
Contraception

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MBChB lecture

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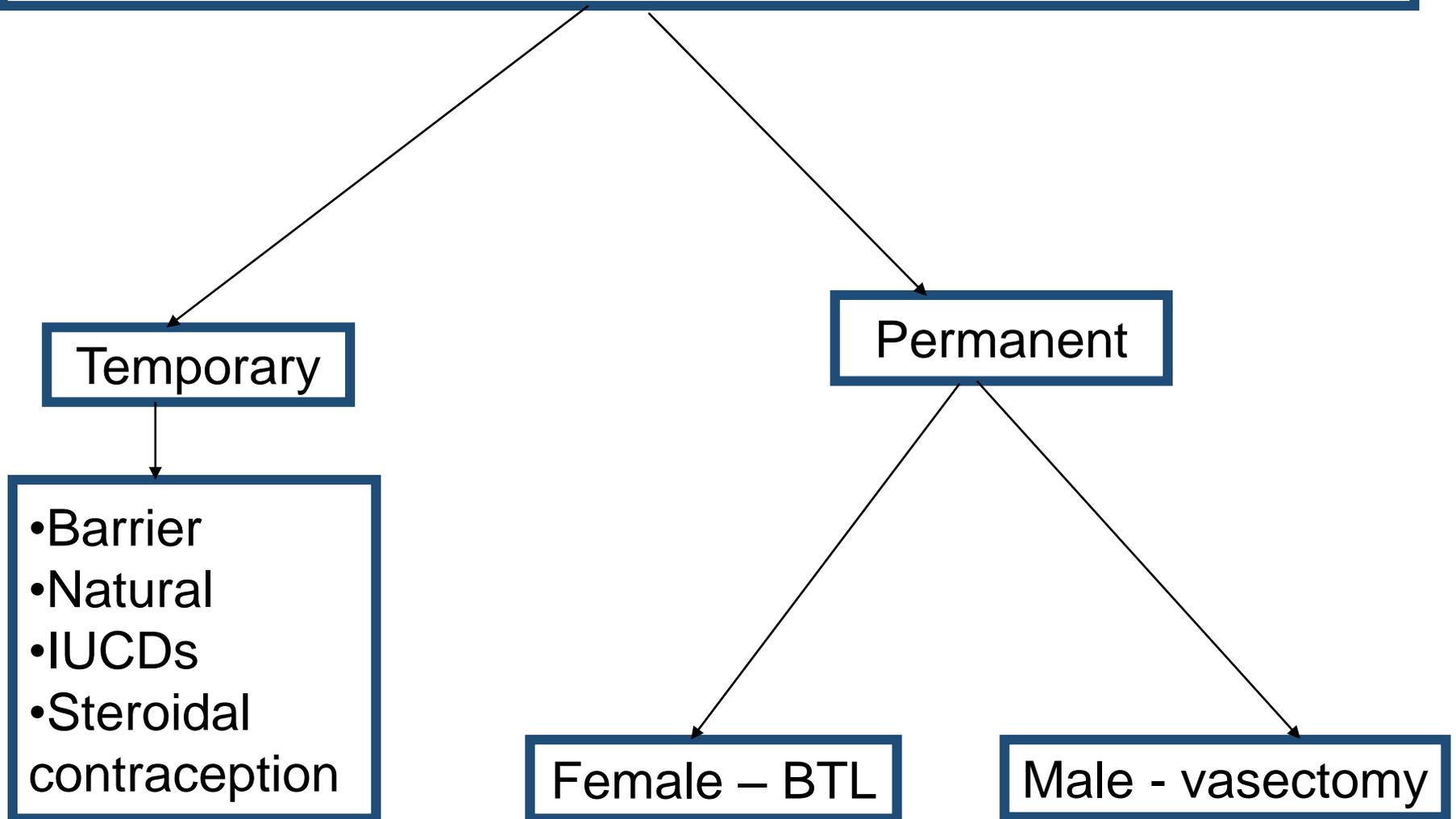
Definition

