of the hands and forearms.
- Ideally, the surgeon and his/her assistant should scrub thoroughly between each procedure. In high volume settings, this may not be feasible because the skin cannot tolerate the irritation caused by frequent scrubbing. In such settings, the surgical staff should do a three-minute scrub or alcoholic glycerine rub (as mentioned above) every hour or after every five cases (whichever comes first) to prevent recolonisation of the skin by micro-organisms.
- Gloves must be changed in between every case. In case these are torn, a surgical scrub should be done.
- In case the staff leave the OT for any other reason, they should scrub before putting on gloves.

28.6.8 Skin Preparation and Surgical Draping

- The operative site should be prepared immediately pre-operatively with an antiseptic solution, such as an iodophor (Betadine), 60 to 70% solution of ethyl alcohol, chlorhexidine gluconate (Savlon).
- Alcohol preparation should not be applied to the sensitive genitalia. Iodophor and chlorhexidine are safe for use on mucous membranes and can be used to cleanse the vagina and cervix.
- Iodophors require 1 to 2 minutes to work because there must be time for the release of free iodine which inactivates the micro-organisms.
- Antiseptic solutions should be liberally applied at least two times on and around the operative site, which should be thoroughly cleaned by gentle scrubbing.
- The antiseptic solution should be applied in a circular motion, beginning at the site of incision and working out for several inches. This inhibits immediate recontamination of the site with local skin bacteria.
- The excess antiseptic solution should not be permitted to drip and gather beneath the client's body as this may cause irritation.
- After preparing the operative site, the area should be covered with a sterile drape.

28.6.9 Surgical Technique

Good surgical technique that minimises tissue trauma and ensures adequate haemostasis will reduce the occurrence of infection. In vasectomy, haemostasis is critical to help prevent development of scrotal haematomas and the accompanying risk of infection.

28.6.10 Post-operative Care

- After the operative procedure, an ordinary sterile dressing should be applied on the surgical wound.
- The operated site should be kept clean and dry.
- Routine use of prophylactic antibiotics is not necessary.
- The client can take bath usually 24 hours after the surgery, keeping the operation site dry.
- Every client should receive clear, simple instructions for post-operative care, written as well as oral, and in their own language. All clients undergoing vasectomy or tubectomy should be instructed on how to take care of their wound and dressing, what side effects to expect, when to resume normal activities and what to do and where to go in case of complications.

28.6.11 Self-protection of Health Care Providers

Health care providers and other clinic staff (cleaners, laundry & waste disposal staff) run the risk of getting infected with HIV, HBV or other infections while performing various procedures such as surgical operations, injections, wound dressings, deliveries etc. or coming in contact with contaminated materials during cleaning or waste disposal. HIV and HBV viruses are contained in the biological fluids of infected persons and can enter the bloodstream if contaminated fluids come into contact with broken skin or mucous membrane of a healthy person. Therefore, health care providers and other clinic staff are at an increased risk of contacting several infections, particularly HIV and HBV. Precautions for minimising the risk of these infections are based on preventing direct contact with all body fluids. All clients should be seen as potential sources of infections, since often it is not possible to tell who is infected. Therefore, precautions should be applied to all in the following manners:

- Health care providers should protect themselves by using fluid-resistant gowns and gloves during all procedures involving contact with biological fluids. Protective

glasses should be worn in situations where there is a possibility of conjunctival contact.

- Frequent hand washing with soap after examination of each client or after touching instruments and other materials is a very important precaution. It should be followed by all clinical staff at all times. The basic principles are that hands should be washed:
 - Before examining every client and putting on sterile or high-level disinfected gloves
 - After examining every client, handling used objects (e.g. instruments), touching body fluids (blood, secretions) and after removing gloves.
- All used instruments and other objects (e.g. needles, syringes, gloves etc.) should be decontaminated immediately after use by immersing them for 10 minutes in 0.5% chlorine solution before further handling.
- All reusable instruments and materials should be adequately cleaned and properly sterilised or subjected to high-level disinfection.
- Contaminated surfaces like examination couches, operating tables, walls, floors, etc. should be wiped with 0.5% chlorine solution after every procedure.
- Cleaners and other staff working in sluice rooms and laundries should wear protective heavy-duty gloves and gumboots while cleaning and handling other soiled materials and linens.

