THE MENSTRUAL CYCLE and ITS RELATION TO CONTRACEPTIVE METHODS

A Reference for Reproductive Health Trainers

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LIST OF ABBREVIATIONS

AIDS	acquired immune deficiency syndrome
BBT	basal body temperature
CIC	combined injectable contraceptive
COC	combined oral contraceptive
DMPA	depo medroxyprogesterone acetate (Depo-Provera®)
ECP	emergency contraceptive pills
FP	family planning
FSH	follicle stimulating hormone
GnRF	gonadotropin releasing factor
hCG	human chorionic gonadotropin
HIV	human immuno-deficiency virus
HPV	human papilloma virus
IUD	intrauterine contraceptive device
LH	luteinizing hormone
LAM	lactational amenorrhea method
LMP	last menstrual period
MCH	maternal child health
ML	mililiter
NET-EN	norethindrone enanthate (Noristerat®)
NFP	natural family planning
OC	oral contraceptive
POP	progestin-only pill
RH	reproductive health
STD	sexually transmitted disease
STM	symptothermal method
VSC	voluntary surgical contraception

INTRODUCTION

The menstrual cycle is a series of carefully coordinated events that prepares the woman's body for pregnancy. All contraceptive methods prevent pregnancy by either influencing parts of the menstrual cycle or by keeping the man's sperm from reaching the woman's ovum (egg).

It is important for family planning (FP)/reproductive health (RH) clinical service providers to understand the processes of the menstrual cycle in order to explain to clients how contraceptive methods work and to effectively respond to clients' problems and questions concerning contraceptive methods.

This Training Information Packet (TIP) describes the changes that occur in the average 28-day menstrual cycle and how the major contraceptive methods relate to the menstrual cycle. It also presents 21 client case studies in which FP/RH clinical service providers must apply their knowledge about the menstrual cycle in order to appropriately respond to client concerns and requests. This TIP is offered as a reference for FP trainers as they develop training activities and materials on these and other applications of reproductive anatomy and physiology.

This TIP is intended to promote client-centered quality care for FP services, in the context of integrated RH services. This TIP does not provide guidance on counseling and interpersonal communication skills, which are essential to responding to client concerns and requests.

INTENDED USERS

Primary users: FP/RH clinical trainers who conduct pre- and in-service training

Other users: FP/RH clinical trainees, service providers and supervisors

PURPOSE

To provide a reference that links the changes that occur in the menstrual cycle to actions of contraceptive methods, and enables service providers to better respond to FP client concerns and requests.

LEARNING OBJECTIVES

This trainers' reference will help the clinical trainer to:

1. Explain (with use of illustrations) the processes that occur during the 3 phases of the normal menstrual cycle.
2. Describe how contraceptive methods interrelate with the changes of the normal menstrual cycle.
3. Discuss selected FP cases concerning client problems or questions about contraceptive methods, using knowledge of the changes that occur in the menstrual cycle.

PART I:
THE MENSTRUAL CYCLE

LEARNING OBJECTIVES

After reading Part I of this trainers' reference, the trainer will be able to:

A. Define the menstrual cycle.

B. List and describe the functions of the primary organs involved in the menstrual cycle.

C. Explain the effects that specific hormones have on organs involved in the menstrual cycle, including examples of feedback.

D. Discuss the changes that occur in the anterior pituitary gland, ovaries, endometrium, cervix, and basal body temperature (BBT) during the 3 phases of the menstrual cycle.

E. Explain the effects of pregnancy on the menstrual cycle.

F. Explain the effects of abortion (spontaneous and induced) on the menstrual cycle.

A. DEFINITION OF THE MENSTRUAL CYCLE

The menstrual cycle is the preparation of a woman's body for a possible pregnancy. This series of events occurs monthly during the woman's reproductive years (from puberty to menopause).

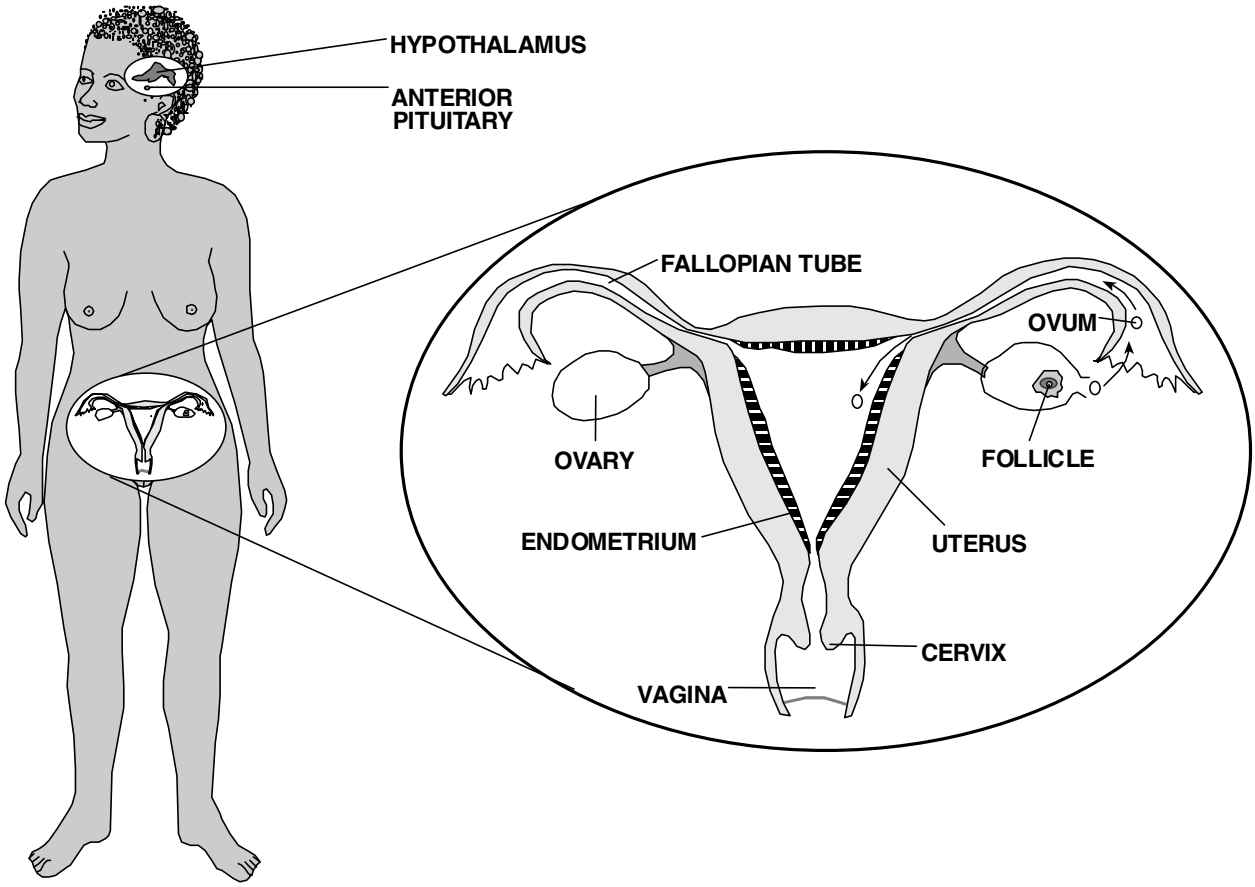
The menstrual cycle usually lasts about 25 to 32 days. However, women's menstrual cycles vary in their length and amount of bleeding, according to the woman's age, weight, diet, amount of physical activity, level of stress and genetics. The length of the menstrual cycle is counted from the first day of menstrual bleeding until the day before the first day of the next menstrual bleeding.

B. PRIMARY ORGANS INVOLVED IN THE MENSTRUAL CYCLE

The menstrual cycle includes the activities of the hormones of the hypothalamus, the anterior pituitary gland and the ovaries, and the resulting changes in the ovaries, uterus, cervix, and basal body temperature (BBT). This section defines these organs and other parts of the female reproductive system that are involved in the menstrual cycle. The information can be used by the trainer as a review guide to ensure common baseline knowledge by all the trainees.

Hypothalamus: the part of the brain that, among many other functions, releases gonadotropin "releasing factor" (GnRF) which regulates the release of luteinizing hormone (LH) and follicle stimulating hormone (FSH) from the anterior pituitary gland.

Figure 1: PRIMARY ORGANS INVOLVED IN THE MENSTRUAL CYCLE



Adapted from: Edmands EM, et al: *Glossary of Family Planning Terms/Glossaire de termes de planification familiale*. Chapel Hill, NC, INTRAH, 1987, p. 147.

Anterior pituitary gland: a pea-sized gland located at the base of the brain and connected to the hypothalamus. Among many other functions, it produces, stores, and releases FSH and LH.

Ovaries: the pair of glands in the female which produce ova (eggs) and the female sex hormones, estrogen and progesterone.

Ovum: (plural = ova) egg cell. The female reproductive germ cell that, when fertilized by a male sperm, can develop into a new individual of the same species.

Ovarian follicle: small sac in the ovary that encloses an ovum. At the beginning of each menstrual cycle, several ova begin to mature. One ovum fully matures and is then released by the dominant ovarian follicle. At birth, each woman has about 600,000 ovarian follicles in each ovary. During a woman's lifetime, only about 400 ova fully mature. The remainder dissolve and are reabsorbed by each ovary.

Corpus luteum: yellow body. After ovulation, the dominant ovarian follicle becomes the corpus luteum which produces small amounts of estrogen and large amounts of progesterone.

Fallopian tubes (also called uterine tubes): two long, thin tubes connected to the uterus, which provide passage for the ova from the ovaries. It is the place where the sperm meets the ovum and fertilization takes place.

Uterus: a hollow, muscular organ in the female pelvis in which the fertilized ovum grows and develops during pregnancy. In the absence of fertilization of the ovum, it sheds its lining during menstruation.

Endometrium: the mucus membrane which lines the inner wall of the uterus.

Cervix: the neck (or entrance) of the uterus.

Vagina: the genital canal in the female, extending from the cervix of the uterus to the vulva. It is the passageway through which babies are born and menstrual fluid flows.

C. EFFECTS OF HORMONES ON THE MENSTRUAL CYCLE

Hormones are chemical messengers that are carried in the bloodstream. They are substances which provide a means of communication between organs of the body. Hormones influence distant target cells by changing their chemical processes. Hormones can cause the target cells to change their rate of growth or their rate of producing specific chemical products.

The following is a discussion of the hormones involved in the menstrual cycle and their effects on the menstrual cycle.

1. A Releasing Factor of the Hypothalamus which Influences the Menstrual Cycle

GnRF (gonadotropin "releasing factor")
GnRF is a special kind of hormone called a "releasing factor" located in the hypothalamus. A "releasing factor" causes another gland or organ to release a different hormone(s) into the blood stream. For example, GnRF causes the anterior pituitary gland to produce, store and release FSH (follicle stimulating hormone) and LH (luteinizing hormone).

2. Hormones of the Anterior Pituitary Gland that Influence the Menstrual Cycle

FSH (follicle stimulating hormone)
FSH stimulates the growth of the ovarian follicles (which contain ova). As the ovarian follicles develop, FSH also stimulates the follicle cells to secrete large amounts of estrogen.

LH (luteinizing hormone)
A surge, or sudden release, of LH causes ovulation, the release of a mature ovum from the dominant ovarian follicle. After ovulation, LH stimulates the empty follicle to develop into the corpus luteum. LH then causes the corpus luteum to secrete increasing amounts of progesterone and small amounts of estrogen.

3. Hormones of the Ovaries that Influence the Menstrual Cycle

The ovaries contain the ovarian follicles which produce estrogen while maturing. After ovulation, the dominant ovarian follicle becomes the corpus luteum which produces progesterone and small amounts of estrogen.

Estrogen

Every month, the endometrium is built up under the influence of estrogen produced by the ovarian follicles. Estrogen stimulates glands in both the endometrium and the cervical canal. Changes in the cervical glands cause changes in the cervical mucus, making it clear, stretchy and slippery so that sperm can pass easily. The endometrial blood supply is increased in preparation for a possible fertilized ovum, and a thickened layer of endometrial tissue develops. Estrogen, along with FSH, also promotes the growth of the ovum in the ovarian follicle.

Estrogen causes "feedback" to the anterior pituitary gland for the regulation of FSH and LH. When the estrogen level increases to a certain level, it gives feedback to the anterior pituitary gland, causing a surge of stored LH that triggers ovulation. When the amount of estrogen in the blood becomes low, it causes feedback to the anterior pituitary gland to produce more FSH and LH in order to start a new menstrual cycle.

Estrogen also has other important functions in the body, such as:

- It initiates the growth and development of the uterus and other reproductive organs during puberty and pregnancy.
- Estrogen promotes the growth of mammary ducts and fat deposits in the breasts during puberty and pregnancy.
- It promotes bone growth and helps retain calcium in the bones throughout a woman's life.
- It gives protection from atherosclerosis and cardiovascular disease by causing blood vessels to dilate and by limiting the formation of atherosclerotic plaques from lipids.

Progesterone

After the dominant ovarian follicle releases a mature ovum, it changes into a corpus luteum and begins to secrete progesterone. Progesterone and estrogen further develop the endometrium by increasing the maturation of blood vessels in the endometrium. They cause the endometrial glands to enlarge and to begin secreting nutrients into the uterine cavity (in case the ovum is fertilized). Progesterone, however, also limits the volume of the endometrium; without progesterone, estrogen stimulation of the endometrium would be too great.

Progesterone affects hormone release from the hypothalamus and anterior pituitary gland. Through this "feedback" system, high levels of progesterone inhibit GnRF secretion and decrease FSH and LH secretions.

Progesterone also has other important functions in the body, such as:

- It sustains early pregnancy until the placenta develops (in approximately 10 weeks).
- The decline of progesterone helps initiate uterine contractions in labor.
- It provides a protective effect from breast cancer and endometrial cancer.

Table 1: Overview of Hormones Involved in the Menstrual Cycle

Hormone	Secreted By	Chief Functions
GnRF (gonadotropin releasing factor)	Hypothalamus	Regulates the secretion of FSH and LH.
FSH (follicle stimulating hormone)	Anterior pituitary	Stimulates the growth of ovarian follicles. Stimulates the ovarian follicle cells to secrete estrogen.
LH (luteinizing hormone)	Anterior pituitary	Causes ovulation. Converts ruptured dominant ovarian follicle into the corpus luteum. Stimulates the corpus luteum to secrete progesterone.
Estrogen	Ovary (follicle)	Promotes growth of blood vessels in the endometrium and increases the amount of endometrium to be shed. Promotes maturing of ovarian follicle. Promotes an increase in the amount of clear, stretchy and slippery "fertile" cervical mucus produced, to aid sperm. High levels cause a surge in LH, triggering ovulation. Very low levels cause the anterior pituitary gland to produce more FSH and LH.
Progesterone	Ovary (corpus luteum)	Promotes further development of blood vessels and glands in the endometrium. Limits the amount/volume of endometrium. Decreases the quantity of cervical mucus produced and causes the mucus to become so thick that sperm cannot travel through it. High levels inhibit secretion of GnRF and, therefore, FSH and LH.

Adapted from: Scanlon VC, Sanders T: *Essentials of Anatomy and Physiology*. Philadelphia, F.A. Davis Company, 1991, p 475, and Speroff L, et al.: *Clinical Gynecologic Endocrinology and Infertility,* 5th ed. Baltimore, Williams & Wilkins, 1994, pp 125, 534-537.

4. The Process of Feedback in the Menstrual Cycle

In the menstrual cycle, "feedback" is the regulation of the output of one hormone according to the amount(s) or effect(s) of other circulating hormones.

Negative feedback occurs when the output of one hormone is **decreased** because of the amount of other hormones circulating in the blood. For example,

- High blood levels of progesterone (and moderately high levels of estrogen) decrease the amount of GnRF secreted by the hypothalamus.
- When less GnRF is secreted, secretions of FSH and LH from the anterior pituitary gland are also decreased.