- The term contraception includes all measures, temporary or permanent, designed to prevent pregnancy due to the coital act

An ideal contraceptive

- This should fulfil the following criteria:
 - Widely acceptable,
 - Inexpensive,
 - Simple to use, safe, highly effective and
 - Requiring minimal motivation, maintenance and supervision.
 - No one single universally acceptable method has yet been discovered.
-

Methods of contraception



An approach

- Faced with a number of options, it can be difficult to choose the most suitable contraceptive
- A useful approach to consider is the following:
 - Is she wishing to conceive?
 - How devastating would it be for the woman to conceive, or is the aim to space out the pregnancies?

An approach

- How reversible does the method need to be? Is she not likely to want to get pregnant ever again, or in the next 5 years, or in a few months?
- Which methods seems acceptable to her?
- Are there any absolute or relative contraindications to the method?
- Always discuss the risk of STIs and using condoms to protect against them

History (all types of contraception)

- Age
- Current contraception
- Past contraception including likes, dislikes, myths
- Pregnancy – numbers, pregnancy induced problems, types of delivery, whether currently lactating

History (all types of contraception)

- Past major illness – specifically HTN, CVA, SCD, thromboembolic disease (TED)
- Allergies
- Regular medication
- Menstrual history
- Previous gynaecological history and any other symptoms e.g post coital bleeding

History (all types of contraception)

- STIs and sexual history, including last unprotected sexual intercourse
- Smoking
- Cervical smear history
- Family history

Methods available

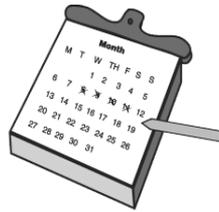
- Natural methods – associated with higher failure rate
 - They rely on the fact that there are only certain days during the menstrual cycle when conception can occur
 - After ovulation, the egg (ovum) is viable for a maximum of 24 hours while
 - The sperm is viable for 3 to 7 days
 - Some of these methods require long periods of sexual abstinence

Methods available

□ Natural FP methods include:

- Coitus interruptus – withdrawing penis from vagina before ejaculation

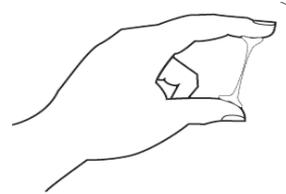
- Rhythm or cycle



- Temperature



- Cervical mucus (Billings)

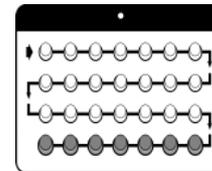


- LAM - for women fully breastfeeding and not having menses the first 6 months after childbirth



Methods available

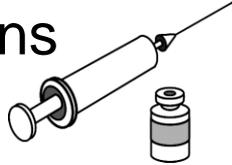
- Barrier methods – provide physical barrier to the sperm
 - Diaphragm; Occlusive caps (e.g. cervical cap); Condoms
- Spermicides – chemicals that cause sperm death.
 - They are usually used in conjunction with barrier methods and include creams, films, foams, jellies, pessaries, sponges
- Hormonal methods
 - Combined oral contraceptives (COCs)



Methods available

- Depot progestogens

- Injections



- Implants e.g. Jadelle

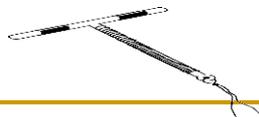


- Subcutaneous silicon

- Vaginal – silicon rings releasing oestrogen and progestogen

- Intrauterine contraceptive devices (IUCDs)

- Copper bearing



Methods available

- Progestogen releasing (Mirena)
- Permanent (surgical) methods
 - Tubal ligation
 - Vasectomy

Comparing Effectiveness

More effective

Less than 1 pregnancy per 100 women in one year



Implants



IUD



Female Sterilization



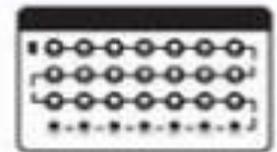
Vasectomy



Injectables



LAM



Pills

Male or Female Condoms



Diaphragm



Fertility Awareness Methods

Less effective

About 30 pregnancies per 100 women in one year



Withdrawal



Spermicides

Factors affecting choice of method

Whether or not a method is:

