# REPRODUCTIVE HEALTH

- The term simply refers to healthy reproductive organs with normal functions.
- According to the **World Health Organisation (WHO)**, reproductive health means a total well-being in all aspects of reproduction, i.e., physical, emotional, behavioural and social.

## REPRODUCTIVE HEALTH – PROBLEMS AND STRATEGIES

- **India** was amongst the **first countries** in the world to initiate action plans and programmes at a national level.
- These programmes called **'family planning'** were initiated in **1951**.
- **RCH - Reproductive and Child Health Care Programmes**
  - Improved programmes covering wider reproduction-related areas are currently in operation under the popular name 'Reproductive and Child Health Care (RCH) programmes'.
- **Major tasks under RCH** -
  - Creating awareness among people.
  - Support for building up a reproductively healthy society.
- **Various steps to create to Awarness** –
  - With the help of audio-visual and the print-media governmental and Non-governmental agencies.
  - Parents, other close relatives, teachers and friends, also have a major role in the dissemination of the above information.
  - Introduction of sex education in schools.
  - Proper information about reproductive organs, adolescence and related changes, safe and hygienic sexual practices, sexually transmitted diseases (STD), AIDS, etc.
  - Educating people, especially fertile couples and those in marriageable age group, about available birth control options, care of pregnant mothers, post-natal care of the mother and child, importance of breast feeding, equal opportunities for the male and the female child, etc.
  - Awareness of problems due to uncontrolled population growth, social evils like sex-abuse and sex-related crimes, etc.
- **Better awareness about sex related matters, increased –**
  - Number of medically assisted deliveries and better post-natal care leading to decreased maternal and Infant mortality rates.
  - Increased number of couples with small families.
  - Better detection and cure of STDs.
  - Overall increased medical facilities for all sex-related problems, etc.
  - All indicate improved reproductive health of the society.
- **Successful implementation of various action plans to attain reproductive health requires –**
  - Strong infrastructural facilities
  - Professional expertise
  - Material support.
  - These are essential to provide medical assistance
  - Care to people in reproduction-related problems like pregnancy, delivery, STDs, abortions, contraception, menstrual problems, infertility, etc.

- Implementation of better techniques and new strategies from time to time are also required to provide more efficient care and assistance to people.
- Massive child immunisation, etc.
- Research on various reproduction-related areas are encouraged and supported by governmental and non-governmental agencies to find out new methods and/or to improve upon the existing ones.

- **AMNIOCENTESIS** - A foetal sex determination test based on the chromosomal pattern in the amniotic fluid surrounding the developing embryo
- **SAHELI**
  - 'Saheli'–a new oral contraceptive for the females
  - Was developed by scientists at **Central Drug Research Institute (CDRI)** in Lucknow, India

**Population explosion and birth control**

- Increased health facilities along with better living conditions had an explosive impact on the growth of population.
- The world population which was around 2 billion (2000 million) in 1900 rocketed to about 6 billions by 2000.
- Our population which was approximately 350 million at the time of our independence reached close to the billion mark by 2000 and crossed 1 billion in May 2000.
- That means, **every sixth person in the world is an Indian.**
- A rapid decline in **death rate, maternal mortality rate (MMR) and infant mortality rate (IMR)** as well as an increase in number of people in reproducible age are probable reasons for this.
- Through our RCH programmes, though we could bring down the population growth rate, it was only marginal.
- According to the 2001 census report, the population growth rate was still around 1.7 percent, i.e., 17/1000/year, a rate at which our population could double in 33 years.
- World population day - 11 July.
- **To motivate smaller families**
  - By using various contraceptive methods.
  - Advertisements - **"Hum Do Hamare Do"**
  - Many couples, have even adopted an **'one child norm'.**
  - Statutory raising of marriageable age of the female to 18 years and that of males to 21 years
  - Contraceptive methods
- **An ideal contraceptive**
  - User-friendly, easily available.
  - Effective and reversible with no or least side-effects.
  - It also should in no way interfere with the sexual drive, desire and/or the sexual act of the user.

## Contraceptive methods

- A wide range of contraceptive methods are presently available which could be broadly grouped into the following categories, namely

1. **Natural/Traditional:** Natural methods work on the principle of avoiding chances of ovum and sperms meeting.
   **(a) Periodic abstinence:** is one such method in which the couples avoid or abstain from coitus from day 10 to 17 of the menstrual cycle when ovulation could be expected.