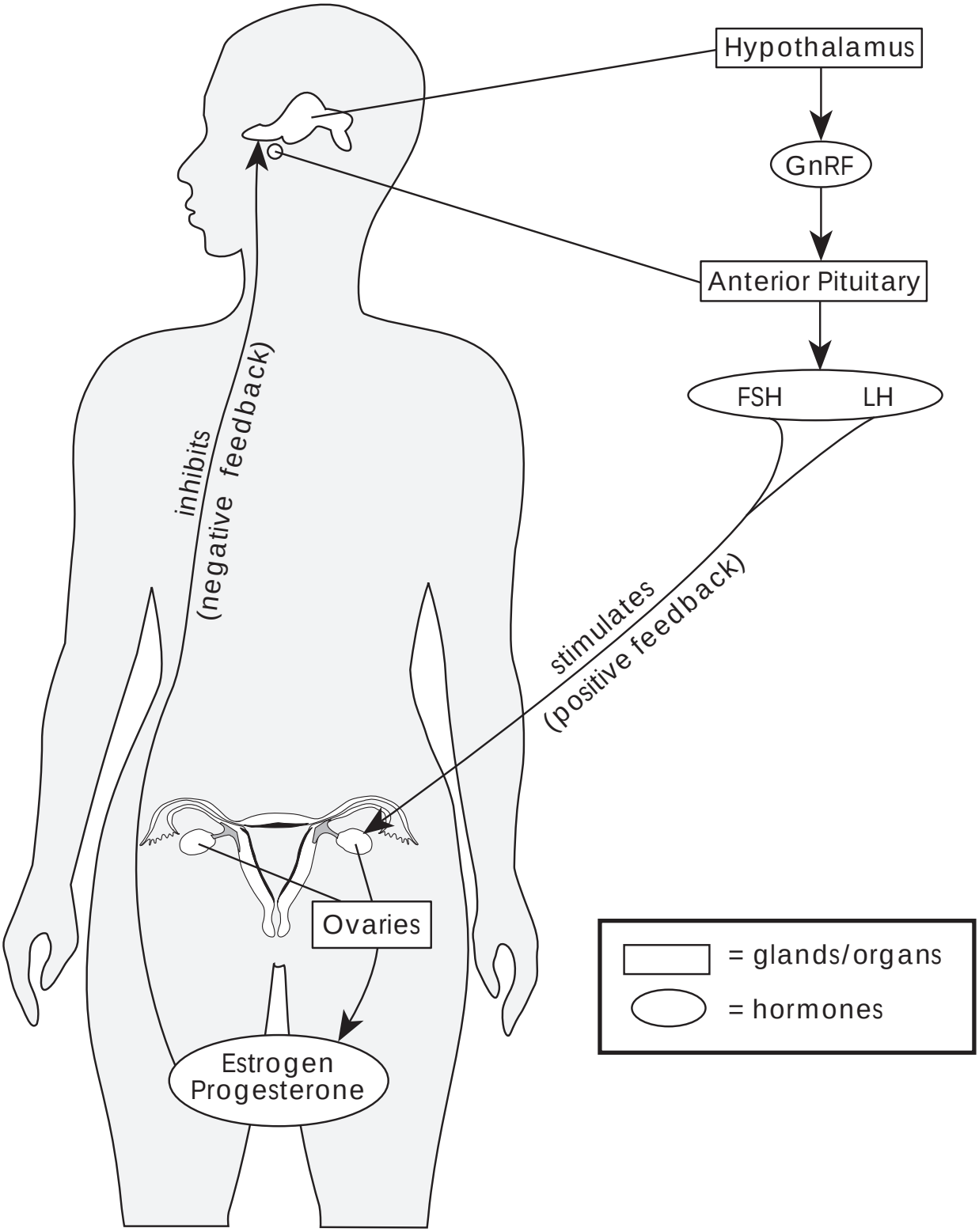
Positive feedback occurs when the output of a hormone is **increased** because of circulating hormone levels. For example,

- The anterior pituitary gland responds to low blood levels of estrogen by producing and storing more FSH and LH.
- The midcycle rise in blood levels of estrogen, signaling a mature ovum, causes the release of stored LH from the anterior pituitary gland. This LH surge results in ovulation.

The relationships of the hormones and organs involved in the menstrual cycle are complex. The production of estrogen and progesterone by the ovaries is regulated by the hormones of the anterior pituitary gland, FSH and LH, which are regulated by the hypothalamus.

During the menstrual cycle, the normal level for each hormone continuously changes. These hormone levels influence one another. The following diagram demonstrates an example of feedback.

Figure 2: Example of FEEDBACK IN THE MENSTRUAL CYCLE



D. THE THREE PHASES OF THE MENSTRUAL CYCLE

The phases of the menstrual cycle are usually described by the changes that occur in the ovary (the ovarian cycle) and/or by the changes that occur in the uterus (the endometrial cycle). This trainers' reference will examine the menstrual cycle according to changes in hormone levels and the consequent changes in the reproductive organs and among the hormones. The phases will be referred to as the: 1) Menstrual Bleeding Phase; 2) Estrogen Phase; and 3) Progesterone Phase.

The following chart shows how these phases relate to the ovarian and endometrial cycles.

Three Phases	Ovarian cycle	Endometrial cycle
Menstrual Bleeding Phase	Follicular	Menstrual Phase
Estrogen Phase	Phase	Proliferative Phase
Progesterone Phase	Luteal Phase	Secretory Phase

The following pages discuss the changes that occur during each phase in the anterior pituitary gland, ovaries, endometrium, cervix, and the resulting influence on the BBT. See Figure 3 on pages 15 and 16 while reading this portion of the text.

1. The Menstrual Bleeding Phase (Days 1 to 5)

The Menstrual Bleeding Phase is also known as menstruation, menses or period. Hormone levels are at their lowest point during this phase. The following changes occur during the Menstrual Bleeding Phase:

Hypothalamus and Anterior Pituitary Gland

The hypothalamus begins to produce GnRF because of the low levels of estrogen and progesterone in the blood. GnRF stimulates the anterior pituitary gland to begin producing, storing and releasing FSH and LH.

Ovaries

Approximately 20 ovarian follicles enlarge during the first week of each menstrual cycle. They produce estrogen and begin to ripen an ovum in response to FSH from the anterior pituitary gland.

Endometrium

The endometrium is the mucus membrane lining the uterus. During the Menstrual Bleeding Phase, the top (superficial) layer of the thick endometrial lining is becoming detached from the uterine wall, resulting in discharge of endometrial tissue, fluid and blood. The bleeding lasts for 3 to 5 days. The average blood loss is about 50 mililiter (ML).

Cervix

The cervical canal is open slightly to permit menstrual flow to escape. The cervical glands produce very little mucus during these low-estrogen days of the cycle.

Basal Body Temperature (BBT)
The BBT is the temperature of the body at rest. During the menstrual cycle, the BBT rises from a lower level to a higher level. During the Menstrual Bleeding Phase, the BBT is at its lower level due to the decrease in the production of progesterone in the body.

2. The Estrogen Phase (Days 6 to 14)

The Estrogen Phase begins about Day 6 and lasts until about Day 13 to 14 when ovulation occurs. It is more variable in length than the other phases. The following changes occur during the Estrogen Phase:

Anterior Pituitary Gland
The anterior pituitary gland continues to increase its production and storage of LH and FSH. Small amounts of LH and FSH are released into the bloodstream.

Around Day 13 (just prior to ovulation), the high level of estrogen in the blood produced by the dominant ovarian follicle triggers a surge of stored LH (from the anterior pituitary gland) into the bloodstream.

Ovaries
By Day 5 to 7, one ovarian follicle is developing more rapidly than the others. This is the dominant follicle which will go on to ovulation. The other follicles stop growing; most will shrink and disappear into the ovarian tissue.

As the dominant follicle cell develops, it releases an increasing amount of estrogen. The dominant follicle breaks open and releases its ovum because of a surge of LH (from the anterior pituitary gland) into the bloodstream. This process is called ovulation. Ovulation occurs about 12 to 16 days BEFORE the beginning of the next menses. Even in shorter menstrual cycles, ovulation rarely occurs before Day 10 of the cycle; ovulation, which may result in pregnancy ("fertile" ovulation), rarely occurs before Day 12.

Endometrium
The endometrium is built up under the influence of estrogen produced by the growing ovarian follicles. The endometrium develops glands, capillaries and general tissue swelling. With this increased blood supply, the endometrium is prepared for a possible implantation of a fertilized ovum.

Cervix
The cervical canal is closed, except during the time of ovulation. It is then open to permit the entrance of sperm.

Initially in the Estrogen Phase, no mucus loss from the cervix is apparent. A sensation of dryness exists (although the interior of the vagina is always moist). As the blood levels of estrogen increase, the quantity of cervical mucus also steadily increases because glands in the cervical canal are stimulated by the estrogen. The maximum amount of mucus is produced about the time of ovulation. The mucus becomes clear, slippery and stretchy (like uncooked egg white) and can flow out of the vagina. This type of mucus nourishes the sperm and helps it to travel into the uterus.

Basal Body Temperature (BBT)
The BBT remains at its lower level under the influence of estrogen. Just before ovulation, at the start of the LH surge, the BBT may fall a bit more.

3. The Progesterone Phase (Days 15 to 28)

The Progesterone Phase begins at approximately Day 15 and ends at about Day 28. The length of this phase is predictably 2 weeks long. It does not vary much from month to month or from woman to woman. The following changes occur during the Progesterone Phase:

Anterior Pituitary Gland
The empty dominant follicle in the ovary changes into a corpus luteum (which produces progesterone and some estrogen) because of stimulation resulting from the high level of LH released by the anterior pituitary gland.

If the ovum is not fertilized, the activity of the pituitary is inhibited because of the high level of progesterone in the blood produced by the corpus luteum. The pituitary production of LH is then reduced (an example of negative feedback).

Ovaries
The corpus luteum is a reorganization of the cells from the ruptured egg follicle. The corpus luteum steadily produces and secretes progesterone. The progesterone reaches a maximum amount about 8 days after ovulation. The corpus luteum also produces small amounts of estrogen during this phase.

As progesterone secretion increases, LH secretion decreases (negative feedback). The corpus luteum begins to degenerate by Day 23 to 24 because the LH level is low. Thus, the production of estrogen and progesterone also declines.

Endometrium
From Days 15 to 22, the blood supply to the endometrium continues to increase due to the rising levels of progesterone produced by the corpus luteum of the ovary.

The endometrial glands become larger and secrete nutrients into the uterine cavity because of progesterone stimulation. These nutrients can nourish a fertilized ovum until it is implanted.

Progesterone and estrogen in the blood decrease toward the end of this phase because of the degenerating corpus luteum (Days 23 to 28). The blood vessels supplying the endometrium constrict as a result of this lack of stimulation from the ovarian hormones. The endometrial cells cannot receive the oxygen and nutrients that the blood vessels carried, and they begin to die. The Menstrual Phase begins, and menstrual bleeding occurs.

Cervix
During the progesterone phase, the cervical canal remains closed.

The quantity of cervical mucus decreases. A woman may become “dry” again or develop sticky, thick, cloudy discharge. This mucus makes it difficult for sperm to penetrate and travel into the uterus.

Basal Body Temperature (BBT)
Shortly before, during or after ovulation, the BBT rises 0.2 to 0.5 degrees centigrade, due to the increase in progesterone production. The BBT remains elevated until progesterone levels drop and the Menstrual Phase begins. (See Figure 3 on pages 15 and 16 for an example.)

E. EFFECTS OF PREGNANCY ON THE MENSTRUAL CYCLE

If fertilization of the ovum occurs, the hormone patterns of the last half of the menstrual cycle change. Another hormone, human chorionic gonadotropin (hCG), will be produced by the developing placenta. hCG is the hormone detected by a pregnancy test. Its blood levels peak at 8 to 12 weeks after conception.

Anterior Pituitary Gland
The levels of FSH and LH fall greatly, because their production is suppressed (through negative feedback) by the high blood levels of estrogen and progesterone. (Hormonal contraceptives imitate the state of pregnancy. They release high enough levels of estrogen and/or progestin into the blood to convince the anterior pituitary that the woman is already pregnant. Consequently, the anterior pituitary stops producing FSH and LH.)

Ovaries
In early pregnancy, hCG prevents the corpus luteum from degenerating, so it will continue to function and release progesterone and estrogen to support the developing embryo. By 7 to 10 weeks after conception, the placenta is able to provide the high levels of estrogen and progesterone needed in pregnancy.

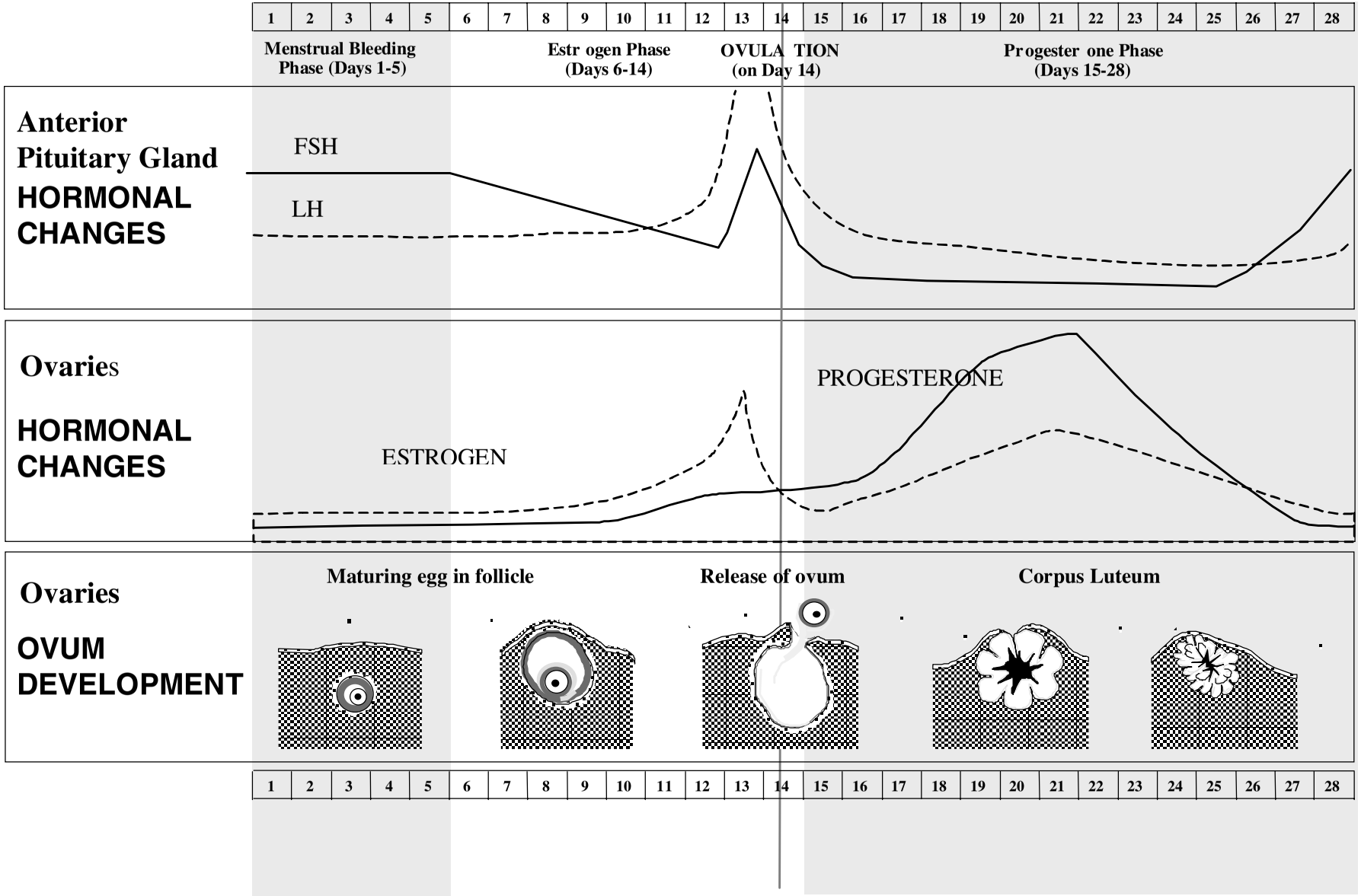
Endometrium
When the embryo implants, the continued secretion of progesterone causes the endometrial cells to swell even larger and store and provide more nutrients for the growth of the fetus.

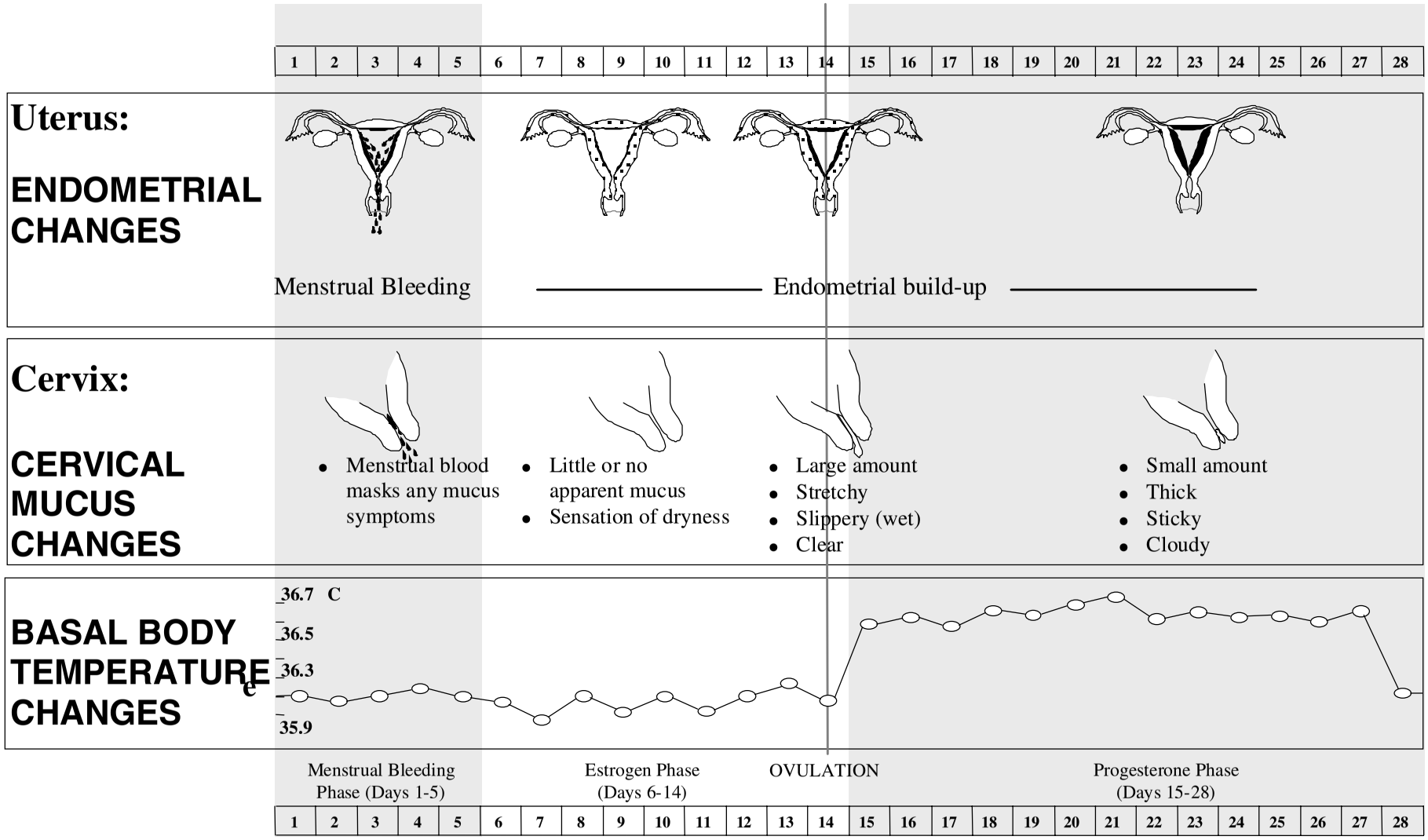
Cervix
The external cervical canal enlarges slightly, bleeds more easily and becomes filled with a thick mucus “plug”, which helps protect the amniotic sac from vaginal microbes.