- Permanent or reversible
 - Effective – this depends on how the method works and how easy it is to use
 - Inexpensive
 - Perceived to be safe
 - Easy to obtain
-

Factors affecting choice of method

- Easy to use and discontinue
 - Has frequent undesirable or side effects
 - Can be used while breast feeding
 - Protects against STIs
 - Requires partner cooperation
 - Must be used each time the couple have sex
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Failure rate in contraception

- There are four factors that affect failure rate of contraception:
 1. The inherent weakness of the method
 - e.g. the rhythm method depends on accurate determination of time of ovulation and can never be as reliable as a COC
 2. Age:
 - Failure rate declines as age increases and fertility and frequency of intercourse also decrease

Failure rate in contraception

3. Motivation:

- Every method depends on determination to use it correctly

4. Duration of use – failure rate decreases as duration of use and therefore habit, increase

Combined oral contraceptives (COCs)

- The most effective reversible method of contraception and commonest form
- Consists of oestrogen (E) and progestin (P)
- The commonly used progestins in the COCs are either levonorgestrel or norethisterone or desogestrel
- The estrogens are principally confined to either ethinyl-estradiol or mestranol

Mechanism of action (1)

■ Inhibition of ovulation:

- The release of gonadotropin releasing hormones from the hypothalamus is prevented through a negative feedback mechanism.
- There is thus no peak release of FSH and LH from the anterior pituitary.
- So follicular growth is either not initiated or if initiated, recruitment does not occur.

Mechanism of action (2)

- **Producing static endometrial hypoplasia**

- There is stromal edema, decidual reaction and regression of the glands making endometrium nonreceptive to the embryo.

- **Alteration of the character of the cervical mucus (thick, viscid and scanty) so as to prevent sperm penetration.**

- They thicken the cervical mucus, preventing sperm penetration
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Mechanism of action (3)

- **Probably interferes** with tubal motility and alters tubal transport.
 - Thus, even though accidental breakthrough ovulation occurs, the other mechanisms prevent conception

Efficacy of COC

- Pregnancy rates are 0.1% when fully compliant
- Typical usage is associated with a 5.0% failure rate during the first year of use

Contraindications and risks

- There are four categories in terms of eligibility:
 - Unrestricted use
 - Benefits generally outweigh the risk
 - Risks generally outweigh the benefit (relative contraindication)
 - Unacceptable health risk and should not be used (absolute contraindication)

Absolute contraindications to COC use

- Thrombophlebitis, thromboembolic disorders, CVA, coronary occlusion
- Markedly impaired liver function
- known or suspected breast cancer
- Undiagnosed abnormal vaginal bleeding
- Known or suspected pregnancy
- Smokers over the age of 35 years

Relative contraindications to COC use

- Migraine headaches
- Hypertension
- H/O gestational diabetes
- Elective surgery
- Epilepsy
- H/O obstructive jaundice in pregnancy
- Sickle cell disease
- Diabetes mellitus
- Gall bladder disease

Clinical problems associated with COCs

- Breakthrough bleeding
- Amenorrhoea
- weight gain
- Acne
- Ovarian cysts
- Migraine headaches
- Drugs that affect efficacy

Patient selection (1)

- **History & general examination** should be thorough
 - Examination of the breasts for any nodules, weight and blood pressure are to be noted.
- **Pelvic examination** to exclude cervical pathology, is mandatory. Pregnancy must be excluded.
- **Cervical cytology** to exclude abnormal cells, is to be done.

Patient selection (2)

- Any woman of reproductive age group without any systemic disease and contraindications listed, is a suitable candidate for combined pill therapy.
- Growth and development of the pubertal and sexually active girls are not affected by the use of “pill”.

