

## Reproduction, fertility and infertility NCLEX Review

### Health Promotion and Maintenance

### Reproduction, Fertility and Family planning

#### I. Reproductive System

##### A. Female Reproductive Structures

###### 1. Ovaries

- Form and expel ova
- Secrete estrogen and progesterone

###### 1. Fallopian tubes

- Muscular tubes (oviducts) lying near the ovaries and connected to the uterus
- Tubes that propel the ova from the ovaries to the uterus]

###### 1. Uterus

- Muscular, pear-shaped cavity in which the fetus develops
- Cavity from which menstruation occurs

###### 1. Cervix

- The internal OS of the cervix opens into the body of the uterine cavity.
- The cervical canal is located between the internal OS and the external OS.
- The external cervical os opens into the vagina.

###### 1. Vagina

- Muscular tube that extends from the cervix to the vaginal opening in the perineum
- Known as the birth canal
- Passageway for menstrual blood flow, for penis for intercourse, and for the fetus

##### B. Male Reproductive Structures

## 1. Penis

- Structures include the body or shaft, glans penis, and urethra.
- Primary functions include pathway for urination and the organ used for intercourse.

## 1. Scrotum

- Structures include the testes, epididymis, and vas deferens.
- Normal temperature is slightly cooler than body temperature.

## 1. Prostate gland

- Secretes a milky alkaline fluid
- Enhances sperm movement and neutralizes acidic vaginal secretions

## II. Menstrual Cycle

Four body structures involved in the physiology of the menstrual cycle:

- Hypothalamus (secretes GnRH-Gonadotropin Releasing Hormones: either FSH-RH or LH-RH)

FSH-RH: Follicle stimulating hormone-releasing hormone

LH-RH: Luteinizing hormone-releasing hormone

- Pituitary gland (secretes Gonadotropic hormones: either FSH or LH)

FSH: Follicle Stimulating Hormone

LH: Luteinizing Hormone

- ovaries (where estrogen or progesterone is produced)
- Uterus/cervix

### 1. Follicular Phase

Day 1 (onset of menses)

Day 1-3 (Menstruation)

Day 4 or Day 5 (immediately after the menstruation)

? Estrogen and Progesterone = very low

? Endometrium is very thin

? Cervical Mucus is at its lowest

- Hypothalamus releases GnRH (FSH-RH) in response to estrogen level
- Under the influence of GNRH (FSH-RH), Anterior Pituitary Gland produces FSH
- FSH travels into the ovaries and activates one of the primordial follicles to begin to grow and develop -- Graafian follicle.
- Graafian Follicle produces a clear fluid that contain high amount of Estrogen \*\*\*
- \*Endometrium begins to proliferate, more mucus will be present (Mucus: yellow, cloudy or white in color and sticky to touch)
- Estrogen at its peak=

? turns off the production of FSH-RH by hypothalamus, and turned off the production of FSH by APG

? Production of Clear Fertile Mucus (entering the fertile window)

? turns on production of LH-RH by the hypothalamus, LH-RH trigger APG to secrete LH

- LH travels to the ovary and triggers Graafian follicle to burst open and release an egg.
- Ovulation occurs (DAY 14)

-cervical mucus is more abundant, thinner, and becomes stretchy.

## 1. Luteal Phase

-Once it releases egg, the empty follicle develops into a new structure called the Corpus Luteum

- Corpus Luteum secretes progesterone

´ prepares uterus for implantation

´ Glands of the endometrium to become corkscrew or twisted

´ capillaries of the endometrium increase in amount (rich and spongy)

## DAY 22

- If fertilization does not occur, the corpus luteum begins to regress
- Production of estrogen and progesterone decreases
- Quantity of cervical mucus declines

**DAY 24 or 25**

- Endometrium begins to degenerate
- capillaries rupture
- Endometrium sloughs off and passes out the cervix
- Menstruation

Legend:

Gray – Proliferative phase

Blue – Secretory phase

Green – Ischemic phase

Red – Menstrual phase

**II. Nursing Care of the Infertile Couple****A. Key terms**

Subfertility - pregnancy has not occurred after at least 1 year of engaging in unprotected coitus

Primary subfertility - there have been no previous conceptions

Secondary subfertility - there has been a previous viable pregnancy, but the couple is unable to conceive at present.