Basal Body Temperature (BBT)
The BBT remains elevated, as in the progesterone phase of the menstrual cycle.

Figure 3:

CHANGES IN THE MENSTRUAL CYCLE





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Changes in the Menstrual Cycle adapted from: 1)Speroff L, Glass R, Kase NG: *Clinical Gynecologic Endocrinology and Infertility,* 5th ed. Baltimore, Williams & Wilkins, 1994; p 191. 2)Bethea DC: Introductory Maternity Nursing, 5th ed. Philadelphia, Lippincott Co., 1989, Fig. 5-4, p 65. 3)Fetter K, et al: *Teaching and Learning with Visual Aids.* London, Macmillan Publishers, Ltd., 1987, pp 277-79; 4)*Family Planning Methods and Practices: Africa*. Atlanta, GA, Centers for Disease Control, 1989, Figure 7.2, p 94, and 5)Kass-Annese B, Aumack K, Goodman L: *Guide for Natural Family Planning Trainers*. Washington, DC, Institute for International Studies in Natural Family Planning, Georgetown University, 1990, p 186.

F. EFFECTS OF ABORTION (spontaneous or induced) ON THE MENSTRUAL CYCLE

A spontaneous abortion is an unprovoked interruption of a pregnancy before there is a viable fetus. The cause is usually uncertain, but is sometimes linked to conditions such as malnutrition and/or malaria. Induced abortion refers to the use of a procedure to terminate an unwanted pregnancy.

Ovaries
With the loss of the pregnancy, progesterone and estrogen levels fall rapidly, and FSH levels begin to rise within two weeks of a first trimester abortion and within four weeks of a second trimester abortion. Fertility returns almost immediately postabortion (spontaneous or induced): within two weeks for first trimester abortion and within four weeks for second trimester abortion. Within six weeks of abortion, 75% of women have ovulated.

Endometrium
If the abortion was induced under unsafe conditions, bacteria may have entered the uterus, and endometritis (uterine infection) may be present (requiring prompt treatment).

If the abortion was performed or occurred under hygienic conditions, the endometrium will rapidly repair, and future fertility will be unaffected. Sharp instruments (curettage) can damage and even severely scar the endometrium.

Cervix
The cervical mucus will resume its usual fertile mucus cycle with ovulation. The cervix may be damaged by instruments used during induced abortion. (Soft plastic canulas rarely cause cervical damage.)

Basal Body Temperature (BBT)
The BBT falls to pre-ovulatory levels shortly after the abortion.

STUDY QUESTIONS

Instructions: The following questions can be used for trainers' self-study or for review sessions with trainees.

- Answer all of the questions on a separate sheet of paper.
- Study the answers to the questions you did not know. The answers can be found on the page following the last question.
- For trainee reviews, use the questions as objective test items or in a "grab bag" session with questions written on index cards.

1. In very general terms, describe what is happening in a woman's body during her monthly "menstrual cycle".
2. How do you calculate the length of a menstrual cycle?
3. Which organ regulates the release of LH and FSH?
4. Where is LH and FSH produced and stored until it is released?
5. Which organs produce ova and the female sex hormones, estrogen and progesterone?
6. In general, what are hormones and what do they do?
7. a. What is a "releasing factor"?
   b. Which hormone serves as a "releasing factor" in the menstrual cycle?
   c. Where is the "releasing factor" hormone located?
   d. With what organ does the "releasing factor" communicate?
   e. What happens after the communication?
8. List the primary functions of:
   a. FSH in the menstrual cycle.
   b. LH in the menstrual cycle.
9. Which hormone stimulates the building up of the endometrium, promotes the growth of the ovum and causes a surge of LH?
10. Which hormone limits the volume of the endometrium and inhibits the release of FSH and LH?
11. List two functions for both estrogen and progesterone other than their effects on the menstrual cycle.
12. a. What is "feedback" in the menstrual cycle?
    b. How does negative feedback operate? Give an example.
    c. How does positive feedback operate? Give an example.

STUDY QUESTIONS (continued)

13. During the "menstrual bleeding phase,"
    a. Describe the levels of estrogen and progesterone.
    b. Explain what is happening in the ovaries.
    c. What hormone affects the BBT during this phase? What happens to the BBT?
    d. Describe what is happening with the endometrium and cervical canal during this phase.
14. During the "estrogen phase,"
    a. What marks the beginning and end of the phase?
    b. Describe the development of egg follicles.
    c. When does ovulation generally occur?
    d. What triggers ovulation? Why?
    e. Describe how estrogen affects the endometrium and cervical canal. For what purpose?
    f. How does estrogen influence cervical mucus?
    g. What happens to the BBT?
15. During the "progesterone phase,"
    a. What marks the beginning and end of this phase?
    b. What effect does the high level of LH from the anterior pituitary gland have?
    c. What is the corpus luteum and what hormones does it chiefly secrete?
    d. What happens to LH levels and the corpus luteum as the progesterone levels increase?
    e. How does the rise of progesterone affect the endometrium and the cervical mucus?
    f. Describe the cervical canal and the BBT after ovulation. Why?
16. During pregnancy,
    a. What happens to hormone levels?
    b. How does the corpus luteum function during early pregnancy?
17. After an abortion (spontaneous or induced),
    a. What happens to hormone levels?
    b. How soon does fertility return?

ANSWERS TO STUDY QUESTIONS

1. A woman's body is preparing for pregnancy.
2. The length of the menstrual cycle is counted from the first day of menstrual bleeding until the day before the first day of the next menstrual bleeding.
3. The hypothalamus (located in the brain) regulates the release of FSH and LH.
4. FSH and LH are produced and stored in the anterior pituitary gland (also located in the brain) until they are released.
5. The ovaries produce ova, estrogen and progesterone.
6. Hormones are chemical messengers that are carried in the bloodstream. They are substances which enable various organs of the body to communicate.
7. a. A "releasing factor" is a hormone located in one gland or organ which causes another gland or organ to release a different hormone(s) into the bloodstream.

   b. GnRF (gonadotropin releasing factor)

   c. in the hypothalamus

   d. GnRF communicates with the anterior pituitary gland.

   e. The anterior pituitary gland produces, stores and releases FSH and LH.
8. a. FSH stimulates the:
   - growth of the ovarian follicles
   - follicle cells to secrete large amounts of estrogen

   b. LH:
   - a surge of LH causes ovulation
   - after ovulation, LH stimulates the empty follicle to develop into the corpus luteum
   - then causes the corpus luteum to secrete increasing amounts of progesterone
9. estrogen
10. progesterone
11. Any of the following are correct.

    Estrogen:
    - initiates the growth and development of the uterus and other reproductive organs during puberty and pregnancy.
    - promotes the growth of mammary ducts and fat deposits in the breasts during puberty and pregnancy.
    - promotes bone growth and helps retain calcium in the bones throughout a woman's life.
    - gives protection from atherosclerosis and cardiovascular disease.
    -

ANSWERS TO STUDY QUESTIONS (continued)

Progesterone:

- sustains early pregnancy until the placenta develops (in approximately ten weeks).
- helps initiate uterine contractions in labor.
- provides a protective effect from breast cancer and endometrial cancer.

12. a. Feedback in the menstrual cycle is the regulation of the output of a hormone by the effect of other circulating hormones.

    b. Negative feedback occurs when the output of a hormone is **decreased** by circulating hormone levels.

    Example: High blood levels of progesterone (and moderately high levels of estrogen) inhibit GnRF secretion from the hypothalamus. Thus, secretions of FSH and LH from the anterior pituitary gland are decreased.

    c. Positive feedback occurs when the output of a hormone is **increased** by circulating hormone levels.

    Example: (1) The anterior pituitary gland responds to low blood levels of estrogen by producing and storing FSH and LH. Small amounts of FSH and LH are released into the blood. (2) The midcycle rise in blood levels of estrogen causes the surge of stored LH from the anterior pituitary gland. This surge into the bloodstream results in ovulation.

13. a. Hormone levels are at their lowest during this phase.

    b. Approximately 20 ovarian follicles enlarge during the first week of each menstrual cycle. They produce estrogen and begin to ripen an ovum.

    c. The BBT is at its lower level during this phase due to the decrease in the production of progesterone in the body.

    d. The endometrial lining is becoming detached from the uterine wall, resulting in discharge of tissue, fluid and blood. The cervical canal is slightly open to allow the menstrual discharge to escape.

14. a. The estrogen phase begins approximately Day 6, once menstruation has stopped, and lasts approximately until Day 13 or 14, or when ovulation occurs.

    b. After the menstrual bleeding phase, one follicle begins developing more rapidly than the rest; the others stop growing. These follicles will shrink and disappear into the bloodstream. The dominant follicle will go on to break open and release an ovum at ovulation.

    c. Ovulation occurs about 12 to 16 days BEFORE the beginning of the next menses.

    d. Ovulation is triggered by a surge of LH into the bloodstream, caused by the high blood level of estrogen produced by the dominant follicle.

    e. Estrogen causes the endometrium to build up in preparation for possible implantation by a fertilized ovum. At the time of ovulation, the cervical canal is open to permit sperm to enter.

ANSWERS TO STUDY QUESTIONS (continued)

f. At the beginning of the phase, there is not much mucus. As estrogen increases, the cervical mucus increases and becomes clear, slippery and stretchy (in order to help sperm travel to the uterus). The maximum amount of mucus is produced at ovulation.

g. Under influence of estrogen, the BBT remains at its lower level and may fall a bit more just before ovulation.

15. a. The progesterone phase begins the day after ovulation, usually around Day 15, and ends at about Day 28, or when menses begins.

b. The high level of LH causes the empty dominant follicle to change into a corpus luteum.

c. The corpus luteum is a reorganization of the cells from the ruptured egg follicle. The corpus luteum steadily produces and secretes primarily progesterone and small amounts of estrogen.

d. As progesterone secretion increases, LH secretion decreases, which causes the corpus luteum to degenerate by Day 23 or 24.

e. Initially, because of progesterone stimulation, the endometrium glands becomes larger. Then as levels of progesterone and estrogen decrease, the endometrial cells begin to die and menstrual bleeding occurs. During this phase, the cervical mucus decreases.

f. The cervical canal remains closed. Around ovulation, due to the increase in progesterone, the BBT rises and remains elevated until menses begins.

16. a. Human chorionic gonadotropin (hCG), a hormone, will be produced by the developing placenta. (hCG is the hormone detected by a pregnancy test.)

b. The corpus luteum will continue to function and will continue to release progesterone and estrogen until the placenta is able to provide these hormones.

17. a. Progesterone and estrogen levels fall rapidly. hCG levels may fall more slowly.

b. Fertility returns almost immediately postabortion: within two weeks for first trimester abortion and within four weeks for second trimester abortion. Within six weeks of abortion, 75% of women have ovulated.

PART II:

HOW CONTRACEPTIVE METHODS INTERRELATE WITH THE MENSTRUAL CYCLE

LEARNING OBJECTIVES

After reading Part II, the trainer will be able to describe how the following eight types of contraceptive methods interrelate with the changes of the menstrual cycle:

A. Fertility Awareness Methods
B. Lactational Amenorrhea Method (LAM)
C. Progestin-Only Contraceptives
D. Combined Oral Contraceptives (COC)
E. Intrauterine Contraceptive Devices (IUD)
F. Voluntary Surgical Contraception (VSC)
G. Barrier Contraceptive Methods and Spermicides
H. Emergency Contraceptive Pills (ECP)

A. FERTILITY AWARENESS METHODS

Fertility awareness methods are based on predicting the fertile and non-fertile phases of the menstrual cycle in order to achieve or avoid pregnancy. To avoid pregnancy, a couple will abstain from sexual intercourse or use a barrier method during the fertile days. To conceive, the couple will do the opposite. Four fertility awareness methods are described below.

1. Cervical Mucus Method (CMM)

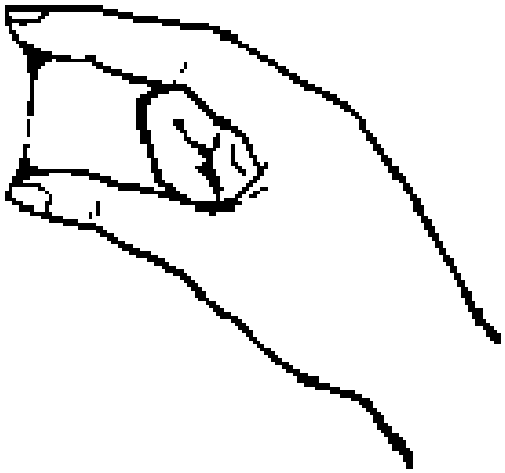
A woman using the cervical mucus method predicts the fertile period through daily self-observation of the changes in quantity and consistency in the cervical mucus during the course of the menstrual cycle.

How does the Cervical Mucus Method work?

Early in the cycle, after menstrual bleeding ends, most women have one or more days in which no mucus is observed and the vagina feels dry. Then scant, cloudy, thick, sticky mucus appears. As ovulation approaches and the concentration of estrogen in the bloodstream increases to reach its maximum, the cervical mucus increases in amount and changes to a clear, slippery and stretchy substance. This mucus nourishes sperm and helps it to travel into the uterus. It lasts two to four days for most women. After ovulation, progesterone inhibits the production of cervical mucus. The mucus usually decreases in amount and becomes cloudy, thick and sticky again -- and thus less penetrable by sperm.

In order to avoid pregnancy, a couple using the cervical mucus method must abstain from sexual intercourse or use barrier methods on all days which the woman notices the presence of mucus and until the fourth day after the "peak symptom day." (The "peak symptom day" is the last day of wet, stretchy, slippery, fertile mucus.)

Figure 4: Wet, Stretchy Mucus



Source: Kass-Annese B, Aumack K, Goodman L: *Guide for Natural Family Planning Trainers.* Washington, DC, Institute for International Studies in Natural Family Planning, Georgetown University, 1990, p 112.

2. Calendar Method

A woman using the calendar method predicts the fertile period by calculations based on the length of at least 6 previous menstrual cycles. These calculations take into account how long sperm and ova usually live and when ovulation is likely **not** to occur.

How is the Calendar Method calculated?

The woman counts the days of the **shortest** cycle (from the first day of menstrual bleeding until the day before the first day of the next menstrual bleeding) she has had in the last 6 months and subtracts **20**. This calculation determines the first day that she is likely to be fertile in an average month.

Then she counts the days of the **longest** cycle she has had in the last 6 months and subtracts **11**. This will calculate the last day that she is likely to be fertile in an average month.

Example:
The **shortest** cycle for a client in the past 6 months is 25 days.
25 minus **20** = Day 5 = the **first** likely day the client is fertile in an average month.

The **longest** cycle in the past 6 months for this client is 33 days.
33 minus **11** = Day 22 = the **last** likely day the client is fertile in an average month.

Therefore, to avoid pregnancy using the calendar method, the woman should abstain from sexual intercourse or use a barrier method from Days 5 to 22 of every menstrual cycle.

Why is the Calendar Method calculated this way?

"The Minus 20 Rule"

After intercourse, most sperm live about 3 days, but there is about a 10% chance that a 4-day-old sperm can successfully fertilize an ovum. The chance of pregnancy exists when live sperm are present at the time of ovulation or during the 24 hours after ovulation (the ovum is alive and can still be fertilized during this time period).

Ovulation occurs at the end of the Estrogen Phase. The Progesterone Phase is typically **12** to **16** days long. Thus, in a 28 day cycle, a woman could ovulate as early as Day 28 **minus 16** = Day 12 = the earliest likely day of ovulation.

Since some sperm can survive and fertilize for **4** days, Day 12 (ovulation) **minus 4** = Day 8 = earliest day on which intercourse could likely result in pregnancy.

Since subtracting 16 days and 4 days from the last day of the cycle is the same as subtracting 20 days from the last day of the shortest cycle, this is the "Minus 20 Rule".

"The Minus 11 Rule"

The last day of the cycle that a woman is fertile is **the day after ovulation**. Since ovulation can occur as late as 12 days before the next menses, subtract **11** from the length of the longest cycle to find the last possible day that intercourse could result in pregnancy.

3. Basal Body Temperature Method (BBT)

A woman using the BBT method predicts the fertile period by charting her resting temperature every day and noting the rise in temperature caused by ovulation.

How does the BBT Method work?

The woman must take her temperature each morning for 3 to 5 minutes before getting out of bed or eating. She must take her temperature from the same site (rectally or orally) throughout the cycle. A special type of thermometer is needed. She then plots her temperature on a special chart so she can note when the increase in temperature occurs. After ovulation, increased progesterone levels will cause the BBT to rise about 0.2 to 0.5 degree centigrade (0.5 to 1.0 degree Fahrenheit). When the BBT has remained elevated for 3 days, the woman is assured ovulation has passed, and she is no longer fertile during the current cycle.

When a couple uses this method, they should abstain from sexual intercourse or use a barrier method from day 1 of the menstrual cycle until 3 days after the temperature increases. (See chart of the BBT method in Figure 3 on page 15.)