Non-contraceptive benefits of oral contraceptives (Ocs)

- These can broadly be grouped into two main categories:
 - Benefits that incidentally accrue when OC are specifically utilized for contraception &
 - Benefits that result from the use of OCs to treat problems or disorders

Non contraceptive benefits of OCs

- Regulation of menstrual cycle
- Less endometrial cancer
- Less ovarian cancer
- Fewer ectopic pregnancies.
- More regular menses
- Less PID
- Less rheumatoid arthritis
- Increased bone density
- Less endometriosis
- Less benign breast disease
- Fewer ovarian cysts

OC as treatment

- Heavy menstrual bleeding (HMB)
- Dysmenorrhoea
- Endometriosis prophylaxis
- Acne & hirsutism
- Hormone therapy for hypothalamic amenorrhoea
- Functional ovarian cysts
- Reduction of premenstrual syndrome

How to prescribe the Pill (1)

- New users should normally start their pill packet on day one of their cycle.
- One tablet is to be taken daily preferably at bed time for consecutive 21 days.
- It is continued for 21 days and then have a 7 days break, with this routine there is contraceptive protection from the first pill.

How to prescribe the Pill (2)

- 7 of the pills are dummies and contain either iron or vitamin preparations.
- However, a woman can start the pill up to day 5 of the bleeding.
- In that case she is advised to use a condom for the next 7 days.
- The pill should be started on the day after abortion.

How to prescribe the Pill (3)

- Following childbirth in non-lactating woman, it is started after 3 weeks and in lactating woman it is to be withheld for 6 months

Missed pills (1)

- It is easy to forget a pill or be late in taking it
- COC users need to know what to do if they forget to take pills
- When a woman forgets to take **one pill**, she should take the missed pill at once and continue the rest as schedule. Nothing to worry.

Missed pills (2)

- When she **misses 2 pills** in the first week (days 1–7), she should take 2 pills on each of the next 2 days and then continue the rest as schedule.
- Extra precaution has to be taken for next 7 days either by using a condom or by avoiding sex
- If 2 pills are missed in the 3rd wk (days 15–21) or if > 2 active pills are missed at any time, another form of contraception should be used as back up for next 7 days as mentioned above.

Missed pills (3)

- She should start the next pack without a break.
- If she misses any of the **7 inactive pills** (in a 28-day pack only) she should throw away the missed pills; take the remaining pills one a day and start the new pack as usual.

The Progestin-only Pill (POP) - minipill

- POP is devoid of any estrogen compound.
- It contains very low dose of a progestin
- It has to be taken daily from the first day of the cycle

Mechanism of action

- It works mainly by making cervical mucus thick and viscous, thereby preventing sperm penetration.
- It also has the effect of thinning the endometrium, inhibiting implantation
- Ovulation is affected in 60% of women on POP – 1/3 do not ovulate but 2/3 experience variable interference

Efficacy

- Efficacy increases with age as fertility declines
- It is more likely to fail in women > 70kg.
- During breastfeeding, efficacy approaches 100%

How to prescribe the minipill

- The first pill has to be taken on the 1st day of the cycle & then continuously.
 - It has to be taken regularly & at the same time of the day.
 - There must be no break between the packs.
 - Delay in intake for >3 hrs, the woman should have missed pill immediately & the next one as schedule.
 - Extra precaution with condoms should be in place for next 2 days
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Advantages of the POP (1)

- Side effects attributed to estrogen in the COCP are totally eliminated
 - No adverse effect on lactation and hence can be suitably prescribed in lactating women
 - Easy to take as there is no “On and Off” regime
 - It may be prescribed in patient having (medical disorders) hypertension, fibroid, diabetes, epilepsy, smoking & history of thromboembolism
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Advantages of the POP (2)

- Reduces the risk of PID and endometrial cancer

Disadvantages of POP (1)

- Irregular bleeding – commonest
 - Increased risk of ectopic pregnancy
 - Worsening acne
 - Breast tenderness
 - Weight gain
 - Headaches
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Disadvantages of POP (2)

- Increased risk of benign functional ovarian cysts and pelvic pain (as interference with ovulation in 60%)

Contraindications

- Pregnancy
- Unexplained vaginal bleeding
- Recent breast cancer
- Arterial disease
- Thromboembolic disease.