Sterility - inability to conceive because of a known condition, such as the absence of a uterus.

**B. Female Sub-fertility Factors**

- Anovulation (absence of ovulation)
- Tubal Transport Problems
- Uterine Problems
- Cervical Problems
- Vaginal Problems

**C. Male Sub-fertility Factors**

- Inadequate Sperm Count

The minimum sperm count considered normal is 20 million per milliliter of seminal fluid, or 50 million per ejaculation. At least 50% of sperm should be motile, and 30% should be normal in shape and form.

- Obstruction or Impaired Sperm Motility
- Ejaculation Problems

## D. Fertility Assessment/Common Diagnostic Studies

### A. Female

#### 1. Basal body temperature (BBT), or resting body temperature

- is obtained by the woman taking her oral temperature each day prior to arising from bed and graphing the results on a month-long graph; a sudden dip occurs the day prior to ovulation and is followed by a rise of 0.5 to 1.0°F, which indicates ovulation; this rise will remain until menstruation begins

1. Serum hormone testing: venous blood is drawn to assess levels of FSH and LH in infertile women, which are indicators of ovarian function
2. Post-coital exam

- couple is instructed to have intercourse 8 to 12 hours prior to the exam, 1 or 2 days before expected ovulation

- a 10-cc syringe with catheter attached is used to collect a specimen of secretions from the vagina

- secretions are examined for signs of infection, number of active and non-motile spermatozoa, sperm-mucus interaction, and consistency of cervical mucus

#### 1. Endometrial biopsy (obtaining an endometrial tissue sample for examination)

### Pre-procedure care:

? assisting the client (after undressing below the waist) onto the exam table with feet in stirrups

? advising the client that she will feel crampy discomfort both during paracervical block administration and during the aspiration

### Post-procedure care:

? providing sanitary napkins for the client as vaginal bleeding will occur

? assessing the client for a vasovagal response (sudden fainting caused by hypotension induced by vagal nerve stimulation) prior to arising from the exam table

#### 1. Hysterosalpingogram (HSG)/Uterosalpingogram detects uterine anomalies - a radiologic

examination of the fallopian tubes using a radiopaque medium - scheduled immediately after a menstrual flow

2. Laparoscopy

- used to visualize the structures in the pelvis or perform surgical procedures

B.MALES:

1. Semen analysis: the client ejaculates into a specimen container, and the ejaculate is examined microscopically for the number, morphology, and motility of sperm

	Factor	Value
Normal semen analysis result	Volume pH	> 2.0 mL 7.0 to 8.0
	Total Sperm Count Motility	> 20 million per mL 50 % or greater
	Normal Forms	50 % or greater

C. Infertility Management:

- Correction of the Underlying Problem

1. Increasing Sperm Count and Motility

Reason 1: Oligospermia

- Abstinence for 7 to 10 days at a time to increase the count
- Ligation of a varicocele (if present)
- changes in lifestyle

Reason 2: Vas Deferens blockage

- Sperm can be extracted by syringe and used for intrauterine insemination

Reason 3: Immobilization by Immunologic Factor

- abstinence or condom use for about 6 months - sperm washing and intrauterine insemination
- administration of corticosteroid to the woman

1. Reducing the Presence of Infection

- Infection is treated based on causative agent
- Close supervision and follow-up

- Drug of Choice trichomonal infection: metronidazole (Flagyl)

## 1. Hormone Therapy

### Reason 1: Disturbance in Ovulation

- GnRH administration
- Clomiphene citrate (Clomid, Serophene)
- human menopausal gonadotropins (Pergonal), combinations of FSH and LH with administration of human chorionic gonadotropin (hCG)
- bromocriptine (Parlodel)
- reduce prolactin levels and allow for the rise of gonadotropins

### Reason 2: Inadequate and Poor Vaginal Secretions

- Conjugated estrogen (Premarin), low dose estrogen therapy: during days 5 to 10 of cycle

### Reason 3: Luteal-phase defect

- progesterone vaginal suppositories, first dose: on the third day of the temperature rise and continued for the next 6 weeks (if pregnancy occurs) or until a menstrual flow begins.