- As chances of fertilisation are very high during this period, it is called the fertile period or window period.
- Therefore, by abstaining from coitus during this period, conception could be prevented.

**(b) Withdrawal or coitus interruptus** - is another method in which the male partner withdraws his penis from the vagina just before ejaculation so as to avoid insemination.

**(c) Lactational amenorrhea** (absence of menstruation) **method** - is based on the fact that ovulation and therefore the menstrual cycle do not occur during the period of intense lactation following parturition.

- Lactational amenorrhoea is due to high prolactin level which keeps FSH and LH suppressed.
- Therefore, as long as the mother breast-feeds the child fully, chances of conception are almost nil.
- However, this method has been reported to be effective only upto a maximum period of six months following parturition.
- As no medicines or devices are used in these methods. Side effects are almost nil, chances of failure, though, of these methods are also high.

**2. Barrier methods -** ovum and sperms are prevented from physically meeting with the help of barriers. Such methods are available for both males and females.

**(a) Condoms -** are barriers made of thin rubber/latex sheath that are used to cover the penis in the male or vagina and cervix in the female, just before coitus so that the ejaculated semen would not enter into the female reproductive tract.

- **'Nirodh'** is a popular brand of condom for the male (Manufactured by Hindustan Latex Ltd.).

Condom for male

- Use of condoms has increased in recent years due to its additional benefit of protecting the user from contracting STDs and AIDS.
- Both the male and the female condoms are disposable, can be self-inserted and thereby gives privacy to the user.

Female condom

**(b) Diaphragms, cervical caps and vaults** - are also barriers made of rubber that are inserted into the female reproductive tract to cover the cervix during coitus.

Diapharm Cervical cap Vault cap

- They prevent conception by blocking the entry of sperms through the cervix.
- They are reusable.

**Spermicidal creams**, **jellies** and **foams** are usually used alongwith these barriers to increase their contraceptive efficiency. They contain nanoxynol.

Spercide Cream

3. **Intra uterine devices (IUDS):** These devices are inserted by doctors or expert nurses in the uterus through vagina. These Intra Uterine Devices are presently available as

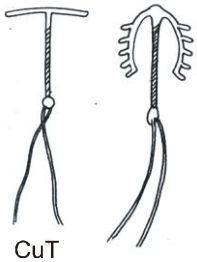
**(a)** The **non-medicated** IUDs (e.g., **Lippes loop, Paragard**).

Surprisingly, the mere presence of an inert foreign body in the uterus somehow prevents pregnancy. Leucocytes accumulate in the uterine fluid in response to the foreign body. They probably destroy the sperms and prevent fertilization at the same time, make the endometrium unsuitable for implantation.

**(b) Copper releasing** IUDs (**CuT, Cu7, Multiload 375**).

**(c)** The **hormone releasing** IUDs (**Progestasert, LNG-20**).

- **IUDs** increase phagocytosis of sperms within the uterus.
- The **Cu ions** released suppress sperm motility and the fertilising capacity of sperms.


CuT

Multiload 375

- The **hormone** releasing **IUDs**, in addition, make the uterus unsuitable for implantation and the cervix hostile to the sperms.


Hormone Injection

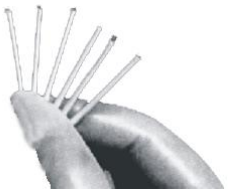
- IUDs are **ideal contraceptives** for the females who want to delay pregnancy and/or space children.
- It is one of **most widely accepted methods** of contraception in India.

4. **Oral contraceptives -** administration of small doses of either progestogens or progestogen–estrogen combinations is another contraceptive method used by the females.
   - They are used in the form of tablets and hence are popularly called the **pills**.


Oral Contraceptive Pills

- Pills have to be taken daily for a period of 21 days starting preferably within the first five days of menstrual cycle.
- After a gap of 7 days (during which menstruation occurs) it has to be repeated in the same pattern till the female desires to prevent conception.
- They inhibit ovulation and implantation as well as alter the quality of cervical mucus to prevent/ retard entry of sperms.
- **Pills** are very effective with lesser side effects and are well accepted by the females.
- **Saheli –** the new oral contraceptive for the females contains a non-steroidal preparation - centchroman. That does not affect ovulation, instead it prevents implantation. Its mechanism of action is based on anti-oestrogenic activity.
- It is a 'once a week' pill with very few side effects and high contraceptive value.
- Mala-D and Mala-N are daily oral contraceptives.
- Progestogen only pill (POP), this pill is commonly referred to as "minipill" or "micropill". It contains only progesterone, which is given in small dose throughout the cycle. The commonly used progestrogens are Levonorgestrel.
- The pills
  (i) Inhibit ovulation
  (ii) Inhibit implantation
  (iii) They alter the quality of cervical mucus to prevent/retard the entry of sperms. Pills are very effective with lesser side effects and are well-accepted by the females.
- The oral pills generally contain, progestogen-estrogen combination. A negative feedback on the pituitary by these hormones blocks FSH and LH release so that no ovum develops. They primarily prevent ovulation.