Injectable progestin

- The preparations commonly used are:
 - Depomedroxy progesterone acetate (DMPA) and
 - Norethisterone enanthate (NET-EN).
- Both are administered intramuscularly (deltoid or gluteus muscle) within 5 days of the cycle.
- The injection should be deep, and the site not to be massaged.

Injectable contraception: Depo-provera

- Comes as microcrystals, suspended in an aqueous solution
- Correct dose is 150 mg IM (gluteal or deltoid) every 3 months
- Relies on higher peaks of progestin to inhibit ovulation and thicken cervical mucus.
- The progestin level is high enough to block the LH surge

Injectable contraception: Depo-provera

- The injection should be given within the first 5 days of the current menstrual cycle, otherwise a back-up method is necessary for 2 weeks
- The injection must be given deeply in muscle and not massaged

Injectable contraception: Depo-provera

- Easy to use, no daily or coital acton required
- Safe no serious health effects
- Effective as sterilization, IUCD & implant contraception
- Free from eostrogen related problems
- Private use not detectable
- Enhances lactation
- Has noncontraceptive benefits

Injectable contraception: Depo-provera

- Irregular menstrual bleeding
- Breast tenderness
- Weight gain
- Depression
- Can't be removed
- Return to fertility is delayed
- Regular injections required
- No STI/HIV protection

Depo-provera – absolute contraindications

- Pregnancy
- Unexplained genital bleeding

Barrier methods:

- There are 4 barrier methods and these are:
 - Male & female condoms, the diaphragm and the cap
- They work by preventing sperm deposition in the vagina or sperm penetration in the cervical canal
- The objective is achieved by mechanical devices or by chemical means which produce sperm immobilization, or by combined means

Efficacy

- Male condoms, if used according to instructions are 98% effective
- Condom failure rate is often much higher owing to user failure
- For female condoms, failure rate is 5%
- For the diaphragm, failure rate is 4-8/100 in 1 year (92-96% effective)

Condoms (1)

- Made of polyurethane or latex.
- Polyurethane condoms are thinner and suitable to those who are sensitive to latex rubber.
- The most widely practiced method used by the male.
- Protection against STIs is an additional advantage.
- Occasionally, the partner may be allergic to latex.

Condoms (2)

- suitable for couples wanting to space their families & have contraindications to oral contraceptives or IUCD
- Note: They must be used correctly every time to be highly effective

Advantages of condoms (1)

- Only need to use during sex
- Easily available and cheaper
- No medical side effects unless allergy to latex
- Easy to carry, simple to use and disposable
- Protect against most STIs and pre-malignant cervical changes

Disadvantages of condoms (2)

- May accidentally break or come off inside the vagina
 - May decrease sensation, making sex less enjoyable for both or either partner
 - Allergic reaction (Latex)
 - Both partners need to be motivated – psychological barrier
 - Female condoms can be noisy
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Disadvantages of condoms (3)

- Poor reputation.
 - Many people associate condoms with immoral sex, adultery or sex with prostitutes
- May embarrass some people to buy, ask partner to use, put on, take off, or throw away the condoms

Precautions with condoms

1. To use a fresh condom for every act of coitus.
2. To cover the penis with condom prior to genital contact.
3. Create a reservoir at the tip.
4. To withdraw while the penis is still erect.
5. To grasp the base of the condom during withdrawal

Diaphragm

- An intravaginal device made of latex with flexible metal or spring ring at the margin
- It should completely cover the cervix
- Ill fitting and accidental displacement during intercourse increase the failure rate

Advantages of diaphragm

- Cheap
- Can be used repeatedly for a long time
- Reduces PID / STIs to some extent
- Protects against cervical pre-cancer and cancer

Disadvantages of diaphragm (1)

- Less effective
- Forward planning
- Messy
- Requires help of a doctor or paramedical person to measure the size required
- Requires fitting – about 3 hrs before intercourse

Disadvantages of diaphragm (2)

- Risk of vaginal irritation and urinary tract infection
- Discomfort – occasionally vaginal abrasions
- Increased risk of candidiasis
- Not suitable for women with uterine prolapse

Spermicides (1)

- Available as vaginal foams, gels, creams, tablets and suppositories
- These agents mostly cause sperm immobilization
- The cream or jelly is introduced high in the vagina with the help of the applicator soon before coitus.
- Foam tablets (1–2) are to be introduced high in the vagina at least 5 minutes prior to intercourse.