## D. Assisted Reproductive Techniques

### 1. Therapeutic Insemination

- instillation of sperm into the female reproductive tract to aid conception through intracervical insemination or intrauterine insemination

Used when:

? man has an inadequate sperm count

? a woman has a vaginal or cervical factor that interferes with sperm motility

Pre-procedure:

- Fertility Awareness to predict ovulation
- On the day after ovulation, the procedure is done
  - therapeutic insemination takes an average of 6 months to achieve conception

### 1. In Vitro Fertilization

- multiple ova are harvested via a large-bore needle and syringe transvaginally under ultrasound guidance; the ova are then mixed with spermatozoa, and up to 4 of the resultant embryos are returned to the uterus 2 to 3 days later; extra embryos can be frozen for implantation at a later date; side effects include cysts on the ovaries, multiple births related to multiple embryos, and ovarian hyperstimulation

#### Pre-procedure:

- synthetic FSH injections SQ (abdomen, thigh or upper arm) to stimulate the ovary to produce multiple ova for 5 to 6 days prior to procedure
- sedation during ova retrieval procedure
- Monitor the client for about 2 hours after egg retrieval
- instructing the woman to limit activity for the next 24 hours

#### Post-procedure:

- instructing the client to have minimal activity for 24 hours - progesterone supplementation
  1. Gamete intrafallopian transfer (GIFT)
- harvested ova and sperm are mixed and placed via large bore needle and syringe under ultrasound guidance into the ovarian end of the fallopian tube
  1. Zygote intrafallopian transfer (ZIFT)
- ova fertilized in vitro are placed into the fallopian tube via large-bore needle and syringe under ultrasound guidance; performed 18 to 24 hours after egg retrieval.

### III. Overview of Family Planning and Contraception

Goal of family planning: to assist clients with reproductive decision-making, enabling the client to have control in preventing pregnancy, limiting the number of children, spacing the time between children, and voluntarily interrupting pregnancy as desired.

BRAIDED may be useful when counseling a client about family planning methods:

B- Benefits: information about advantages

R- Risks: information about disadvantages

A- Alternatives: information about other methods available

I- Inquiries: opportunity for the client to ask

D- Decisions: opportunity for the client to decide or change mind

E- Explanations: information about the selected method and how to use it

D- Documentation: information given and client's understanding of the information

## **A. Natural Methods of Planning and Contraception**

Natural methods: safe, situational methods requiring increased self-awareness and self-control to be effective

### **Types of Natural Family Planning methods:**

1. Abstinence is the practice of avoiding sexual intercourse

#### **a. Advantages**

? safe, free, and available to all clients

? 100% effective in preventing pregnancy and sexually transmitted infections when consistently practiced

? Can be initiated at any time

? Encourages communication between partners

b. Disadvantage: both participants must practice self-control

Client education

? Teach alternative methods of obtaining sexual pleasure

? Provide positive feedback to clients who desire and maintenance abstinence

1. Coitus interruptus (withdrawal)

a. Coitus interruptus requires the male to withdraw the penis from the female's vagina when urge to ejaculate occurs and ejaculate away from the external female genitalia

#### **C. Advantages**

1. can be practiced at any time during menstrual cycle

2. Free

#### **D. Disadvantages**

1. One of the oldest but least reliable contraceptive method; 80% effective with typical use

2. Some pre-ejaculatory fluid contains sperm, which can lead to pregnancy

3. exercising self-control may be difficult

## B. Fertility Awareness Methods of Family Planning and Contraception

? based on understanding of the woman's ovulation cycle and the timing of sexual intercourse