4. Symptothermal Method (STM)

The STM combines the cervical mucus method (CMM) and the basal body temperature method (BBT) to predict the fertile period.

Sometimes other signs and symptoms of ovulation can also be observed by the woman, such as midcycle abdominal pain due to ovulation, midcycle spotting, breast tenderness, and cervical changes. Sometimes the calendar method is also combined with the CMM and BBT.

5. Effectiveness

Fertility awareness methods are, on the average, about 80% effective for a "typical couple." The STM is thought to be slightly more effective than the CMM and is more effective than the calendar method, if practiced with pre-ovulatory abstinence. Pre-ovulatory abstinence is when a couple abstains from intercourse (or uses a barrier method) during the first half of the menstrual cycle, until after ovulation has occurred. When a couple chooses to have intercourse without a back-up method of contraception during the early part of the cycle (i.e., during or just after the menstrual period), there is a greater risk of accidental pregnancy, unless the woman is sure she has not yet started secreting mucus.

B. LACTATIONAL AMENORRHEA METHOD (LAM)

The Lactational Amenorrhea Method (LAM) is a family planning method for breastfeeding women who must fulfill the following three criteria:

1. The woman must be in the first 6 months postpartum.
2. The woman must be fully or nearly fully breastfeeding.
3. The woman must be amenorrheic (not having menstrual bleeding). Bleeding occurring in the first 56 days postpartum is not considered menstrual bleeding.

If the woman is "fully or nearly fully breastfeeding" and amenorrheic, breastfeeding is 98% effective as a contraceptive method during the first 6 months postpartum or until the first menstrual period. Bleeding occurring during the first 56 days (8 weeks) after delivery in a breastfeeding woman is not considered menstruation because it is not preceded by ovulation.

"Fully or nearly fully breastfeeding" means breastfeeding on demand on both breasts with no 2 feedings more than 4 hours apart during the day or 6 hours apart during the night. Food or liquid must not be given regularly to the baby as substitutes for breast milk meals.

Before any one of these three LAM criteria no longer applies, the woman should be assisted in choosing another available and acceptable family planning method. If a woman chooses to use oral contraceptives, pill packets may be given to the woman in advance (while she is still relying on LAM), so there will be no delay in initiating the new method when the woman needs it.)

How does Lactational Amenorrhea (LAM) work?

Frequent suckling decreases the secretion of GnRF (gonadotropin releasing factor) by the hypothalamus. This, in turn, suppresses the anterior pituitary gland's secretion of LH. The LH surge required for ovulation does not occur.

C. PROGESTIN-ONLY CONTRACEPTIVES

1. Progestin-Only Injectable Contraceptives (DMPA, NET-EN)

Progestin-only injectable contraceptives contain synthetic progestins, which are similar to the human progesterones in a woman's body. DMPA (depot medroxyprogesterone acetate, Depo-Provera®) and NET-EN (norethindrone enanthate, Noristerat®) are the two most common injectable contraceptives. In 1996, WHO approved two more injectable contraceptives which contain both estrogen and progesterone (called Cyclofem and Mesigyna); which are discussed under section E. Once-a-month Combined Injectables.

How do progestin-only injectable contraceptives work?

They prevent pregnancy chiefly by:

1. consistently suppressing ovulation. They cause "negative feedback" to the pituitary gland by providing high levels of progestins which, in turn, block the release of both FSH and LH.
2. causing cervical mucus to remain too thick for sperm to reach the uterus.

In addition, progestin-only injectables cause the lining of the uterus to become less rich in blood vessels and unprepared for a fertilized ovum to implant. Because the injectables prevent the lining of the uterus from building up, amenorrhea (absent menses) often occurs after using injectables for about a year.

When can progestin-only injectable contraceptives be started?

Progestin-only injectables may be started during the first 7 days of the menstrual cycle (Days 1 through 7) or anytime the service provider can be reasonably sure the client is not pregnant (e.g., if she is switching from an IUD to injectables).

If a postpartum woman is breastfeeding and does not wish to rely on LAM, the World Health Organization (WHO) recommends that she wait at least 6 weeks after delivery before initiating injectable contraceptives because the safety of progestins for breastfeeding babies in the first six weeks is not known. If she has resumed sexual relations before six weeks postpartum, she should use condoms until she receives her injection. If a postpartum woman is **not** breastfeeding, she may start progestin-only injectables immediately postpartum or anytime the service provider can be reasonably sure that she is not pregnant. Progestin-only injectables are also safe and appropriate for use immediately postabortion (spontaneous or induced) during any trimester. They may be initiated within the first 7 days postabortion.

When do progestin-only injectable contraceptives take effect?

Experts believe that injectables effectively thicken cervical mucus within 24 hours of initiation. Therefore, if injectables are begun after Day 7 of the cycle, it is recommended that a woman abstain or use a back-up method for up to 7 days.

What are the most common side effects of progestin-only injectable contraceptives?

The most common side effects for all progestin-only contraceptives (e.g., injectables, NORPLANT® Implants and progestin-only pills) include menstrual cycle disturbances, including irregular spotting or bleeding and amenhorrhea, because of their effect on the endometrium and on ovulation. Prolonged and/or frequent or absent bleeding is especially common with DMPA use.

How long do progestin-only injectable contraceptives work?

NET-EN needs to be given every 2 months; DMPA needs to be given every 3 months. One can safely receive reinjection of NET-EN one week late. DMPA has a grace period of 2 weeks.

How do progestin-only injectables affect future fertility?

After discontinuing DMPA, about 50% of women conceive by 7 months (i.e., 10 months after the last injection). This time delay to conception is about 4 months longer than the time it takes for women who discontinue COCs, IUDs, or barrier methods to conceive. This is because small amounts of DMPA remain in circulation for about 7 to 9 months after the last injection. The delay in return to fertility with NET-EN is presumed to be no more than with DMPA.

2. Progestin-Only Pills (POPs)

POPs are pills that contain low doses of synthetic progestin.

How do POPs work?

They work chiefly by:

1. causing cervical mucus to become too thick for sperm to reach the uterus. (This is probably the most important mechanism.)
2. suppressing ovulation. (This does not occur in all cases.)

In addition, POPs alter fallopian tube motility (slowing the movement of the ovum toward the uterus) and cause the lining of the uterus to become less rich in blood vessels and unprepared for a fertilized egg to implant.

Some women may continue to ovulate while taking POPs (because progestin levels may not be high enough to consistently provide "negative feedback" to the pituitary, inhibiting the production of FSH and LH). For protection against pregnancy, these ovulating women depend on POPs making their cervical mucus too thick for sperm to travel to the uterus. Because the effect of each POP on cervical mucus is very short lived (a little under 24 hours), it is very important that women take POPs every day at the same time.

When can POPs be started?

POPs may be started anytime the service provider can be reasonably sure the client is not pregnant (for example, Days 1 through 7 of the menstrual cycle). However, some family

planning experts recommend that if POPs are begun after Day 2 of the cycle, a back-up method or abstinence should be used for 7 days.

If a postpartum woman is breastfeeding and does not wish to rely on LAM, WHO recommends that she wait at least 6 weeks after delivery before initiating POPs. The safety of progestins for breastfeeding babies in the first six weeks is not known. If she has resumed sexual relations, she should use condoms until she receives her POPs. If a postpartum woman is **not** breastfeeding, she may start POPs immediately postpartum, or any other time the service provider can be reasonably sure that she is not pregnant. POPs are safe and appropriate for use immediately postabortion (spontaneous or induced) in any trimester. Because fertility returns almost immediately after abortion, POPs should be initiated during the first 7 days postabortion.

When do POPs take effect?

Experts believe that POPs effectively thicken cervical mucus 24 hours after initiation. Experts believe the contraceptive effect of POPs on cervical mucus is complete by 48 hours after initiation (by the time the third pill is taken).

What are the most common side effects of POPs?

The most common side effects for all progestin-only contraceptives (e.g., injectables, NORPLANT® Implants and progestin-only pills) include menstrual cycle disturbances, including irregular spotting or bleeding and amenhorrhea, because of their effect on the endometrium and on ovulation.

How long do POPs work?

POPs are mostly cleared from the body within one day. For this reason, when a woman misses 2 or more POPs, she should resume taking her pills and use a back-up method for 48 hours.

How do POPs affect fertility?

The dose of progestin in POPs is very low compared to the dose of progestin in combined oral contraceptives (COCs). When the pills are stopped, there is almost no delay in return to baseline fertility.

3. NORPLANT® Implants

NORPLANT® Implants are small plastic capsules filled with synthetic progestins. They are inserted under the skin on the inside of a woman's upper arm. The progestin is slowly and continuously released into the woman's body.

How do NORPLANT® Implants work?

NORPLANT® Implants work chiefly by:

1. making the woman's cervical mucus too thick for sperm to pass through.
2. suppressing ovulation.

In addition, NORPLANT® Implants cause the lining of the uterus to become less rich in blood vessels and unprepared for an ovum to implant.

Some women may occasionally ovulate while on NORPLANT® Implants because progestin levels may not be high enough to consistently provide "negative feedback" to the anterior pituitary gland to block the production of FSH and LH.

When can NORPLANT® Implants be inserted?

NORPLANT® Implants can be inserted anytime the service provider can be reasonably sure the woman is not pregnant (for example, Days 1 through 7 of the menstrual cycle).

If a postpartum woman is breastfeeding and does not wish to rely on LAM, WHO recommends that she wait at least 6 weeks after delivery before initiating NORPLANT® because the safety of progestins for breastfeeding babies in the first six weeks is not known. If she has resumed sexual relations before 6 weeks postpartum, she should use condoms until she receives her NORPLANT® Implants. If a postpartum woman is **not** breastfeeding, she may start NORPLANT® Implants immediately postpartum, or any other time the service provider can be reasonably sure that she is not pregnant.

NORPLANT® Implants are safe and appropriate for use immediately postabortion (spontaneous or induced), in any trimester, and should be inserted within the first 7 days postabortion.

When do NORPLANT® Implants take effect?

Experts believe that NORPLANT® Implants effectively thicken cervical mucus within 24 hours after initiation. Therefore, if NORPLANT® Implants are inserted after the 7th day of the cycle in a woman who is at risk of pregnancy, it may be best for the woman to consider a back-up method or abstinence for up to 7 days.

What are the most common side effects of NORLANT® Implants?

The most common side effects for all progestin-only contraceptives (e.g., injectables, NORPLANT® Implants and progestin-only pills) include menstrual cycle disturbances, including irregular spotting or bleeding and amenhorrhea, because of their effect on the endometrium and on ovulation.

How long do NORPLANT® Implants work?

NORPLANT® Implants provide protection against pregnancy for 5 years. The progestin is released slowly and continually from the NORPLANT® Implants site.

How NORPLANT® Implants affect future fertility?

When the capsules are removed, no contraceptive effect remains. There is usually no delay in return to baseline fertility after removal of NORPLANT® Implants.

D. COMBINED CONTRACEPTIVES

1. Combined Oral Contraceptives (COCs)

COCs are pills that contain both synthetic estrogens and a progestin.

How do COCs work?

COCs work chiefly by:

1. consistently suppressing ovulation. When a woman takes COCs every day, her hypothalamus senses that the body's levels of estrogen and progesterone are already adequate. This causes negative feedback to the hypothalamus, and consequently, gonadotropin releasing factor (GnRF) is not released. In turn, the anterior pituitary gland does not make enough LH or FSH to cause maturation and ovulation of the dominant follicle.
2. keeping cervical mucus thick so that fewer sperm can pass through it. Since ovulation is not occurring, the follicle does not develop and produce enough estrogen to make “fertile mucus”.

In addition, due to low estrogen levels, the endometrium does not become rich and thick, and is not prepared for implantation. The menstrual flow is light.

When can COCs be started?

It is best to start COCs on the first day or within the first 5 days of the menstrual cycle. However, COCs may be started anytime the service provider can be reasonably sure the client is not pregnant.

If a postpartum woman is breastfeeding, she should be discouraged from using COCs. COCs should not be used in the first 6 weeks postpartum and are considered to be the method of **last** choice during any state of lactation, especially in the first 6 months postpartum. This is because even low dose (30 to 35 mcg) COCs decrease breastmilk production. However, if a breastfeeding woman does not wish to rely on LAM or use an alternative method, and she makes an informed choice to use COCs, COCs can be started anytime after 8 to 12 weeks postpartum (after breastfeeding is established) if she is still amenorrheic, or whenever the service provider can be reasonably sure that the woman is not pregnant. If a postpartum woman is **not** breastfeeding, she can begin COCs after the second to the third week postpartum, after blood coagulation and fibrinolysis levels from pregnancy have normalized, because the estrogens in COCs may affect their normalization.

COCs are safe and appropriate for use immediately postabortion (spontaneous or induced) in either the first or second trimester, and should be initiated within the first 7 days postabortion. (Hypercoagulability of pregnancy probably does not become clinically significant until the third trimester.) If started later than one week, COCs may not be immediately effective because the ovary resumes follicular development as soon as one week after a first trimester (spontaneous or induced) abortion.

When do COCs take effect?

The effect of COCs on cervical mucus is not as strong as the effect of progestin-only methods. COCs must be taken for 7 days to suppress development of follicular growth. If COCs are started after Day 7 of the cycle, it will be too late to suppress development of the dominant follicle and subsequent ovulation. In this case, the client must abstain or use a back-up method for 7 days.

What are the most common side effects of COCs?

The most common side effects for all combined contraceptives (e.g., combined oral contraceptives and combined injectable contraceptives) are nausea, breast tenderness and menstrual cycle disturbances, including spotting (or "break though bleeding") and absent bleeding.

How do COCs affect future fertility?

When the pills are stopped, there is almost no delay in return to baseline fertility for many women. Some women may have a delay of 3 or so months longer than it would have taken them if they had not taken COCs. Women who had irregular cycles and were subfertile **before** using COCs will resume irregular cycles (and still be subfertile) after stopping COCs.

2. Once-a-month Combined Injectable Contraceptives (CICs)

Once-a-month combined injectables contain both an estrogen and a progestin, and are administered on a monthly basis. As of 1997, two formulations of this type of injectable have been approved by the World Health Organization (WHO): Cyclofem and Mesigyna.

How do CICs work?

CICs work by consistently suppressing ovulation, similar to the contraceptive action of COCs. Because of the estrogen in CICs, they tend to produce regular monthly bleeding, while progestin-only injectables cause irregular (frequent or infrequent) bleeding. Because CICs contain both estrogen and progestin, they probably also affect the cervical mucus, making it thick so that sperm can not pass through.

When can CICs be started?

It is best to start CICs on the first day of the menstrual cycle or within the first 5 days of the menstrual cycle. However, CICs may be started anytime the service provider can be sure the client is not pregnant. The client should be told that a bleeding episode will occur after the first injection, usually within 10 to 15 days, due to the declining level of estrogen in the blood.

As with COCs, a postpartum woman who is breastfeeding should be discouraged from using CICs. Because CICs contain estrogen, which decreases breastmilk production, CICs should not be used in the first 6 weeks postpartum. These injectables should generally not be used during any state of lactation, especially in the first 6 months postpartum. (However, if a breastfeeding woman's best method choice is still a combined hormonal method, CICs may be preferable to

COCs because they contain a natural estrogen, as opposed to the synthetic estrogen found in COCs). If a breastfeeding woman does not wish to rely on LAM or use an alternative method, and she makes an informed choice to use CICs, the injectables can be started anytime after 8 to 12 weeks postpartum (after breastfeeding is established) if she is still amenorrheic, or whenever the service provider can be reasonably sure that the woman is not pregnant.

If a postpartum woman is **not** breastfeeding, she can begin CICs after the second to third week postpartum, after blood coagulation and fibrinolysis levels from pregnancy have normalized.

CICs are appropriate for use immediately postabortion (spontaneous or induced), in either the first or second trimester, and should be initiated within the first 7 days postabortion.

When do CICs take effect?

It is not proven when CICs take effect, but many experts believe CICs are similar to COCs. CICs may require up to one week to take effect completely.

What are the most common side effects of CICs?

The most common side effects for all combined contraceptives (e.g., combined oral contraceptives and combined injectable contraceptives) are nausea, breast tenderness and menstrual cycle disturbances, including spotting (or "break though bleeding") and absent bleeding.

How long do CICs last?

The effect of one injection lasts for 30 ± 3 days (27 to 33 days). Therefore, a client must return to the clinic every 27 to 33 days to receive her next injection. The manufacturer's instructions and service guidelines will provide precise information on the re-injection schedule.

How do CICs affect future fertility?

For women who have stopped using CICs after two years of use, about half of these women resumed ovulation within 3 months of discontinuing CICs.

Table 2: Overview of Hormonal Contraceptives

Contraceptive	When to Initiate Postpartum or Postabortion	Effectiveness After Initiation	Length of Action	Average Time for Return of Fertility
Progestin-only injectables	**If postpartum and not breastfeeding,** immediately. **If breastfeeding,** after 6 weeks. **If postabortion,** within the first 7 days.	Within 24 hours	DMPA: injection needed every 3 months NET-EN: injection needed every 2 months	DMPA: After stopping DMPA, about 7 months (10 months after the last injection) NET-EN: presumed to be no more than with DMPA
POPs (progestin-only pills)	**If postpartum and not breastfeeding,** immediately. **If breastfeeding,** after 6 weeks. **If postabortion,** within the first 7 days.	Within 24 hours	Effective while consistently taking pills daily	POPs are cleared from body in l day
NORPLANT® Implants	**If postpartum and not breastfeeding,** immediately. **If breastfeeding,** after 6 weeks. **If postabortion,** within the first 7 days.	Within 24 to 48 hours (if POP taken late, back-up method needed for at least 48 hours; 7 days advisable)	Effective for 5 years	After capsules are removed, no delay in baseline fertility
COCs (combined oral contraceptives)	**If postpartum and not breastfeeding,** 2 to 3 weeks postpartum. **If breastfeeding,** not recommended for first 6 months. **If postabortion,** within the first 7 days.	After 7 days	Effective while consistently taking pills	Usually no delay in baseline fertility (Some women have delay of about 3 months.)
CICs (combined once-a-month injectable contraceptives)	**If postpartum and not breastfeeding,** immediately. **If breastfeeding,** can be started 8 to 12 weeks postpartum, but not recommended until 6 months postpartum. **If postabortion,** within the first 7 days.	After 7 days	Combined once-a-month injection needed every 27 to 33 days	Usually no delay in baseline fertility (Some women have delay of about 3 months.)