28.6.12 Disposal of Wastes, Needles and Other Materials

Contaminated wastes are a potential source of infection for staff as well as the local community. Therefore, the wastes should be disposed of properly.

The staff should wear utility gloves when handling and transporting wastes and wash the gloves as well as their hands when finished. Wastes should be buried or burnt. Burning kills micro-organisms and is therefore the best method for disposal of contaminated wastes. The burning should preferably be done in an incinerator or a steel drum .as opposed to open burning. If burning is not possible, wastes should be put in a pit and buried, but never be thrown outside or left in open pits. For wastes that are picked up by the municipality, these should be contained in closed dumpsters prior to removal.

Solid wastes, including dressings and other items contaminated with blood and organic material, should be disposed of in leak-proof, wash- able containers conveniently located in the O. T. /procedure rooms.

Liquid wastes should be poured down in a utility drain or into a toilet or latrine with a flush, otherwise buried. Avoid splashing when disposing of liquid wastes.

Accidental needle stick injuries are mostly self-inflicted and occur either during removal of the needle from the syringe or during cap re- placement. Therefore, for disposable syringes, used needles should not be bent, broken, recapped or removed from the syringe before disposal. Instead, the assembled needle and syringe should be discarded in a puncture-resistant container. If recapping is absolutely necessary, the cap should be held with a clamp while lacing it back over the needle or a one-handed technique should be used (while holding the syringe in one hand, scoop the cap up off a flat surface with the needle and then secure the cap on the needle with the other hand).

Immediately after use, the sharp objects (hypodermic needles, scalpel blades, suture needles) should be disposed of in a puncture-resistant container with a lid made of either metal or heavy, rigid, plastic or cardboard.

The container with sharp objects or needles should be tightly capped, plugged or taped-closed when it is three-quarters full

The containers with needles and sharp objects should be disposed of by burning/burying on site.

Summary of Waste Disposal and Decontamination

- Step I While still wearing gloves, dispose of contaminated waste items (gauze, cotton etc.) by placing these in a leak-proof container (e.g. plastic bag). Put sharp objects into one plastic bucket containing 0.5% chlorine solution and other metal instruments into a second plastic bucket.
- Step II Make sure all objects are completely immersed. Soak for 10 minutes in plastic buckets containing 0.5% chlorine solution.
- Step III Remove the used sheet from the operating table and decontaminate it by soaking for 10 minutes in 0.5% chlorine solution.
- Step IV Decontaminate all operating room surfaces that come into contact with the patient (such as the table) between procedures by wiping them with 0.5% chlorine solution followed by rinsing with water.
- Step V Before removing gloves, immerse hands completely in a bucket containing 0.5% chlorine solution to clean bloodstains. Remove gloves carefully by turning them inside-out and discard disposable gloves in a waste container, or place reusable gloves in 0.5% chlorine solution and soak for 10 minutes.

Check Your Progress 3

- 1) Name two incurable blood borne virus.

- 2) How would you decontaminate the surgical instruments?

- 3) Name three advantages of chlorine solution.

28.7 LET US SUM UP

In this unit you have learnt all about female and male sterilisation. Besides selection of clients, pre and post operative care, complications and management, you also know the scheduling of follow up visits for them. The physical requirements for carrying out these surgical procedures, the list of days and emergency back up have also been provided in this unit. Maintenance of asepsis and antisepsis have been dealt with. You have been provided with the standard consent form recommended by Ministry of Health and Family Welfare, Government of India besides list of kits for various procedures, antiseptic solutions used, sterilisation procedures for instruments and other accessories and waste disposal which will help in your daily practice.

28.8 ANSWERS TO CHECK YOUR PROGRESS

Check Your Progress 1

- 1) a) F
b) T
c) T
- 2) a) proliferative (also known as Follicular phase/Preovulatory phase)
b) 3 - 7
c) 6
d) isthmus
- 3) a) Haematoma in abdominal wall
b) Wound sepsis
c) Peritonitis.