### 1. Calendar (Rhythm) Method

Client education

a. Teach the woman to maintain a menstrual calendar for 6-8 months to identify the shortest and longest cycles

b. With the first day of menstruation as the first day of cycle, calculate the fertile period by subtracting 18 days from the length of the shortest cycle through the length of the longest cycle minus 11 days

c. Counsel the woman to avoid intercourse during fertile period

### 1. Basal Body Temperature (BBT) Method

- Based on the thermal shift in menstrual cycle, the temperature drops just prior to ovulation, rises and fluctuates at a higher level until 2-4 days prior to the next menses, then falls if no conception

Client Education:

? Instruct the woman to take her temperature with a basal body thermometer, which shows tenths of a degree, and record the findings on a temperature chart; each morning prior to getting out of bed or beginning activity

? Counsel the client to avoid intercourse on the day the temperature drops and for 3 days thereafter

? Inform the client that reliability of the method can be affected by:

- A decrease in the BBT that is too small to detect
- Factors that may rise or lower the BBT
- Intercourse just prior to the drop in the temperature may result in pregnancy

### 1. Cervical Mucus Method

- Also known as the ovulation or Billings Method, this method is based on the cervical mucus changes that occur during menstrual cycle

Client education

a. Teach the woman to assess her cervical mucus daily for the amount, color, consistency and viscosity

b. counsel the woman to avoid intercourse when she first notices the cervical mucus becoming clear, elastic and slippery for about 4 days

c. Convey sensitivity as women who are uncomfortable touching their genitals may find this method unacceptable

d. Instruct the client that cervical mucus can be affected by:

- Douches and vaginal deodorants
- Semen
- Blood and discharge from vaginal infection
- Contraceptive gels, foams, film or suppositories
- Antihistamine drugs

## 1. Symptothermal method

- incorporates the assessment of multiple indicators of ovulation, recording findings and coital history on a menstrual calendar, then abstaining to intercourse during the fertile period

Client Education:

a. Instruct the client to assess and record the primary indicators of ovulation

1) Basal Body Temperature

2) Cervical Mucus

b. Teach the client to become self-aware of and record secondary indicators of ovulation

- Increased libido
- Abdominal bloating
- Mittelschmerz: mid-cycle abdominal pain - Breast and pelvic tenderness
- Pelvic and vulvar fullness
- Slight dilatation of cervical os
- Softer cervix located higher in the vagina

c. Counsel the client to avoid unprotected sexual intercourse during fertile period

d. Teach the client that this method provides no protection against sexually transmitted infections

## C. Mechanical Methods of Family Planning

### 1. Male Condom

- a latex rubber or synthetic sheath that is placed over the erect penis before coitus to trap sperm

#### Side Effects and Contraindications

- sensitivity to latex

#### Important Health education:

- condoms must be applied before any penile-vulvar contact
- A condom should be positioned so that it is loose enough at the penis tip to collect the ejaculate without placing undue pressure on the condom.
- The penis (with the condom held carefully in place) must be withdrawn before it begins to become flaccid after ejaculation

### 1. Female Condoms

- thin, polyurethane sheath with flexible rings at each end, which covers the cervix, lines the vagina, and partially shields the perineum
- may be inserted up to 8 hours before intercourse

### 1. Spermicide

- an agent that causes the death of spermatozoa before they can enter the cervix.
- available in a variety of forms including creams, gels, melting suppositories, foaming tablets, aerosol foams, and vaginal contraceptive film
- The most common spermicidal agents are nonoxynol-9 and octoxynol9

Note: Contraceptive foams, creams and gels: effective immediately

Vaginal contraceptive film and suppositories: effective 15 minutes after insertion