E. INTRAUTERINE CONTRACEPTIVE DEVICE (IUD)

The IUD is a plastic device inserted in the uterine cavity for the purpose of preventing fertilization. There are two types currently in common use: IUDs with copper or other metals (to increase effectiveness) and progestin-releasing IUDs.

How does the IUD work?

According to new data, the copper-releasing IUDs work chiefly by preventing the progress of the sperm up through the uterus (which prevents the ovum from being fertilized). Progestin-releasing IUDs prevent pregnancy in the same manner, as well as thicken cervical mucus and suppress the build-up of the endometrium.

The copper-releasing IUD causes a sterile inflammatory response in the uterus. This sterile inflammatory response makes sperm incapable of fertilizing an egg and alters the uterus in such a way that fertilization cannot take place. This inflammatory response accounts for the increased amount of bleeding and cramping noted with IUDs during menstruation. While the amount of menstrual bleeding and cramping normally decreases over time with all IUDs, women using the copper-bearing IUDs generally have more menstrual bleeding and cramping than before they began using an IUD. However, women using the progestin-releasing IUDs have less bleeding and cramping than before using the IUD.

When can the IUD be inserted?

The IUD can be inserted anytime during the menstrual cycle (at the client's convenience) if the provider can be reasonably sure that the client is not pregnant. For some clients, it is easier to insert the IUD during menses or at mid-cycle, when the cervical canal and os are more open.

For a postpartum woman, an IUD may be inserted immediately post-placental; during or immediately after a Cesarean-section (special training is required); up to 48 hours postpartum prior to hospital discharge (special training is required); or as early as 4 weeks (for the Copper-T IUD) to 6 weeks (for other IUDs) postpartum, for women who come to the clinic for routine postpartum care requesting an IUD. IUDs can safely be used by breastfeeding women. When inserting IUDs at the routine 4 or 6 weeks postpartum visit, the withdrawal technique used for insertion of Copper-T and progestin-releasing IUDs presumably helps minimize perforations better than the “push technique” used with older IUDs.

IUDs may be inserted immediately or during the first 7 days postabortion (spontaneous or induced) if the uterus is not infected or traumatized. In the case of trauma or infection, IUD insertion should be postponed and a short-term method provided until the condition is treated and resolved. After 16 weeks gestation, the uterine cavity will be too enlarged for postabortion IUD placement to be accomplished by routine IUD insertion techniques. Only providers trained to do postpartum IUD insertion should perform immediate postabortion IUD insertion for postabortion clients after 16 weeks gestation.

When does the IUD take effect?

The IUD is effective immediately upon insertion as a contraceptive method.

What are the most common side effects of IUDs?

The most common side effects for copper IUDs are increased menstrual cramping and bleeding. Progestin-releasing IUDs are used to treat heavy or painful menses.

How long do IUDs work?

IUDs work as long as they are properly in place in the uterine cavity. The Copper-T 380A should be replaced after 10 years.

How do IUDs affect future fertility?

Studies have shown that when the IUD is removed for women who desire conception, there is usually no delay in return to baseline fertility.

F. VOLUNTARY SURGICAL CONTRACEPTION (VSC)

1. Tubal Ligation

Tubal ligation is a medical procedure for a woman in which small portions of the fallopian tubes (which transport the ovum) are cut, clipped or cauterized (burned). The resulting ends may be tied or burned.

How does tubal ligation work?

The man's sperm cannot reach the ovum to fertilize it.

Research has shown that tubal ligation does not have a definite effect on the menstrual cycle. A woman's body continues to produce hormones as usual and she continues to have her monthly menstruation. The ovum is released at ovulation, but stays in the fallopian tube and is reabsorbed.

Many practitioners prefer to offer tubal ligation after a woman has recently had her menstrual period to ensure she is not pregnant. A woman can have a tubal ligation immediately postpartum or immediately after a safe, hygienic first-trimester abortion (spontaneous or induced). Tubal ligation can be safely performed in breastfeeding women.

When does tubal ligation take effect?

Usually tubal ligation provides immediate protection against pregnancy, and therefore another contraceptive method is not needed. However, if the surgery is done during the middle of the menstrual cycle (day 10 to day 20), the ovaries may have already released an ovum into the uterus. Another method, such as condom and/or spermicides, should be used until the next menses.

What are the most common side effects of tubal ligation?

The most common side effects for both tubal ligation and vasectomy occur in the few days following the procedure. These side effects include pain, bleeding, bruising and infection. Later, the most common problem is regret, which should be avoided by careful counseling of potential VSC users.

How long does tubal ligation work?

Tubal ligation should be considered permanent.

2. Vasectomy

Vasectomy is a medical procedure in which the man's vas deferens (tubes) are cut, cauterized or blocked. While vasectomy prevents the union of sperm and ovum, it does not affect the woman's menstrual cycle or the man's ability to have an erection and ejaculation.

How does vasectomy work?

Sperm travels in the semen from the testes to the penis through the vas deferens. After a vasectomy, the sperm can no longer enter the semen that is ejaculated. The man will continue to ejaculate semen, but it will no longer contain sperm. Sperm are reabsorbed and do not accumulate or back-up. A man's sex drive is not affected because the procedure does not affect the hormone in the testes.

When does vasectomy take effect?

It usually takes at least 20 ejaculations to clear sperm from the man's vas deferens. Condoms or another contraceptive method should be used until then. After at least 20 ejaculations, the surest way to confirm sterility is to take a sample of semen for examination under a microscope to determine whether it still contains sperm.

What are the most common side effects of vasectomy?

The most common side effects for both tubal ligation and vasectomy occur in the few days following the procedure. These side effects include pain, bleeding, bruising and infection. Later, the most common problem is regret, which should be avoided by careful counseling of potential VSC users.

How long does vasectomy work?

A vasectomy should be considered permanent.

G. BARRIER CONTRACEPTIVE METHODS AND SPERMICIDES

Barrier contraceptive methods include condoms and diaphragms. These methods prevent the union of sperm and egg, but do not affect the woman's menstrual cycle. Some couples use barrier methods and spermicides only during the woman's fertile period. (In this case, the fertile period must be accurately predicted.) Barrier contraceptive methods also prevent STDs and AIDS when consistently used.

How do barrier contraceptive methods and spermicides work?

1. Condom

The condom is a sheath of thin latex that is placed on a man's erect penis before intercourse and removed afterwards. It collects the semen and keeps it from entering the woman's vagina during intercourse. (Female condoms have been developed, but are not widely available yet; these pockets of polyurethane cover the vagina and are held in place by a thin, flexible ring outside the vaginal opening.)

2. Spermicides

Spermicides, chemicals which kill sperm, are found in contraceptive creams, jellies, foaming tablets, films, and on some condoms. Nonoxynol-9 is a commonly-used spermicide. Spermicides are more effective in preventing pregnancy if used with other barrier methods.

3. Diaphragm

The diaphragm is a soft rubber cup with a stiff, but flexible, rim. A spermicide, such as contraceptive cream or jelly, is put on the inner surface of the diaphragm. The diaphragm is inserted into the woman's vagina before intercourse where it surrounds the cervix and blocks sperm from entering the woman's uterus. The diaphragm must stay in place for at least 6 hours after intercourse because sperm can stay alive in the vagina for up to 6 hours after intercourse. If intercourse is repeated, then a repeat application of spermicide is needed.

How long do barrier contraceptive methods work?

The condom, diaphragm and spermicides are effective for only one act of intercourse.

What are the most common side effects of barrier contraceptive methods and spermicides?

The most common side effects for barrier methods are skin irritations, repeated urinary tract and vaginal infections and allergies. The most common side effects associated with spermicides are allergies, sensitivity to the spermicidal agent, and yeast vaginitis.

When can barrier methods and spermicides be initiated postpartum and postabortion?

Postpartum and postabortion women can begin to use condoms (male or female) and spermicides as soon as they resume sexual activity. Postpartum women and women postabortion should wait at least 6 weeks (for uterine involution) to begin using diaphragms. Barrier methods and spermicides can be safely used by breastfeeding women.

H. EMERGENCY CONTRACEPTIVE PILLS (ECP)

Emergency contraceptive pills (ECP) contain the same hormones used in combined and progestin-only oral contraceptives. However, they are used differently.

How do ECPs work?

Depending on when ECP is used during the menstrual cycle, the pills will either:

- stop the release of an ovum,
- prevent fertilization of an ovum, or
- stop a fertilized ovum from becoming attached to the uterus.

When should ECPs be taken?

A single dose of the pills should be taken as soon after intercourse as possible, but no later than 72 hours after unprotected intercourse. A second dose should be taken 12 hours after the first dose. Some examples of when ECP may be offered to clients include after rape, incest, forgetting to take their OCs, or after a barrier method failure.

When do ECPs take effect?

The pills are absorbed into the blood within three hours of each of the doses.

What are the most common side effects of ECPs?

The most common side effects of ECPs are nausea and vomiting. The side effects generally do not last more than 24 hours.

How long do they work?

If a woman has unprotected intercourse *after* using ECPs, they do not prevent pregnancy.

STUDY QUESTIONS

Instructions: The following questions can be used for trainers' self-study or for review sessions with trainees.

- Answer all of the questions on a separate sheet of paper.
- Study the answers to the questions you did not know. The answers can be found on the page following the last question.
- For trainee reviews, use the questions as objective test items or in a "grab bag" session with questions written on index cards.

1. Cervical Mucus Method (CCM)
   a. How does a woman predict her fertile period using the cervical mucus method (CCM)?
   b. How does estrogen affect cervical mucus?
   c. How does progesterone affect cervical mucus?
   d. To avoid pregnancy, what days of the menstrual cycle should a couple abstain from sexual intercourse if they are using the CCM?

2. Calendar Method
   a. How does the calendar method work?
   b. How many previous menstrual cycles should a woman use to predict the fertile period using the calendar method?
   c. How long can sperm live in the woman's cervical canal?
   d. What is the last day of the menstrual cycle that a woman is fertile?
   e. How long is the typical Progesterone Phase of the menstrual cycle? Why is this important to know in calculating the “Minus 20 Rule”?
   f. Explain the “Minus 20 Rule”.
   g. Explain the “Minus 11 Rule”.

3. Basal Body Temperature (BBT)
   a. How does a woman predict her fertile period using the Basal Body Temperature (BBT)?
   b. What happens to the BBT after ovulation?
   c. If a woman is using the BBT method, when can she be sure ovulation has passed and she is no longer fertile?
   d. What days of the menstrual cycle should a couple abstain from sexual intercourse if they are using the BBT method?

4. What is the Symptothermal Method?

STUDY QUESTIONS (continued)

5. Lactational Amenorrhea Method (LAM)
   a. What 3 conditions must be met for a woman to be "fully breastfeeding"?
   b. What hormones are decreased by the frequent suckling of breastfeeding?
   c. What are the three LAM criteria?

6. Progestin-only Injectable Contraceptives
   a. How do progestin-only injectable contraceptives prevent pregnancy?
   b. What hormones do progestin-only injectable contraceptives mimic?
   c. When does a progestin-only injectable contraceptive become effective after a client receives it?
   d. How often should DMPA be given? How often should NET-EN be given?
   e. How long does it take before baseline fertility returns after stopping progestin-only injectable contraceptives?

7. Progestin-only Pills (POPs)
   a. How do POPs work?
   b. Why is it important for women using POPs to take the pill every day at the same time?
   c. When do POPs become effective after they are initiated?
   d. How long does it take for baseline fertility to return using POPs?

8. NORPLANT® Implants
   a. What are NORPLANT® Implants?
   b. How do NORPLANT® Implants work?
   c. When do NORPLANT® Implants become effective?
   d. How long do NORPLANT® Implants work?
   e. How long does it take after NORPLANT® Implants are removed for baseline fertility to return?

9. Combined Oral Contraceptives (COCs)
   a. What are COCs?
   b. How do COCs work?
   c. How long do COCs work?
   d. When do COCs become effective?

STUDY QUESTIONS (continued)

10. Once-a-month Combined Injectable Contraceptives (CICs)
    a. What are CICs?
    b. How do CICs work?
    c. What is the main advantage of combined injectables over progestin-only injectables?
    d. How long does one injection of CICs last?
    e. How long does it take after CICs are stopped for baseline fertility to return?

11. Intrauterine Contraceptive Device (IUD)
    a. What is the IUD?
    b. How do IUDs (Copper T and progestin-releasing) work?
    c. When should IUDs (Copper T and progestin-releasing) be replaced?
    d. How long does it take for baseline fertility to return after the IUD is removed?

12. Tubal Ligation
    a. What is tubal ligation?
    b. How does tubal ligation work?
    c. Does tubal ligation affect the menstrual cycle?
    d. How long does tubal ligation work?

13. Vasectomy
    a. What is a vasectomy?
    b. How does it work?
    c. Does a vasectomy affect a man's sex drive?

14. Barrier Contraceptives
    a. What are 2 barrier contraceptive methods? How do they work?
    b. How long are barrier contraceptive methods and spermicides effective?

15. Emergency Contraceptive Pills (ECPs)
    a. What do ECPs consist of?
    b. How soon after unprotected intercourse should ECPs be taken for best effect?
    c. How do they work?

ANSWERS TO STUDY QUESTIONS

1. Cervical Mucus Method (CCM)
   a. A woman using the CCM predicts the fertile period through daily self-observation of the changes in quantity and consistency in the cervical mucus during the course of the menstrual cycle.
   b. When the concentration of estrogen in the bloodstream increases to reach its maximum, the cervical mucus increases in amount and changes to a clear, slippery and stretchy substance. This mucus nourishes sperm and helps it to travel into the uterus.
   c. Progesterone inhibits the production of cervical mucus. The mucus usually decreases in amount and becomes cloudy, thick and sticky again -- and thus less penetrable by sperm.
   d. In order to avoid pregnancy, a couple using the CCM must abstain from sexual intercourse or use barrier methods on all days which the woman notices the presence of mucus and until the fourth day after the "peak symptom day". (The "peak symptom day" is the last day of wet, stretchy, slippery, fertile mucus.)

2. Calendar Method
   a. A woman using the calendar method predicts the fertile period by calculations based on the length of at least 6 previous menstrual cycles. These calculations take into account how long sperm and ova usually live and when ovulation is likely **not** to occur.
   b. At least 6 menstrual cycles should be used.
   c. Some sperm can survive and fertilize for up to 4 days.
   d. The last day of the cycle that a woman is fertile is the day after ovulation.
   e. The Progesterone Phase may be 12 to 16 days long. This is important to know in order to determine the earliest day a woman could become pregnant. For example, in a 28-day cycle, a woman could ovulate as early as Day 28 **minus 16** = Day 12 = the earliest likely day of ovulation.
   f. After intercourse, most sperm live about 3 days, but there is about a 10% chance that a 4 day old sperm can successfully fertilize an ovum. The chance of pregnancy exists when live sperm are present at the time of ovulation or during the 24 hours after ovulation. (The ovum is alive and can still be fertilized during this time period).

      Ovulation occurs at the end of the Estrogen Phase. The Progesterone Phase is typically **12** to **16** days long. Thus, in a 28-day cycle, a woman could ovulate as early as Day 28 **minus 16** = Day 12 = the earliest likely day of ovulation.

      Since some sperm can survive and fertilize for **4** days, Day 12 (ovulation) **minus 4** = Day 8 = earliest day on which intercourse could likely result in pregnancy.

ANSWERS TO STUDY QUESTIONS (continued)

f. (continued)

Since subtracting 16 days and 4 days from the last day of the cycle is the same as subtracting 20 days from the last day of the shortest cycle, this is the "Minus 20 Rule".

g. The last day of the cycle that a woman is fertile is the day after ovulation. Since ovulation can occur as late as 12 days before the next menses, subtract **11** from the length of the longest cycle to find the last possible day that intercourse could result in pregnancy.

3. Basal Body Temperature (BBT)
   a. A woman using the BBT method predicts the fertile period by charting her resting temperature every day and noting the rise in temperature caused by ovulation.
   b. After ovulation, increased progesterone levels will cause the BBT to rise about 0.2 to 0.5 degree centigrade (0.5 to 1.0 degree Fahrenheit).
   c. When the BBT has remained elevated for 3 days, the woman is assured ovulation has passed.
   d. When a couple uses this method, they should abstain from sexual intercourse or use a barrier method from day 1 of the menstrual cycle until 3 days after the temperature increases.

4. The STM combines the cervical mucus method (CMM) and the basal body temperature method (BBT) to predict the fertile period.

5. Lactational Amenorrhea Method (LAM)
   a. "Fully or nearly fully breastfeeding" means breastfeeding on demand on both breasts with no 2 feedings more than 4 hours apart during the day or 6 hours apart during the night. Food or liquid must not be given regularly to the baby as substitutes for breast milk meals.
   b. Frequent suckling decreases the secretion of GnRF (gonadotropin releasing factor) by the hypothalamus. This, in turn, suppresses the anterior pituitary gland's secretion of the LH surge required for ovulation.
   c. 1. The woman must be in the first 6 months postpartum.
      2. The woman must be fully or nearly fully breastfeeding.
      3. The woman must be amenorrheic (not having menstrual bleeding). Bleeding occurring in the first 56 days postpartum is not considered menstrual bleeding.