Spermicides (2)

- In isolation, not effective, but enhances the efficacy of condom or diaphragm when used along with it.
- There may be occasional local allergic manifestations either in the vagina or vulva

Fig 1 - Spermicide



Intrauterine contraception

- Types of IUDS
 - Copper IUDs - TCU-380A, TCU-220C, Nova T, Multiload-375
 - Hormone-releasing IUDs

Implant contraception - Norplant

- Progestin circulating at levels $1/4$ to $1/10^{\text{th}}$ of those in COC, prevents conception by suppressing ovulation and thickening cervical mucus to inhibit sperm penetration
- Side effects include changes in menstrual pattern, weight gain, headache, and effects on mood

The mechanism of action

- Suppression at both the hypothalamic and pituitary LH surge necessary for ovulation
- The constant level of progestin has a marked effect on the cervical mucus
- Suppression of the estradiol-induced cyclic maturation of the endometrium and eventually causes atrophy

Disadvantages of Norplant

- Disruption of bleeding patterns in up to 80% of users
- Implants must be inserted and removed in a surgical procedure by trained personnel
- Implants can be visible under the naked eye
- Does not protect against STI/HIV
- Acne
- 30% of pregnancies are ectopic

Absolute contraindications

- Active thrombophlebitis or thromboembolic phenomena
- Undiagnosed genital bleeding
- Acute liver disease
- Benign or malignant liver tumours
- Known or suspected breast cancer

Implanon

- A single implant 4 cm long contains 60 mg of 3-keto desogestrel
- The hormone is released at a rate of about 60 micrograms per day
- Is designed to be provide contraception for 2-3 years
- Efficacy and side effects are similar to those or norplant

Jadelle

- Two rods containing 75mg LNG effective for 5 years
- Rods are easier and more convenient to insert and remove
- Norplant and Jadelle are bioequivalent over 5 years of use

Periodic abstinence

- Is keyed to the observation of naturally occurring signs and symptoms of the fertile phase of the menstrual cycle.
- It takes into account the viability of sperm in the female reproductive tract and the life span of the ovum

Methods of periodic abstinence

- Rhythm of Calendar method
- Cervical Mucus method
- Symptothermal method

Periodic abstinence

- Periodic abstinence is associated with good efficacy when used correctly and consistently and the following rules are observed:
 - No intercourse during mucus days
 - No intercourse within 3days after peak fecundity
 - No intercourse during times of stress

Withdrawal

- Involves removal of the penis from the vagina before ejaculation takes place
- 1st year failure rate - 18%
- Some sperm may be released before ejaculation
- Is a better method than using no method at all

Lactational Amenorrhoea Method (LAM)

- High concentrations of prolactin work at both central and ovarian sites to produce lactational amenorrhoea and anovulation
- Elevated levels of prolactin inhibit the pulsatile secretion of GnRH
- Only amenorrhoeic women who exclusively breastfeed at regular intervals, including at nighttime, during the first 6 months have the contraceptive protection equivalent to the provided by oral contraception