### 1. Diaphragm

- a circular rubber disk that is placed over the cervix before intercourse

#### Client Education:

- a. Teach the client to insert and remove the diaphragm

- Apply about a teaspoon of spermicidal cream or jelly around rim and inside the cup
- Squeeze the sides of the diaphragm together, insert through the vagina, and place the side
- Remove the diaphragm by grasping the rim to dislodge from the cervix and pull down to remove through the vagina

b. diaphragm remains effective if inserted up to 4 hours before sexual intercourse and should be left in place 6 hours after coitus

c. if the diaphragm is placed more than 4 hours prior to intercourse or coitus is desired again within 6 hours, a condom use or additional spermicidal without disturbing the diaphragm

d. It may be left in place for as long as 24 hours

e. must be fitted by a qualified healthcare provider and replaced: once a year

f. Refitting or replacement: following pregnancy or a 15-lb weight gain or loss

## 1. Cervical Cap

- soft rubber are shaped like a thimble with a thin rim, and fit snugly over the uterine cervix
- Effectiveness is influenced by the childbearing history of the woman
- insert the cap at least 20 minutes but no longer than 4 hours prior to intercourse - cervical cap may be left in place up to 48 hours
- cervical cap must be fit by a qualified healthcare provider and should be replaced annually
- Clients will need to be rechecked or fit following pregnancy or a 15-lb weight gain or loss; effectiveness is reduced for parous woman

## 1. Contraceptive Sponge

- small, round polyurethane sponge containing nonoxynol-9 spermicide
- Moisten the sponge with water prior to insertion to activate the spermicide - provides protection up to 24 hours and for repeated acts of intercourse
- Leaving the sponge in place for more than 24-30 hours should be avoided

## 1. Intrauterine device (IUD)

- small object that is inserted into the uterus through the vagina
- An IUD must be fitted by a physician, nurse practitioner, or nurse-midwife, who first performs a Pap test and pelvic examination.

Two common types of IUDs used in the United States

## a. Copper T380 (ParaGard)

- T-shaped plastic device wound with copper

## b. LNG-IUS (Mirena)/Progesterone T (Progestasert)

- holds a drug reservoir of progesterone in the stem

### Client Education

- A woman may notice some spotting or uterine cramping the first 2 or 3 weeks after IUD insertion
- heavier than usual menstrual flow for 2 or 3 months and experience more dysmenorrhea: Ibuprofen, a prostaglandin inhibitor, is helpful in relieving the pain

### Contraindications:

- women with an increased risk of contracting STI, i.e. those who have multiple sexual partners
- women who have never been pregnant
- who have a history of having had PID
- woman whose uterus is distorted in shape
- severe dysmenorrhea (painful menstruation), menorrhagia (bleeding between menstrual periods), or a history of ectopic (tubal) pregnancy
- Women with valvular heart disease • women with anemia

Note: Instruct the woman to check for the presence of the string protruding through the cervix by inserting a finger into the vagina once a week for the first month and then after each menstruation

## D. Hormonal methods of Family Planning and Contraception

### 1. Oral Contraceptives (birth control pills):

Act by inhibiting the release of an ovum, blocking the cyclical release of gonadotropin-releasing hormone, and changing cervical mucus

### Types of oral contraceptives

- Combined oral contraceptives contain both estrogen and progestin and are available in 21-day and 28-day packages; effectiveness with perfect use is 99.1%; typical use effectiveness is 95%
- The progestin-only pill, also known as the mini-pill, does not contain estrogen, containing less progestin than combination pills, and may be used by lactating women, women with mild hypertension, and those who experienced side-effects from oral contraceptives containing estrogen; effectiveness with perfect use is 95.5%; typical use effectiveness is 95%

### 1. Client Education

- a. When starting oral contraceptives, instruct the client to begin pills on the first Sunday after the onset of the menstrual period and take one pill at the same time each day
- b. If a 28-day pack is prescribed or the client is taking progestin-only pills, advise the client not to skip days between packages
- c. Clients using a 21-day pack should wait 7 days before starting the next cycle of pills
- d. Instruct the client what to do if progestin-only oral contraceptives are missed:
  - If the client misses one pill at any time during the cycle, the missed pill should be taken immediately, and the next pill taken at the regular time
  - Any time a pill is missed, the client should use an additional method of contraception through the end of that cycle
- e. Instruct the client what to do if combination oral contraceptives are missed.
  - If one pill is missed at any time during the cycle, the client should take the missed pill immediately, the next pill at regular time, and no back-up method is needed
  - If two pills are missed during the first 2 weeks, the client is advised to take two pills for the next 2 days and resume taking pills on the regular schedule
  - If two pills are missed during the third week, the client is advised to take one pill daily until Sunday, then begin a new pack on Sunday without missing any days
  - If three or more pills are missed at any time, the client is advised to take one pill daily until Sunday, and then begin a new pack on Sunday without missing any days.
  - If two or more pills are missed at any time, a back-up method should be used for 1 week or emergency contraception considered, if unprotected intercourse occurs
- f. Observe for side-effects of oral contraceptives, which can be estrogen-related (such as thromboembolic disease, headache, fluid retention and nausea) or progestin-related (including acne, increased HDL cholesterol level, depression and hirsutism)