Check Your Progress 2

- 1) a) Haematoma
b) Swelling, bruising and pain in scrotal tissue
c) Wound sepsis and Orchitis
- 2) 3 months or at least 20 ejaculations whichever is earlier.

Check Your Progress 3

- 1) a) Human immunodeficiency virus
b) Hapatits B Virus
- 2) Used surgical instruments are placed in a plastic bucket containing 0.5% chlorine solution for 11 minutes for decontamination.
- 3) a) It is inexpensive and very effective
b) Quickly inactivates HIV, HBV
c) Very useful for decontamination of large surface areas in about 60 seconds.

28.9 FURTHER READINGS

Assiciation for Voluntary Surgical Contraception, 1992. No-Scalpel Vasectomy-An illustrated Guide for Surgeons, New York.

Association for Voluntary Surgical Contraception, 1994. Mini-laparotomy under local Anaesthesia— Service Delivery Guidelines, New York.

Hatcher, RA., *et al.* (1989), *Contraceptive Technology*, International edition. Atlanta: Printed Matter.

Liskht, L., *et al.* (1985), "Minilaparotomy and Laparoscopy; Safe, Effective and Widely Used", *Population Reports Series C*, No.9. Baltimore; Johns Hopkins University, Population Information Program.

Liskin, L., Pile, J.M. and Quillin, W.F., (1983), "Vasectomy: Safe and Simple", *Population Reports Series D*. No.4. Baltimore; Johns Hopkins University, Population Information Program.

- Porter, C. W. (1987), "Prevention of Infection in Voluntary Surgical Contraception", *Biomedical Bulletin* 5, No.2: 1- 7.
- Standards for Female and Male Sterilisation Ministry of Health & Family Welfare, Govt. of India, New Delhi, 1999.
- Tietjen, I., Cronin, W., McIntosh, N. (1992), "Infection Prevention for Family Planning Service Programs—A Problem Solving Reference Manual", *Essential Medical Information, Systems*. Inc.
- World Federation of Health Agencies for the Advancement of Voluntary Surgical Contraception (1988), *Safe and Voluntary Surgical Contraception. Guidelines for Service Programs*, New York.
- World Health Organization (1988), *Technical and Managerial Guidelines for Vasectomy Services*, Geneva.

Application and Informed Consent for Sterilisation Operation

Name of Client Shri/Smt _____

Address of Client _____

Spouse's name Shri/Smt _____

Father's name Shri _____

Operating Centre _____

Dear Doctor,

Please arrange to have me sterilised. My age is _____ and my spouse's age is _____

I am/was married. I/We have _____ male and _____ female living children. The age of the youngest child is _____ years.

- The decision to undergo the sterilisation operation has been taken independently by me without any outside pressure, inducement, or force.
- I am aware that other methods of contraception are available to me which have been properly explained.
- The eligibility criteria for the operation have been explained to me, and I affirm that I am eligible to undergo the operation according to the criteria.
- I know that for all practical purpose this operation is permanent and that, after the operation I will be unable to have any more children.
- I also know that there are still some chances of failure of the operation, for which the hospital/institution and operating doctor will not be held responsible by me or my relatives or any other person whomsoever. I will report to the centre/doctor if there is any missed menstrual cycle of mine/my spouse within two weeks.
- My spouse has not been sterilised previously.
- I am aware that I have the option to decide against the sterilisation procedure at any time without sacrificing my rights to other reproductive health services.
- I am aware that I am undergoing an operation which carries an element of risk.
- I agree to come for follow-up to the centre/doctor as instructed, failing which I shall be responsible for consequences, if any.
- I agree to undergo the operation under any type of anaesthesia which the doctors think suitable for me and to be given other medicines as considered appropriate by the doctors concerned.

The above information has been read/read out and explained to me, in my own language.

* Witness can be any person not associated with the Service Centre.

Applicable to the cases where the client can not read and the above information is read out.