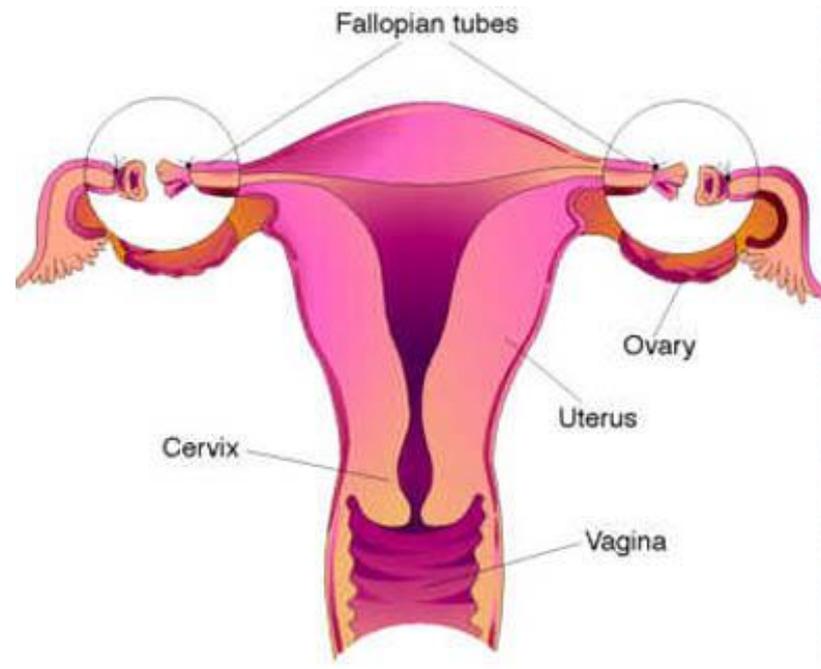
LAM

- With menstruation or after 6 months, the risk of ovulation increases
- Supplemental feeding increases the risk of ovulation (and pregnancy) even in amenorrheic women
- Total protection against pregnancy is achieved by exclusively b/feeding for 10 weeks

Permanent contraception

Female sterilization – tubal ligation

- This is a permanent method where a woman's fallopian tubes are ligated, excised, or coagulated



Advantages of female sterilization

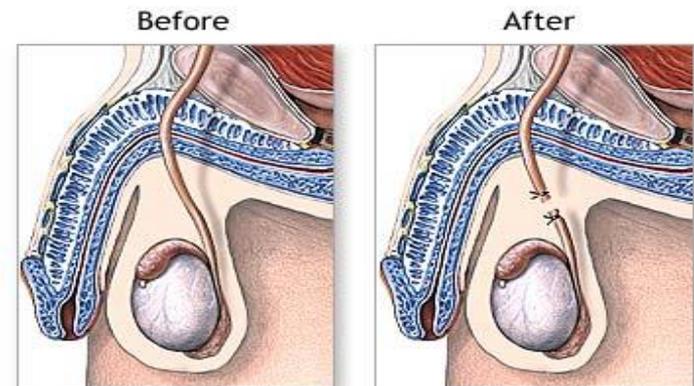
- Very effective- failure rate 1:1,000
- Permanent method
- Nothing to remember
- No interference with sex
- Increased enjoyment –no worries
- No effect on milk production in breast feeding women
- No health risks
- Can be done soon after delivery

Disadvantages of female sterilization

- Painful on operation site for few days
- Uncommon complications of surgery;
 - Infection /superficial or internal, and bleeding
 - Anaesthetic risks
 - Ectopic pregnancy
 - Requires trained staff
 - No protection against STIs and HIV

Male sterilization - vasectomy

- This is a permanent method where males vas deferens are cut and ligated
- Easy to perform, less expensive
- Able to test for effectiveness at any time



Advantages of vasectomy

- Very effective- failure rate 1/700
- Permanent
- Nothing to remember after 20 ejaculations or three months
- No interference with sex (man still has normal erections and ejaculates)
- Increased enjoyment
- No apparent long term health risks

Disadvantages of vasectomy

- Complications of surgery
 - Discomfort for 2-3 days
 - Pain in the scrotum
 - Brief feeling of faintness
 - Bleeding
 - Blood clots in the scrotum
- Requires some one trained
- Not immediately effective- unless after 20 ejaculations or after 3 months
- No STI/ HIV protection

Counselling for sterilization

- Consider reason for request
- Permanent
- Irreversible
- Explain procedure
- Failure rate

End!