## Contraindications

- a. Combined oral contraceptives should not be taken by women with a history of thromboembolic or cardiovascular disorders, breast cancer or estrogen-dependent neoplasms
- b. Combined oral contraceptive should not be taken if the woman is currently pregnant, lactating of less than 6-week duration, smokes more than 20 cigarettes/day and is more than 35 years old, has headaches with focal neurological symptoms, experiencing prolonged immobility or surgery on the legs, or hypertension of more than 60/100 or diabetes mellitus of 20 or more years duration with vascular disease

### 1. Subdermal implants

- Consists of six silastic capsules containing levonorgestrel, a progestin, implanted sub-dermally into woman's upper inner arm during the first 7 days of the menstrual cycle
- Act by preventing ovulation and stimulating production of thick cervical mucus, which prevents penetration of sperm

## Client Education

1. Inform the client of possible side-effects such as spotting, irregular bleeding, amenorrhea, weight gain, headache, fluid retention, mood changes, and depression
2. Provide client with information regarding signs and symptoms of infection indicating the need for post-procedure follow-up
3. Long Acting Progestin Injections

- contains medroxyprogesterone acetate (Depo-Provera) 150mg, a long-acting progestin that blocks the luteinizing hormone surge, prevents pregnancy by suppressing an ovulation, and thickens the cervical mucus to prevent penetration of sperm with a perfect and typical use effectiveness of 97.7%

## Client Education

1. Inform the client of potential side-effects such as menstrual irregularities, headache, weight gain, breast tenderness, and depression
2. Teach the importance of following the 3month injection regimen to maintain contraceptive effects; subsequent dose must be given 80-90 days after the previous dose for continuous contraceptive protection

## E. Surgical Methods of Contraception

### 1. Vasectomy

- the vas deferens is resected through small incisions made in each side of the scrotum resulting in blockage of the passage of sperm

## Client education

1. The procedure takes about 1 to 20 minutes and can be performed in a clinic setting under local anesthesia
2. The client should refrain from driving immediately after the procedure and be discharged to someone who can drive and remain with the client for 24 hours after the procedure
3. Rest with minimal activity should be encouraged for 48 hours d. Tub baths should be avoided for 48 hours
4. A scrotal support should be worn to increase comfort
5. Ice packs should be used intermittently to minimize discomfort and swelling g. Sitz baths can be used after 48 hours
6. Strenuous activity should be avoided for 1 week
7. Sterility is not achieved until the semen is free of sperm, about 4 to 6 weeks or 6 to 36 ejaculations; until then, another contraceptive method should be used during this time
8. Two or three semen samples should be analyzed to verify sterility prior to resuming

unprotected intercourse

9. Semen should be rechecked at 6 and 12 months to verify sterility has been maintained

10. Tubal ligation

- the fallopian tubes are accessed through two small incisions into the abdomen and visualized using a laparoscope, then cut, tied, cauterized, or banded to block the passage of sperm and prevent the ovum from becoming fertilized
- Effectiveness ranges from 99.2 to 96.3 percent depending on the method used; younger women have been reported to experience higher failure rates

#### Client education

1. The procedure takes approximately 30 minutes and is performed under general or local anesthesia
2. The client may be asked to restrict food and fluid intake for several hours prior to the procedure, especially if general anesthesia is planned
3. Pain may be experienced for several days after the procedure
4. Tub baths should be avoided for 48 hours
5. Avoid driving, lifting and strenuous activity for 1 week