6. Progestin-only Injectable Contraceptives
   a. They prevent pregnancy chiefly by:
      1. consistently suppressing ovulation. They cause "negative feedback" to the pituitary gland by providing high levels of progestins which block the release of both FSH and LH.

ANSWERS TO STUDY QUESTIONS (continued)

2. causing cervical mucus to remain too thick for sperm to reach the uterus.

b. Progestin-only Injectable contraceptives contain synthetic progestins, which are similar to the human progesterones in a woman's body.

c. Experts believe that progestin-only injectables effectively thicken cervical mucus within 24 hours after initiation. Therefore, if injectables are begun after the seventh day of the cycle, it would be best for a woman to abstain or use a back-up method for up to 7 days.

d. NET-EN needs to be given every 2 months; DMPA, every 3 months.

e. After discontinuing DMPA, about 50% of women conceive by 7 months (i.e., 10 months after the last injection).

7. Progestin-only pills (POPs)

a. They work chiefly by:

1. causing cervical mucus to become too thick for sperm to reach the uterus. (This is probably the most important mechanism.)

2. suppressing ovulation. (This does not occur in all cases.)

b. Because the effect of each POP on cervical mucus is very short lived (a little under 24 hours), it is very important that women take POPs every day at the same time.

c. Experts believe that POPs effectively thicken cervical mucus 24 hours after initiation. Experts believe the contraceptive effect of POPs on cervical mucus is complete by 48 hours after initiation (by the time the third pill is taken).

d. POPs are largely cleared from the body within one day. When the pills are stopped, there is almost no delay in return to baseline fertility.

8. NORPLANT® Implants

a. NORPLANT® Implants are small plastic capsules filled with synthetic progestins. They are inserted under the skin on the inside of a woman's upper arm. The progestin is slowly released into the woman's body.

b. NORPLANT® Implants work chiefly by:

1. making the woman's cervical mucus too thick for sperm to pass through.

2. suppressing ovulation.

In addition, NORPLANT® Implants cause the lining of the uterus to become less rich in blood vessels and unprepared for an ovum to implant.

c. Experts believe that NORPLANT® Implants effectively thicken cervical mucus within 24 hours after initiation. Therefore, if NORPLANT® Implants are inserted after the seventh day of the cycle in a woman who is at risk of pregnancy, it may be best for the woman to consider a back-up method or abstinence for up to 7 days.

ANSWERS TO STUDY QUESTIONS (continued)

d. NORPLANT® Implants provide protection against pregnancy for 5 years.

e. There is usually no delay in return to baseline fertility after removal of NORPLANT® Implants.

9. Combined Oral Contraceptives (COCs)

a. COCs are pills that contain both an estrogen and a progestin.

b. COCs work chiefly by:

1. consistently suppressing ovulation. When a woman takes COCs every day, her hypothalamus senses that the body's levels of estrogen and progesterone are already adequate. This causes negative feedback to the hypothalamus, and gonadotropin releasing factor (GnRF) is not released. In turn, the anterior pituitary gland does not make enough LH or FSH to cause maturation and ovulation of the dominant follicle.

2. keeping cervical mucus thick so that fewer sperm can pass through it. Since ovulation is not occurring, the follicle does not develop and produce enough estrogen to make "fertile mucus".

   In addition, due to low estrogen levels, the endometrium does not become rich and thick, and is not prepared for implantation. The menstrual flow is light.

c. COCs work as long as a woman continues to take them every day. When the pills are stopped, there is almost no delay in return to baseline fertility for many women. However, some women may have a delay of 3 or so months longer than it would have taken them if they had not taken COCs.

d. COCs must be taken for 7 days to suppress development of follicular growth. If COCs are started after Day 7 of the cycle, it will be too late to suppress development of the dominant follicle and subsequent ovulation. In this case, the client must abstain or use a back-up method for 7 days.

10. Once-A-Month Combined Injectable Contraceptives (CICs)

a. CICs are injectables that contain both an estrogen and a progestin, and are administered on a monthly basis. Two formulations of this type of injectable have been approved by the World Health Organization (WHO): Cyclofem and Mesigyna.

b. CICs work by consistently suppressing ovulation, similar to the contraceptive action of COCs. Because CICs contain both estrogen and progestin, they probably also affect the cervical mucus, making it thick so that sperm cannot pass through.

c. Combined injectables tend to provide regular monthly bleeding, while progestin-only injectables cause irregular (frequent or infrequent) bleeding.

d. The effect of one injection lasts for 30 ± 3 days (27 to 33 days). Therefore, a client must return to the clinic every 27 to 33 days to receive her next injection.

ANSWERS TO STUDY QUESTIONS (continued)

e. For women who stop using CICs after 2 years of use, about half of them resume ovulation within 3 months of discontinuing CICs.

11. IUD

a. The IUD is a plastic device inserted in the uterine cavity for the purpose of preventing fertilization. There are two types currently in common use: IUDs with copper or other metals (to increase effectiveness) and progestin-releasing IUDs.

b. According to new data, the copper-releasing IUDs work chiefly by preventing the progress of the sperm up through the uterus (which prevents the egg from being fertilized). In addition, progestin-releasing IUDs thicken cervical mucus and suppress the build-up of the endometrium.

The copper-releasing IUD causes a sterile inflammatory response in the uterus. This sterile inflammatory response renders sperm incapable of fertilizing an egg and alters the uterus in such a way that fertilization cannot take place.

c. IUDs work as long as they are properly in place in the uterine cavity. The Copper-T 380A should be replaced after 10 years.

d. When the IUD is removed, there is usually no delay in return to baseline fertility.

12. Tubal Ligation

a. Tubal ligation is a medical procedure for a woman in which small portions of the fallopian tubes (which transport the egg) are cut, clipped or burned. The resulting ends may be tied or burned.

b. The man's sperm cannot reach the egg to fertilize it.

c. Research has shown that tubal ligation does not have a definite effect on the menstrual cycle. A woman's body continues to produce hormones as usual and she continues to have her monthly menstruation. The ovum is released at ovulation, but stays in the fallopian tube and is reabsorbed.

d. Tubal ligation should be considered permanent.

13. Vasectomy

a. Vasectomy is a medical procedure in which the man's tubes (the vas deferens) are cut, burned, or blocked.

b. While vasectomy prevents the union of sperm and egg, it does not affect the woman's menstrual cycle or the man's ability to have an erection and ejaculation.

c. A vasectomy does not affect a man's sex drive.

14. Barrier Contraceptives

a. Barrier contraceptive methods include condoms and diaphragms. These methods prevent the union of sperm and egg, but do not affect the woman's menstrual cycle.

ANSWERS TO STUDY QUESTIONS (continued)

b. The condom, diaphragm and spermicides are effective for only one act of intercourse.

15. Emergency Contraceptive Pills (ECP)

a. ECPs consist of COCs (2 high dose or 4 low dose COCs are taken as soon after unprotected intercourse as possible, with the dose repeated after 12 hours). POPs also have been used effectively as ECPs, but the required dose is higher.

b. ECPs must be taken within 72 hours of unprotected intercourse for highest efficacy.

c. Depending on when ECP is used during the menstrual cycle, the pills will either:

- stop the release of an ovum,
- prevent fertilization of an ovum, or
- stop a fertilized ovum from becoming attached to the uterus.

PART III:

APPLYING KNOWLEDGE OF THE MENSTRUAL CYCLE TO THE MANAGEMENT OF FP CLIENT CONCERNS

LEARNING OBJECTIVE

After reading Part III, the trainer will be able to apply her knowledge of the changes that occur in the menstrual cycle by responding to selected cases of family planning (FP) clients with problems or questions about contraceptive methods.

INTRODUCTION

This section contains 21 case examples which can be used to help RH service providers learn to respond appropriately to clients' questions and concerns. The case examples are divided into five categories of commonly encountered FP client concerns. The categories are:

A. method initiation (5 case examples)
B. method switching (4 case examples)
C. bleeding/spotting (6 case examples)
D. amenorrhea (3 case examples)
E. forgotten pills or forgotten re-injection date (3 case examples)

When practicing responding to client concerns, the trainer should ensure that the trainees also use the appropriate client/provider interaction and counseling skills.

Based on her/his own experience, the trainer may develop other case situations that will provide practice in applying knowledge of the changes that occur in the menstrual cycle to the management of these and other problems or concerns of FP clients.

A. METHOD INITIATION

CASE A-1: Client requests combined oral contraceptives (COCs) mid-cycle.

A 17 year-old client who has not had any children wants to begin COCs today. Her last normal menstrual period was 2 weeks ago. She states that she has not had sexual intercourse in the last 2 weeks while her partner has been out of town, but she is worried about getting pregnant when her partner comes home next week. She comes to the clinic seeking advice.

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
Since the client has been abstaining for the last 2 weeks (following a normal menses), she is not yet at risk for pregnancy. She is on or near day 14 of her menstrual cycle. After day 5 of the menstrual cycle, the ovarian follicle is already beginning to develop. If COCs are started after day 5, it may be too late to effectively block ovulation on day 12 (fertile ovulations rarely occur before day 12). This development of the dominant follicle and ovulation will occur whether or not a client has had sexual intercourse in the first 2 weeks of her menstrual cycle.	Explain to the client that it is **best** to start the pill on the first day of the menses, and certainly within the first 5 days of the first day of bleeding. By history, verify that the client does not have any conditions which would make her ineligible to use COCs. (If there are signs or symptoms of such conditions, perform or refer her for the relevant physical exam or laboratory tests.) Dispense COCs to her today (if appropriate), along with a barrier method. Advise her to abstain from intercourse or use the barrier method until the first day of her next menses. Advise her to begin her COCs the first day of her next menses. Tell her if she insists on starting COCs mid-cycle against your advice, she **must** use a back-up method (or abstain) for at least 7 days, because it takes 7 days for COCs to become effective. Alert her that some break-through bleeding (bleeding at a time in the pill cycle other than during the 4th week) will likely occur this first month.	COCs work chiefly by preventing ovulation, thickening cervical mucus, and thinning the uterine lining. To be effective, COCs must be taken for at least 7 consecutive days in order to prevent development of the ovarian follicle and ovulation. Whenever COCs are begun after the seventh day of the cycle (or whenever 2 or more pills are missed), the client must abstain or use a back-up method until she has been taking COCs for at least 7 days. Since the client's last menstrual period was 2 weeks ago, she may be near ovulation. It is too late to prevent ovulation by initiating COCs today.[1,2] Furthermore, if she begins COCs mid-cycle, she is more likely to experience irregular bleeding the first month.

CASE A-2: Client requests NORPLANT® Implants on day 7 of her cycle.

A 33 year-old mother of 3 comes to the clinic today, because the nurse told her that today is the NORPLANT® Implants insertion day. She is not using any method of contraception. She is on day 7 of her menstrual cycle. She has already been counseled about NORPLANT® Implants and understands their main advantages and disadvantages.

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
By day 7 of the menstrual cycle, the dominant follicle is formed, but fertile ovulation very rarely occurs before the 12th day of the cycle.[3] Because very few fertile ovulations occur before day 12, and because sperm are typically capable of fertilizing for only 3 days after intercourse,[4] intercourse on or before the 6th day of the cycle is highly unlikely to result in pregnancy.[5,6]	By taking the client's history, verify that she does not have any conditions which would make her ineligible to receive NORPLANT® Implants (if there are signs or symptoms of such conditions, perform or refer her for the relevant physical exam or laboratory tests). Explain the procedure to her and remind her of the potential side effects (e.g., bleeding). Tell her that she must agree to either abstain or use a barrier method, such as condoms, for at least 24 hours until the NORPLANT® Implants can take effect. (Some programs may choose to recommend that she abstain or use a barrier method for up to 7 days.)	NORPLANT® Implants work chiefly by thickening cervical mucus and suppressing ovulation. Its contraceptive effect is thought to occur within 24 hours.[7] While it is best to insert NORPLANT® Implants within the first 5 days of the menstrual cycle, up to Day 7 is acceptable because of the low risk of pregnancy and the probable rapid onset of NORPLANT® Implants' action on the cervical mucus. Abstinence or a back-up method would not be necessary if the NORPLANT® Implants were inserted before Day 7 of the menstrual cycle. Intercourse before the seventh day of the cycle is highly unlikely to result in pregnancy.[3,4,5] However, the risk of pregnancy begins to rise when intercourse occurs after Day 7 of the cycle. Therefore, it is safest for the client to use a back-up method for at least 24 hours until the NORPLANT® Implants can take effect.

CASE A-3: Client requests tubal ligation on day 7 of her cycle.

A 44 year-old married mother of 6 has waited a long time for the monthly voluntary surgical contraception (VSC) clinic, and is hoping to receive a tubal ligation today. Her husband will not use condoms, and she is afraid of all other methods. Today is day 7 of her menstrual cycle; her menses arrive every 21 days. She has been counseled about tubal ligation, has no conditions which would make her ineligible for VSC and has signed the informed consent form.

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
By day 7 of the menstrual cycle, the dominant follicle is formed, but fertile ovulation very rarely occurs before the 12th day of the cycle, even in short cycles.[3] For very short cycles, the usual rule about ovulation occurring 14 days before the onset of menstruation does not hold true. In short cycles, the estrogen phase (during which the dominant follicle develops and ovulation occurs) is less variable than in long cycles. The progesterone phase is more variable and shorter.[8]	Explain to the client that the procedure can be performed today (or any day when one is sure the client is not already pregnant).	It can be assumed that ovulation (and travel of the ovum down the fallopian tube into the uterus) has not yet occurred by day 7. Therefore, intercourse before the 7th day of the cycle is highly unlikely to result in pregnancy,[3,4,5] and VSC can be performed today.[9] The client will not need a back-up method because tubal ligation is effective immediately.

CASE A-4: Amenorrheic breastfeeding client requests injectables at 10 months postpartum.

A 10 months postpartum, breastfeeding client has walked to this rural clinic carrying her baby in hopes of receiving Depo-Provera®. She had slight bleeding at about one month postpartum and none since. She breastfeeds the baby every 4 hours during the day and every 6 hours at night. The client says her husband is not willing to use condoms. She denies any symptoms of pregnancy. The clinic only meets once a month, she has been counseled about the advantages, disadvantages and side effects of Depo-Provera® and she very much wants an injection today. By history, she has no conditions which make her ineligible for Depo-Provera® use.

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
During the first 6 months postpartum, a client who is fully or nearly fully breastfeeding and amenorrheic (without menstrual periods) is 98% protected against pregnancy, due to suppression of ovulation caused by frequent suckling.[10] Fulfillment of these 3 criteria (less than 6 months postpartum, fully breastfeeding and amenorrheic) is known as the lactational amenorrhea method (LAM). (In a breastfeeding client, bleeding during the first 8 weeks postpartum is **not** considered menstrual bleeding, because ovulation has not occurred yet.) Breastfeeding at least 6 to 8 times per day, including nighttime feedings,[11] is considered intensive breastfeeding. Clients who are amenorrheic and breastfeed 10 times per day are at the least risk of ovulation. The protection against pregnancy from lactational amenorrhea decreases after 6 months postpartum because: 1. the frequency of suckling usually decreases as the mother is supplementing her breastfeedings more, and therefore 2. there is an increased risk of ovulation occurring before her menses return. However, the average duration of postpartum lactational amenorrhea in sub-Saharan Africa is about 13 months.[11] It is likely to be longest in poorly nourished clients and clients who are consistently breastfeeding.[12] In these circumstances where clients intensively breastfeed well beyond 6 months, LAM alone may be relied upon for contraception.	Explain to the client that if she is breastfeeding at least 6 to 8 times per day and if her menses have not returned, she is at low risk for pregnancy. Explain to her that since there is a very small risk she could be pregnant, you would like to examine her (to rule out pregnancy beyond 6 weeks). Explain that if by chance she is pregnant and receives Depo-Provera®, no harm will come to the developing baby. Since she has come all this way to the clinic, if you find no evidence of pregnancy, give her the Depo-Provera® she requests today. Explain to the client that as she introduces solid foods to her infant, it is important to continue breastfeeding. Emphasize that she should offer the breast first (before other foods) at each meal. Explain that Depo-Provera® in the breast milk is safe for the nursing baby.	The client requests Depo-Provera® today, and clients are most likely to correctly and consistently use the method of their first choice.[13] Initiation of a contraceptive method now should protect her from the return of ovulation. However, there is a very small chance that she could be pregnant because in the second 6 months postpartum, a client is likely to ovulate before her first menstrual period.[14] Progestin-only methods are preferred over estrogen-containing methods for breastfeeding clients who need additional contraception. Estrogen may decrease the milk supply.[15]

CASE A-5: Amenorrheic breastfeeding client requests intrauterine contraceptive device (IUD) insertion at 5 months postpartum.

At 5 months postpartum, a breastfeeding client comes to a family planning (FP) clinic, saying she has heard about the IUD. Her sister is happy with one, the client's husband is faithful to her and she to him, and the client wants the IUD. Since giving birth she has not had return of menses, although she did bleed slightly off and on in the first 6 weeks after delivery. In addition to breastfeeding 6 to 8 times per day, the baby takes some sips of water and has just started taking some spoonfuls of cereal and fruit. The client is afraid that hormonal contraceptives will give her headaches. She has been counseled about IUDs, understands their advantages and disadvantages, and is not interested in other methods. She denies any symptoms of pregnancy or other conditions which would make her ineligible to receive the IUD.