1. The client has been fully counselled about various available methods of contraception and the above method.

 Signature of Counsellor**
 Name and Full Address

2. I certify that I have satisfied myself that Shri/Smt _____ is within the eligible age-group and is mentally and medically fit for a sterilisation operation. There is no evidence that he/she has undergone a sterilisation operation previously). I have explained all clauses to the client and that this form has the authority of a legal document.

 Signature of Operating doctor
 (name and address)

 Signature of medical officer
 (name and address)

DENIAL OF STERILISATION

I certify that Shri/Smt _____ is not a suitable client for re sterilisation/ sterilisation for the following reasons:

- 1.
- 2.

He/She has been provided the following alternative methods of contraception.

 Signature of counsellor ** or
 Doctor making decision
 (name and address)

** Counsellor can be any health personnel including doctor.

Family Planning

Dear learner,

While going through this block, you might have found certain portions of the text to be difficult to comprehend and some scope to improve them. We wish to know your difficulties and suggestions in order to improve the quality of the course. We, therefore, request you to fill up and send us the following questionnaire, which pertains to this block. If you find the space provided insufficient, kindly use a separate sheet.

Please mail the filled in questionnaire to: **Programme Coordinator, PGDMCH Programme, School of Health Sciences, IGNOU, Maidan Garhi, New Delhi-110 068.**

Questionnaire

Enrolment No.

Section A: Unit Specific Comments

Unit 24: Counselling

1. How many hours did you need to study this unit?.....
2. Please grade the unit on the following items by putting a tick (√) mark:

Item	Grade				
	Excellent	Very Good	Good	Satisfactory	Poor
Presentation Quality					
Language and Style					
Illustrations (Diagram, Tables etc.)					
Conceptual Clarity					
Check Your Progress Questions					
Answers to Check Your Progress					

3. Do you find all the sections to be relevant for this course?
If not, please list the section/sub-section.

.....
.....

Unit 25: Conventional Contraceptive Methods

1. How many hours did you need to study this unit?
2. Please grade the unit on the following items by putting a tick (√) mark:

Item	Grade				
	Excellent	Very Good	Good	Satisfactory	Poor
Presentation Quality					
Language and Style					
Illustrations (Diagram, Tables etc.)					
Conceptual Clarity					
Check Your Progress Questions					
Answers to Check Your Progress					

3. Do you find all the sections to be relevant for this course?
If not, please list the section/sub-section.

.....
.....

Unit 26: Hormonal Contraception



1. How many hours did you need to study this unit?
2. Please grade the unit on the following items by putting a tick (✓) mark:

Item	Grade				
	Excellent	Very Good	Good	Satisfactory	Poor
Presentation Quality					
Language and Style					
Illustrations (Diagram, Tables etc.)					
Conceptual Clarity					
Check Your Progress Questions					
Answers to Check Your Progress					

3. Do you find all the sections to be relevant for this course?
If not, please list the section/sub-section.

.....
.....

Unit 27: Intra Uterine Contraceptive Devices

1. How many hours did you need to study this unit?
2. Please grade the unit on the following items by putting a tick (✓) mark:

Item	Grade				
	Excellent	Very Good	Good	Satisfactory	Poor
Presentation Quality					
Language and Style					
Illustrations (Diagram, Tables etc.)					
Conceptual Clarity					
Check Your Progress Questions					
Answers to Check Your Progress					

3. Do you find all the sections to be relevant for this course?
If not, please list the section/sub-section.

.....
.....



Unit 28: Surgical Methods

1. How many hours did you need to study this unit?
2. Please grade the unit on the following items by putting a tick (✓) mark:

Item	Grade				
	Excellent	Very Good	Good	Satisfactory	Poor
Presentation Quality					
Language and Style					
Illustrations (Diagram, Tables etc.)					
Conceptual Clarity					
Check Your Progress Questions					
Answers to Check Your Progress					

3. Do you find all the sections to be relevant for this course?
If not, please list the section/sub-section.

.....
.....

Section B: Block Specific Comments

1. List the subject areas of relevance to Maternity and Child Health that you feel should have been incorporated in this block.

.....
.....

2. Any other suggestions:

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.....
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