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
During the first 6 months postpartum, a client who is fully or nearly fully breastfeeding and amenorrheic (without menstrual periods) is 98% protected against pregnancy, due to suppression of ovulation caused by frequent suckling.[10] Fulfillment of these 3 criteria (less than 6 months postpartum, fully breastfeeding and amenorrheic) is known as the lactational amenorrhea method (LAM). (In a breastfeeding client, bleeding during the first 8 weeks postpartum is **not** considered menstrual bleeding, because ovulation has not occurred yet.)	Explain to the client that it is good for her and for her baby that she continue breastfeeding. Tell her that she is at very low risk for pregnancy because her baby is less than 6 months old, she has not yet had her menses, and she is still intensively breastfeeding. Give her an IUD after taking her history and performing a physical and pelvic exam to screen for conditions which would make her ineligible to receive the IUD. A pregnancy test is **not** necessary since she is intensively breastfeeding and her menses have not returned. Praise her continued breastfeeding, advise on introducing proper weaning foods, and recommend breastfeeding before each supplemental feeding.	It is very important to avoid IUD insertion during pregnancy, because approximately half of all pregnancies with an IUD in place end in a septic abortion (infection with miscarriage). Pregnancy tests are not necessary when an IUD is requested in the case of amenorrheic breastfeeding clients (who deny any symptoms of pregnancy and who are intensively breastfeeding) in the first 6 months postpartum because the lactational amenorrhea method (LAM) is 98% effective when these 3 criteria are fulfilled.[10]

B. METHOD SWITCHING

CASE B-1: Breastfeeding client chooses lactational amenorrhea method (LAM).
A breastfeeding client is seen at her 6 week postpartum check. She says that she and her husband have resumed sexual activity. She has had some bloody vaginal discharge this week and is worried that breastfeeding alone won't provide adequate contraceptive protection. She is fully breastfeeding (giving no supplements which substitute for breastfeeding meals). She is home with her baby, and breastfeedings are no more than 4 hours apart during the day and no more than 6 hours apart during the night. She has not heard of the "lactational amenorrhea method" (LAM).

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
Frequent nipple stimulation from breastfeeding suppresses the secretion of GnRF (gonadotropin releasing factor) from the hypothalamus. As a result, secretions of follicle stimulating hormone (FSH) and luteinizing hormone (LH) from the anterior pituitary gland are decreased, and ovulation does not occur.[16] During the first 6 months postpartum, a client who is fully or nearly fully breastfeeding and amenorrheic (without menstrual periods) is 98% protected against pregnancy. These criteria (less than 6 months postpartum, fully breastfeeding and amenorrheic) are known as the lactational amennorhea method (LAM). (In a breastfeeding client, bleeding in the first 8 weeks postpartum is not considered to be menstrual bleeding, because ovulation has not occurred yet.) The protection against pregnancy from lactational amenorrhea decreases after 6 months postpartum for 2 reasons: 1. the frequency of suckling usually decreases as the mother is supplementing her breastfeedings more, and therefore 2. there is an increased risk of ovulation occurring before her menses return.	Explain to the client that as long as she is fully or nearly fully breastfeeding and her menses have not yet returned, she may choose to rely on the LAM as a contraceptive method. If she regularly replaces a breastmilk meal with other foods or increases the interval between feedings to greater than 4 hours during the day and greater than 6 hours during the night, the LAM becomes less effective. She will need another contraceptive method when her menses return or sometime during the second 6 months postpartum when she is no longer intensively breastfeeding (at least 6 to 8 times per day). Therefore, explain some possible choices to her now. She may wish to take some contraceptive supplies with her now, to begin using when she is no longer able or chooses not to rely on LAM.	As the client's baby grows older and the client begins to regularly substitute other food or drink for breastfeeding meals, the frequency of suckling decreases. When this occurs, ovulation is no longer suppressed. The menstrual cycle resumes, and the client will need another contraceptive method. It is not recommended to rely on LAM beyond 6 months postpartum because the return of ovulation will likely occur before the woman has her first menses, putting her at risk for pregnancy. However, the use of "extended LAM" (beyond 6 months) is under study in places where women typically intensively breastfeed throughout the second 6 months postpartum.

CASE B-2: Intrauterine contraceptive device (IUD) user at mid-cycle requests a switch to combined oral contraceptives (COCs).

A 27 year-old mother of 2 children comes to a busy urban clinic requesting removal of her IUD. She has been counseled about the advantages and disadvantages of COCs. By history, she has no conditions which would make her ineligible to use COCs. She asks to begin using COCs as soon as the IUD is removed. The client's last normal menses began 13 days ago.

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
You can reasonably assume that an IUD user with regular menses is not pregnant. IUD users ovulate normally. On day 13 of her menstrual cycle, this client may well be near ovulation.	Help the client make an informed choice. Counsel the client to consider keeping her IUD for 2 more weeks, since COCs would not be immediately effective, if started mid-cycle. If she strongly prefers to have the IUD removed today, remove the IUD and provide her with COCs to start on the first day of her next menses. Counsel her to either abstain or use condoms and/or foam until her next menses. If she insists on starting her COCs today, she must use a back-up method for at least 7 days, because it takes 7 days for COCs to become effective. Alert her that some break-through bleeding (bleeding at a time in her pill cycle other than during the 4th week) will likely occur this month.	COCs work chiefly by suppressing ovulation. A client must take COCs for 7 days to suppress development of the ovarian follicle. Since the client is already on day 13 of her cycle, it is too late for the COCs to block ovulation this month.[1,2] If COCs are started after day 7 of the cycle, a back-up method or abstinence must be used for 7 days. IUD removal slightly dilates the cervical canal for a short period of time. Advising the client to abstain (or use condoms and/or foam) for at least one week may also help prevent infection and give a greater margin of safety to pregnancy prevention.

CASE B-3: Amenorrheic Depo-Provera® user requests an intrauterine contraceptive device (IUD).
A 25 year-old mother of 5 children, who is amenorrheic, comes to the clinic stating she is tired of Depo-Provera® because she thinks it makes her fat. She wants an IUD inserted today. She has been counseled about IUDs and understands the advantages and disadvantages. She denies risk of sexually transmitted diseases (STDs). By history, she has no conditions which would make her ineligible to use IUDs. Her last injection of Depo-Provera® was 12 weeks ago.

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
Amenorrhea (absent menses) is normal with Depo-Provera®. In fact, half of Depo-Provera® users will develop amenorrhea by the end of the first year, and two-thirds by the end of the second year.[17]	Explain to the client that since she had Depo-Provera® 3 months ago, she does not need a pregnancy test to verify that she is not pregnant. Since by history she is eligible to receive the IUD, if her pelvic exam today shows no conditions (e.g., infection, pregnancy) which would make her ineligible, insert one today. Let her know that sometimes it is slightly more difficult to insert an IUD in a client who is not having her menstrual period. Explain that you will do the procedure very gently and carefully, and that you will stop if any difficulties arise. If any difficulties arise, stop the insertion procedure immediately. Give the client a pack of oral contraceptives and ask her to return at the time of her menstrual period when the cervical canal will be more open.	Depo-Provera® is highly effective; reinjection is needed every 3 months (12 weeks) with a grace period of 2 weeks (and possibly up to 4 weeks depending on the population.) IUD insertion should always be done slowly and gently. It is reasonable to attempt gentle IUD insertion in an amenorrheic client requesting an IUD, since the insertion is quite likely to be successful.

CASE B-4: Breastfeeding client who takes progestin-only pills (POPs) asks about switching to combined oral contraceptives (COCs) when she stops breastfeeding.

A breastfeeding client with a 6 month old baby plans to wean her baby in 2 months. She wants to continue using POPs until she and her husband plan their next child. A nurse told her that when her baby became 6 months old, she must switch from POPs to COCs. She understands the advantages and disadvantages of POPs versus COCs and prefers POPs (because she says COCs gave her headaches).

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
POPs work chiefly by making the cervical mucus too thick for sperm to easily pass through. POPs also prevent the endometrium from thickening. POPs suppress ovulation much of the time.[18] POPs are very effective if taken at the same time every day, for both breastfeeding and non-breastfeeding women. Because breastfeeding amenorrheic women are already temporarily subfertile, such women can be particularly confident they are protected from pregnancy by POPs.	Explain to the client that she can continue using POPs if she prefers them to COCs. POPs are very effective **if** she takes her pill at the **same time every day.** If she misses even one pill, the effectiveness of POPs is greatly decreased. If she ever forgets a pill, advise her to start taking them again as soon as she remembers and to use a back-up method for at least 2 days.	The progestin dosage in POPs is about one-third the dose in COCs. (Fortunately, since women in lactational amenorrhea are temporarily subfertile, their risk of pregnancy from a forgotten pill is not as high as the risk for women who are not in lactational amenorrhea.) A forgotten POP is more likely than a forgotten COC to result in pregnancy. Although the effect of the POPs on cervical mucus occurs within 3 to 4 hours after taking them, it may take up to 48 hours to restore the POPs' effect on cervical mucus. If even one pill is forgotten, use of a back-up method is required for at least 2 days (and some programs choose to recommend up to 7 days of abstinence or back-up contraception).

C. BLEEDING/SPOTTING

CASE C-1: Intrauterine contraceptive device (IUD) user complains of heavy menses.

A 39 year-old mother of 3 children received a Copper-T 380A IUD 6 months ago. She tells you she has always had heavy menses, but now they seem to be even heavier. She states that the menses last a day longer and are associated with slightly more cramping. She has also been feeling weak and tired. She denies any risk of exposure to sexually transmitted diseases (STDs).

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
Copper IUDs increase average menstrual blood loss by about 50%, which may be significant for clients who are already anemic.[19]	Explain to the client that if the bleeding or pain is severe or if pelvic infection is present, the IUD should be removed. Tell her that you are going to perform a pelvic exam to rule out pelvic infection. If she wishes to keep her IUD and: 1. has no lower abdominal pain when her menses are absent, 2. is not at risk for STDs, 3. does not show clinically severe anemia (pallor, rapid heart rate), and 4. has a normal pelvic exam, then offer her iron tablets and recommend use of ibuprofen (or other non-steroidal anti-inflammatory medications, but not aspirin) during her menstrual period. If her heavy menses continue to be a problem and she really wants an IUD, tell her that she may be able to have her copper IUD replaced with a progestin-releasing IUD which would decrease the amount of menstrual bleeding. Inform her where progestin-releasing IUDs are available. If not available, help client make an informed choice of another method, such as combined oral contraceptives (COCs), Depo-Provera® (DMPA), or NORPLANT® Implants, all of which will improve anemia caused by heavy menses.	Bleeding generally decreases over time with IUD use (though pre-existing anemia may be worsened). Since anemia is due to blood loss, iron replacement therapy will improve anemia. Non-steroidal anti-inflammatory medications, such as ibuprofen, can decrease menstrual cramping and bleeding, and may be used for mild to moderate pain. Pelvic infection must first be ruled out. Progestin-releasing IUDs actually decrease the amount of blood loss to levels below a normal menstrual period. The higher the dose of progestin released by an IUD, the more effectively it decreases menstrual blood loss. This is because progestins suppress the build-up of the endometrium, which results in less menstrual bleeding.[20] Where these IUDs are not available, the use of COCs or DMPA is suggested for women with heavy menses because both decrease total menstrual blood loss and improve anemia.[21,22] Non-steroidal anti-inflammatory drugs should be used (e.g., 200 to 400 mg of ibuprofen 3 to 4 /day) instead of aspirin because of aspirin's stronger and longer-lasting inhibitory effects on platelet aggregation (it promotes bleeding).

CASE C-2: NORPLANT® Implants user complains of frequent spotting.

A 21 year-old client, who has never had children, returns to the hospital family planning (FP) clinic. She is complaining of frequent spotting since receiving her NORPLANT® Implants 3 months ago. She states she has been spotting or lightly bleeding almost all the time. She is worried and annoyed. She acknowledges one new sexual partner since receiving her NORPLANT® Implants. She denies lower abdominal pain or abnormal vaginal discharge.

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
It is normal for NORPLANT® Implants to cause irregular bleeding. This side effect can be due to two main related causes:[23] 1. It is chiefly due to disruption of ovulation. The predictable pattern of endometrial build-up and shedding is altered. 2. NORPLANT® Implants are a low dose progestin-only method. The body's own estrogen production continues, which can occasionally cause slight build-up of the endometrium. This build-up can lead to unpredictable shedding.	Explain to the client that you want to examine her to be sure no pelvic infection or other problems of her reproductive tract has caused the frequent abnormal bleeding (particularly since she is at risk of STDs). If there is no evidence of infection in the vagina, uterus or cervix, and no evidence of other problem or pregnancy, then reassure her that the irregular bleeding is just a normal side effect of the NORPLANT® Implants. Explain to the client that bleeding caused by the NORPLANT® Implants may be stopped by either: 1. taking ibuprofen 4 times a day for 5 days or 2. taking one pack of combined oral contraceptives (COCs) (one pill per day) until the pack is finished. Ask her which method she would like to use, and tell her that **neither** of these methods should be used as a long-term solution. Explain that even if she used ibuprofen or COCs now, she may have irregular and frequent spotting in the future with NORPLANT® Implants, but this is safe and normal. Explain that because she has a new sexual partner, she is at risk of exposure to STDs. Offer her some condoms.	The use of ibuprofen or other non-steroidal anti-inflammatory drugs controls uterine bleeding by blocking the production of prostaglandins (the chemicals which cause uterine contractions and are involved in uterine bleeding). COCs can also temporarily stop bleeding caused by NORPLANT® Implants. The estrogen and progestin present in the COCs work to build up and stabilize the endometrium for 3 weeks. The top (superficial) layers of the endometrium are then shed. No blood vessels are left exposed. However, use of COCs will not prevent future irregular bleeding with NORPLANT® Implants. NORPLANT® Implants may cause increased bleeding in some women and decreased bleeding in others. Irregularities of bleeding patterns tend to decrease over time.[24] Nonsteroidal anti-inflammatory drugs (e.g., ibuprofen) should be used instead of aspirin because of aspirin's stronger and longer-lasting inhibitory effects on platelet aggregation (aspirin promotes bleeding).

CASE C-3: New Depo-Provera® user complains of prolonged/heavy bleeding.
A client who received her first (and only) injection of Depo-Provera® 6 weeks ago returns complaining of heavy bleeding. She denies symptoms of pregnancy or pelvic infection (such as lower abdominal pain or abnormal vaginal discharge).

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
Depo-Provera® disturbs the pituitary gland's control of the menstrual cycle. In the first 3 months of Depo-Provera® use, these changes commonly result in irregular, frequent, prolonged, or heavy bleeding.	Since it has been more than 4 weeks since the client received her Depo-Provera® injection, offer her a second injection to stop her bleeding. Explain that you expect to control her bleeding quite well with this second injection, but that you want to make arrangements for follow-up.	With each successive Depo-Provera® injection, negative feedback from the anterior pituitary gland to the ovaries is more effective. The ovaries' production of estrogen becomes more suppressed. With less estrogen to stimulate the endometrium, there is less endometrium to be shed. Eventually amenorrhea is achieved. Half of Depo-Provera® users become amenorrheic by the end of the first year, and two-thirds by the second year. Early reinjection with Depo-Provera® may speed up the arrival of amenorrhea (absent menses).[25,26]

CASE C-4: Combined oral contraceptive (COC) user complains of bleeding/spotting.
A client using COCs complains of spotting. She denies missing any pills, taking any medicines recently, or having recent vomiting or diarrhea. She has been taking COCs for more than 3 months and has had slight spotting in the middle of the cycle almost every month.

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
Spotting may be due to inadequate progestin support of the endometrium. Progestins are necessary to sustain the endometrium. Spotting may also be due to pregnancy or other serious causes, such as subtle pelvic infection or cervicitis. Spotting may also be due to irregular pill taking which the client may be embarrassed to admit.	In the first three months of COC use, spotting is normal and (unless the history suggests other problems) no exam is necessary. After 3 months, take a history and perform a pelvic exam to rule out pregnancy, pelvic infections, and other serious causes. If you cannot find a serious cause for her spotting, ask if perhaps she is having difficulty remembering to take the pill at the same time every day. If she claims to be taking the pill correctly, explain to the client that you believe that the pill that she has been taking may not be quite right for her individual body and that a different pill may solve the spotting. If the spotting is not due to other causes, switch client to a pill with a more potent progestin (levonorgestrel and norgestrel are the most potent progestins commonly available in COCs). If she is already on a potent progestin pill, consider increasing the estrogen dose to 50 micrograms, if she has no conditions which would make her ineligible for higher estrogen dose.	It is very important to rule out pregnancy and other serious causes of spotting, such as pelvic infection or cervicitis. More potent progestins promote better maintenance of the endometrium.[27] Increasing the dose of estrogen may help stabilize the endometrium by causing the endometrium to become more sensitive to existing levels of progestins (however, there is no strong proof of this).

CASE C-5: Once-a-month combined injectable contraceptive (CIC) user complains of prolonged bleeding.
A 32-year-old mother of 3 children has been taking once-a-month combined injectables for 3 months. She returns for her fourth injection and reports that she has been having episodes of prolonged bleeding (bleeding/spotting lasting 10 days or more) over the last two months. She is concerned that this is not normal and wonders if she should stop the injections.

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
Irregular and prolonged spotting/bleeding episodes are common while taking once-a-month combined injectables, especially during the first 3 to 6 months of use.[28] These episodes decrease with increased duration of once-a-month injectable use.[28]	Reassure the client that irregular and prolonged bleeding are common in the first few months of once-a-month injectable use. These episodes are not harmful and should decrease as she receives more monthly injections. Despite reassurance, some women will find irregular or prolonged bleeding to be unacceptable; help these clients make an informed choice of another method.	Irregular and prolonged spotting/bleeding occur commonly with once-a-month combined injectables, particularly when women first begin using them. This is because the normal pattern of rising then falling estrogen and progesterone has been disrupted. The amount of hormones present in the once-a-month combined injectables will not be sufficiently high to sustain the endometrium in all women, and some women will experience irregular or prolonged spotting or bleeding.

CASE C-6: Emergency contraceptive (EC) user is concerned about early menstrual bleeding.
An 18-year-old woman comes to the clinic. She was given ECPs at another clinic 10 days ago, because the condom she and her partner were using had broken during intercourse. She is concerned because she is now bleeding, but her period is not due for another 4 or 5 days.

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
Treatment with emergency contraceptive pills (ECPs) consists of two doses of hormonal pills, with the first dose taken as soon as possible after unprotected intercourse. These pills can be either COCs or POPs. ECPs provide a short, strong burst of hormone exposure, which disrupts hormonal patterns that are essential for pregnancy. Hormone release from the ovary is altered, and development of the uterine lining is disturbed. These disruptions are only temporary, lasting only a few days. Menstrual irregularities or a mistimed period (either a few days early or a few days late) are common with ECP use. [29, 30]	Explain to the client that ECPs work by disrupting the normal pattern of hormones which control the menstrual cycle. Because of this disruption, a woman's period may come earlier or later than normal right after she has taken ECPs. Reassure the client that this early period is normal, and that her cycles should go back to their regular pattern after this period. Counsel the client concerning her desires for a routine contraceptive method, so she will not need to rely on ECPs.	Because ECPs work by disrupting the normal menstrual cycle and hormonal patterns, menstrual irregularities and/or mistimed periods are normal side effects of ECPs and are not harmful.

D. AMENORRHEA

CASE D-1: Combined oral contraceptive (COC) user with absent menses is concerned about pregnancy.
A non-pregnant client using COCs is troubled by absent menses (amenorrhea), despite reassurance. She wants to continue taking COCs. She denies missing any pills and denies symptoms of pregnancy. She has not been taking rifampine (a medicine used to treat tuberculosis) or anti-seizure medications. She states that she has had no severe diarrhea or vomiting in the last 2 months.

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
In the non-pregnant woman using low-dose COCs, the endometrial lining does not build up very much. This is because of the low dose of estrogen. At the end of the month, there is little or no lining to be shed.	After ruling out pregnancy, reassure the client that no lining is building up, so there is nothing to be shed. Reassure her that she is not at risk of pregnancy, and discuss with her how the amenorrhea affects her life. If, despite reassurance, she really wants to be reassured by monthly bleeding, she will need to take a pill with a higher estrogen dose or choose another contraceptive method.	To build up a thicker lining, the COC estrogen dose could be increased to 50 micrograms, but not more.[31] Amenorrhea (absent menses) due to low estrogen hormonal contraceptives occurs because the endometrium is thinned and is functioning less. This condition is safe and also protects against cancer of the endometrium and anemia.[32]

CASE D-2: NORPLANT® Implants user with absent menses is concerned for her fertility.

A 23-year-old mother of 1 child received her NORPLANT® Implants 3 years ago. She is concerned over the fact that she has not had a period for the last year. She wants to have a second child 2 years from now. She is worried that the absence of menses indicates her fertility has been damaged by the NORPLANT® Implants.

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
Amenorrhea (absence of menses) develops with NORPLANT® Implants. The low level of progestin results in little build-up of the endometrium. Because of the low progestin levels in NORPLANT® Implants, ovulation is not always blocked. However, if the client develops amenorrhea while using NORPLANT® Implants, this means that ovulation has been blocked and the client is completely protected against pregnancy. Studies of the risk of pregnancy with NORPLANT® Implants show no pregnancies for NORPLANT® Implants users who have long-term amenorrhea.	Explain to the client that having no menses is normal with NORPLANT® Implants because they keep the lining of her uterus from building up. There is no lining to be shed (as her menstrual period) at the end of the month. When she chooses to have her NORPLANT® Implants removed, her fertility level will return to what it was before she used NORPLANT® Implants. The pattern of menses she had before she chose NORPLANT® Implants will resume after she no longer wishes to use this reversible contraceptive method.	The return to fertility after discontinuation of NORPLANT® Implants is almost immediate; blood levels fall to near zero within 24 hours.[7] Women who had irregular menses before using a hormonal contraceptive will return to their pattern of irregular menses when the hormonal contraceptive is stopped.

CASE D-3: Depo-Provera® user with absent menses is concerned about her fertility.

A 21 year-old student who has had no children selected Depo-Provera® (DMPA) because of its effectiveness. After her fourth injection, she developed amenorrhea (absent menses). She is now worried that something poisonous is building up inside her. She says she plans to graduate, marry and start a family in one year, and wonders what absent menses on DMPA means about her future fertility.

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
DMPA provides a high dose of progestin, which causes strong "negative feedback" to the pituitary gland. This blocks ovulation for an average of 4 to 5 months after each injection. [25] In fact, some amount of DMPA remains in the bloodstream until 7 to 9 months after the last injection. Amenorrhea occurs because there is no endometrial build-up when progestin levels are high.	Explain to the client that Depo-Provera® normally causes absent menses, especially by the fourth injection. This is not because menstrual blood or something poisonous is building up inside her. Menstrual flow is due to build-up of the uterine lining. At the end of the month, when hormone levels fall, this lining is shed. With Depo-Provera®, no lining builds up, so there is no lining to be shed. Explain that after she decides to stop the injections, she will have her menses after a delay. It may take 10 months or so from her last injection for her menses to return. Reassure her that DMPA has no long term effect on fertility.	DMPA always causes a slight delay in the return of the fertility level. After discontinuing DMPA, about 50% of women conceive by 10 months after the last injection. This time delay to conception is approximately 4 months longer than the time it takes for women who discontinue COCs, IUDs or barrier methods to conceive. Residual amounts of DMPA will remain in circulation for about 7 to 9 months after an injection. By about 2 to 3 years after discontinuation of DMPA, the proportion of women who have conceived is virtually the same as for those who have discontinued use of IUDs, diaphragms and COCs. The delay in return to fertility with NET-EN is presumed to be no more than with DMPA. The delay in return to fertility is the same after the first Depo-Provera® injection as after later injections.

E. FORGOTTEN PILLS OR FORGOTTEN RE-INJECTION DATE

CASE E-1: Combined oral contraceptive (COC) user forgets 2 pills.

A client has forgotten 2 (or more) COCs, and wonders what to do. She knows that if she misses only one pill, she should take the forgotten pill as soon as she remembers and take today's pill at the usual time.

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
COC packets contain 21 "active" (white) pills, with or without 7 "placebo" or "reminder" brown pills. To maintain the hormonal level in the body, the COCs must be taken daily. After missing 2 or more "active" pills, hormonal levels fall, and development of the ovarian follicle may proceed. This means there is a risk that the client may go on to ovulate.	Explain to the client that if she forgets to take 2 white pills, she should take the next pill as soon as she remembers and then take one pill daily until she has finished the pack.[33] She should also use a back-up method (or abstain) until she has taken one active (white) pill per day, **7 days in a row.**[33] Tell her that if she forgets to take one or more pills during the fourth week (brown pills), do not worry. Simply throw away the missed brown pills and continue to take a brown pill each day until the end of the pack.	It takes 7 days of active COC pills to reliably suppress follicular development and prevent ovulation.[1,2] The last 7 days of a pill packet contain iron or placebo pills which do not have any contraceptive effect. Therefore, forgotten pills in the placebo week do not need to be "made up." The risk of ovulation is particularly high if 2 or more "active pills" are forgotten at the beginning or the end of the 21 days of active pills. For example, forgetting pills #1 and #2, or #20 and #21 will mean that the client takes no active pills for 9 days in a row. The risk of ovulation increases with a longer "pill-free" (placebo) interval: "pill-free" interval of 10 days carries a 10% risk of ovulation.

CASE E-2: Progestin-only pill (POP) user forgets 2 pills.

A 24-year-old woman comes to the clinic because she has forgotten to take her last two progestin-only pills (POPs). Her husband has been away, but he is coming back tonight, and the woman wants to know what she should do.

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
To maintain their contraceptive effect, POPs must be taken daily, at the same time every day. When a POP is missed, the hormone levels drop. Therefore, the effect on the cervical mucus is lost and sperm may be able to penetrate the mucus. [18] When two or more pills are missed, there is an increased chance of breakthrough ovulation. [18] **Note**: If a woman is breastfeeding and her menses have not returned, she may not yet be at risk of pregnancy, and one or two missed pills may not be of great concern. Breastfeeding may act as the back-up method.	Explain to the client that if she forgets to take two (or more) pills, she should take the next pill as soon as she remembers and then resume taking one pill every day, at the same time each day. She should also use a back-up method until the POPs regain their effect (at least 2 days). Some programs may recommend up to 7 days of a back-up method.	POPs take effect on the cervical mucus in 3 to 5 hours. [18] At least 2 days of a back-up method is necessary when re-initiating POPs, after having missed 1 or more pills.

CASE E-3: Client returns 4 weeks late for Depo-Provera® re-injection.

A client has been using DMPA for six months and returns to the clinic for her next injection. However, she was not able to come to the clinic for her original appointment for re-injection and it has now been 17 weeks since her last injection (i.e., she is now 4 weeks late and is at the outer limits of the grace period for re-injection).

UNDERLYING PHYSIOLOGY OF CASE PRESENTATION	SUGGESTED SERVICE PROVIDER RESPONSE	RATIONALE FOR THE RESPONSE
DMPA blood levels remain high enough to maintain contraceptive efficacy through 3 months (13 weeks) post-injection and the pregnancy risk at 4 months (17 weeks) post-injection is still extremely low. [34] Therefore, the grace period for re-injection is generally considered to be 2 weeks (i.e., up to 15 weeks post-injection), but may be up to 4 weeks (17 weeks post-injection) for some women, depending on their body weight, metabolism, and menstrual status. [35]	Counsel the woman that her risk of pregnancy is still very low, especially if she has not had unprotected sex and is amenorrheic. However, she should know that there may be a small chance that she is pregnant, and while there is no evidence that progestin-only injectables cause birth defects, an injection should not be used if a woman is already pregnant. The woman can then choose whether to have another injection or to use a back-up method until her next menses.	DMPA has been shown to be most effective in the first 13 weeks post-injection. The contraceptive effect slowly diminishes after 13 weeks as the amount of DMPA in a woman's body decreases, but is still highly effective for 2 to 4 more weeks. [34] DMPA is not known to cause birth defects.[36] Women who have become amenorrheic on DMPA are probably at lower risk of pregnancy from a late injection than women having some bleeding due to more complete endometrial atrophy.

STUDY QUESTIONS

Instructions: The following questions can be used for trainers' self-study or for review sessions with trainees.

- Answer all of the questions on a separate sheet of paper.
- Study the answers to the questions you did not know. The answers can be found on the page following the last question.
- For trainee reviews, use the questions as objective test items or in a "grab bag" session with questions written on index cards.

1. Explain why a back-up method must be used if COCs are begun after day 5 of the menstrual cycle.

2. When is the best time to insert NORPLANT® Implants? How long should a back-up method be used after insertion?

3. When is the best period during the menstrual cycle to perform tubal ligation? Why?

4. What three conditions must a postpartum client meet in order to reliably use the Lactational Amenorrhea Method (LAM)?

5. How would you respond to a client who requests an IUD at 6 months postpartum? Explain your answer.

6. How would you respond to a client who wishes to switch from using an IUD to COCs? Explain your answer.

7. How would you respond to a Depo-Provera® user who wishes to switch to another contraceptive method? Explain your answer.

8. What are the key messages to cover when counseling a client about COCs?

9. Why must a POP user be very strict about her schedule for taking her pills?

10. Describe how menstrual flow (i.e., amount, regularity) may be influenced by use of:
    a. the IUD (both copper- and progestin-releasing types)
    b. COCs
    c. Depo-Provera®
    d. NORPLANT® Implants

STUDY QUESTIONS (continued)

11. What points should you cover in counseling a client who has forgotten two white COC pills?

12. What points should you cover in counseling a client who has forgotten two POP pills?

ANSWERS TO STUDY QUESTIONS

1. The ovarian follicle starts to develop after day 5 of the menstrual cycle. Ovulation generally takes place anywhere between day 12 and day 16 of the cycle. It takes 7 days for COCs to become effective. Therefore, COCs should be started by day 5 in order to effectively block ovulation.

2. NORPLANT® Implants are best inserted through day 6 of the menstrual cycle. Their contraceptive effect occurs within 24 hours. If NORPLANT® Implants are inserted after day 6, a back-up method should be used for 24 hours.

3. Tubal ligation should be performed before day 10 of the menstrual cycle because fertile ovulation very rarely occurs before the 10th day of the cycle. Tubal ligation provides immediate protection against pregnancy. If tubal ligation is performed during the middle of the cycle (day 10 to day 20), the ovaries may have already released an egg into the uterus. Another method, such as a condom or spermicides, should be used until the next menses.

4. The three conditions required for a client to effectively use LAM. She is:
   1. in the first 6 months postpartum;
   2. fully or nearly fully breastfeeding; and
   3. amenorrheic (without menstrual periods).

   After 6 months postpartum, the effectiveness of LAM decreases.

5. If the client has been fully or nearly fully breastfeeding or has been consistently using condoms since resuming sexual relations, an IUD can be safely inserted (or another contraceptive method can be initiated). Through history and pelvic exam, rule out pregnancy and other conditions that would make her ineligible to receive her IUD. It is very important to ensure that a client is not pregnant if she has not been fully or nearly fully breastfeeding, because about half of all pregnancies with an IUD in place end in septic abortion. If the client is breastfeeding, encourage her to continue.

6. If the IUD-user has had regular menses, you can assume that she is not pregnant. It is therefore safe to initiate a new method. Determine at what day she is in her menstrual cycle (i.e., ask when her last menstrual period (LMP) was). It is important to start COCs in the first 5 days of the menstrual cycle so that ovulation will be blocked. If COCs are started after day 5, a back-up method must be used for 7 days.

7. If the Depo-Provera® user has been receiving injections every 3 months (even if she is 2 weeks late for her re-injection), it is safe to assume she is not pregnant. The client can switch to any contraceptive method, for which she has no conditions that would make her ineligible. Depending on the method selected, it will be important to determine at what day the client is in her cycle in case it is necessary to recommend that the client use a back-up until her selected method is effective.

ANSWERS TO STUDY QUESTIONS (continued)

8. COCs are very effective when taken correctly. Daily pill taking is important to maintain the hormone level in her body and to ensure effectiveness.

   If the client ever forgets a COC pill, advise her to start taking them again as soon as she remembers and to use a back-up method for at least 2 days.

   If a client misses 2 COCs, she needs to take the next pill as soon as she remembers and then take 1 pill daily until she completes the pack. She must use back-up contraception until she has taken one active (white) pill per day for 7 days.

9. Although POPs are very effective, a client using POPs must be strict about taking the pills at the same time daily to maintain progestin levels in her body (bloodstream). Because POPs have about one-third the dose of progestin in COCs, even missing one pill or taking pills at irregular times decrease their effectiveness. The cervical mucus may not become thick enough to block sperm from reaching the uterus and/or a follicle may develop which could lead to ovulation. Breastfeeding women need not be so concerned about what time of day they take POPs, because POPs are highly effective in breastfeeding women, due to the partial decrease in fertility from breastfeeding.

10. a. Copper-releasing IUDs increase average menstrual blood loss by about 50%. However, bleeding generally decreases over time with IUD use.

       Progestin-releasing IUDs markedly decrease the amount of blood loss during a menstrual period because the progestin suppresses the build-up of the endometrium.

       For both copper and progestin-releasing IUDs, spotting between periods may occur, especially in the first few months.

    b. The use of COCs may result in spotting for some clients because the pill contains a low dosage of progestin. (Progestin supports the endometrium). If the spotting is severe for these clients, they may need to switch to a different pill.

       COC users may occasionally have absent menses because of the low dose of both estrogen and progestin. (COCs also suppress ovarian estrogen production.) Due to low estrogen levels, the endometrium does not become rich and thick. At the end of the month, there is little or no lining to be shed.

       COCs are recommended for women with heavy menses because they tend to decrease total menstrual blood loss and improve anemia.

    c. During the first 3 months of Depo-Provera® use, heavy or irregular bleeding may occur. However, with each Depo-Provera® injection, the ovaries' production of estrogen becomes more suppressed. Absent menses (amenorrhea) is usually achieved after the fourth injection. Half of Depo-Provera® users become amenorrheic by the end of the first year and two-thirds by the second year. (Depo-Provera® is also recommended for women with heavy menses.)

ANSWERS TO STUDY QUESTIONS (continued)

c. Absent menses occurs because there is not endometrial build-up when estrogen levels are low. Little estrogen is made by the ovaries because the high progestin levels in Depo-Provera® suppress the anterior pituitary gland's stimulation of the ovaries.

d. It is normal for NORPLANT® Implants to cause irregular, unpredictable bleeding because ovulation is disrupted.

   NORPLANT® Implants users may develop absent menses for several months in a row. The continuous release of progestin from the NORPLANT® capsules results in suppression of the anterior pituitary gland's hormonal secretions; thus, alterations of normal ovarian function occur. When the ovaries produce little estrogen, there is not much build-up of the endometrium.

11. A client should be told to take the next pill as soon as she remembers, and then take one pill daily until she finishes the packet. She should also use a back-up method (or abstain) until she has taken one active (white) pill per day, for 7 days in a row.

12. Even though POPs take effect on the cervical mucus in 3 to 5 hours, at least 2 days of a back-up method is necessary when re-initiating POPs, after having missed 1 or more pills. Some clinicians recommend up to 7 days of back-up use.

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