5. **Injections or implants -** Progestogens alone or in combination with estrogen can also be used by females as injections or implants under the skin.
   Norplant is an implant. Six capsules surgically implanted under the skin, slowly release hormone that blocks ovulation .Works for a period of 5 years.
   DMPA (Depot Medroxy Progesterone Acetate) is contraceptive injection, effective for 3 months.



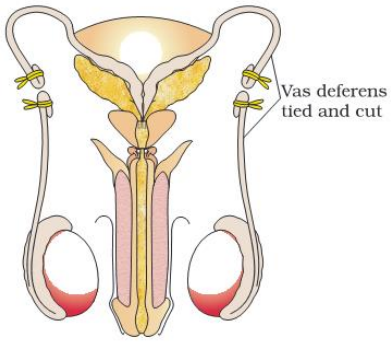
Implants

- Their mode of action is similar to that of pills and their effective periods are much longer.
- Administration of progestogens or progestogen-estrogen combinations or IUDs within **72 hours of coitus** have been found to be very effective as **emergency contraceptives**
- As they could be used to avoid possible pregnancy due to rape or casual unprotected intercourse.

6. **SURGICAL METHODS:** Also called **sterilisation**
   - Generally advised for the male/female partner as a terminal method to prevent any more pregnancies.
   - Surgical intervention blocks gamete transport and thereby prevent conception.
   - **Sterilisation** procedure in the male is called '**vasectomy**' and that in the female, '**tubectomy**'.

   **Vasectomy**

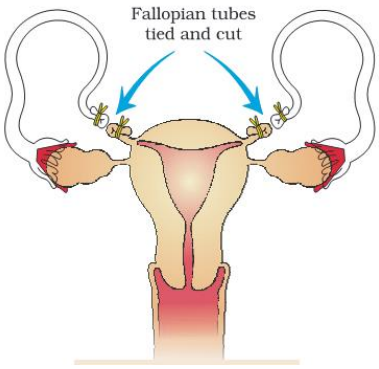
- In **vasectomy**, a small part of the vas deferens is removed or tied up through a small incision on the scrotum.




Vasectomy

### Tubectomy

- In **tubectomy**, a small part of the fallopian tube is removed or tied up through a small incision in the abdomen or through vagina.




Tubectomy

- These techniques are highly effective but their reversibility is very poor.
- Gossypot ($C_{30}H_{30}O_8$) present in cotton seed is used as male contraceptive.

## Medical termination of pregnancy (MTP)

- Intentional or voluntary termination of pregnancy before full term is called medical termination of pregnancy (MTP) or **induced abortion**. Obviously, MTP has a significant role in decreasing the population though it is not meant for that purpose.
- Nearly 45 to 50 million MTPs are performed in a year all over the world which accounts to 1/5th of the total number of conceived pregnancies in a year.
- Government of India legalised MTP in 1971 with some strict conditions to avoid its misuse.
- Why MTP? Obviously the answer is–to get rid of unwanted pregnancies either due to casual unprotected intercourse or failure of the contraceptive used during coitus or rapes.
- MTPs are also essential in certain cases where continuation of the pregnancy could be harmful or even fatal either to the mother or to the foetus or both.
- MTPs are considered relatively safe during the first trimester, i.e., upto 12 weeks of pregnancy. However legal limit is upto 20 week.
- Second trimester abortions are much more riskier.

## Sexually Transmitted Diseases (STDS)

- Diseases or infections which are transmitted through sexual intercourse are collectively called **sexually transmitted diseases (STD)**.
- Also called **venereal diseases (VD)** or **reproductive tract infections (RTI)**.
- **Gonorrhoea, syphilis, genital herpes, chlamydiasis, genital warts, trichomoniasis, hepatitis-B** , **HIV** leading to **AIDS** are some of the **common STDs**.
- Among these, **HIV** infection is most dangerous.
- Some of these infections like **hepatitis–B** and **HIV** can also be transmitted by sharing of injection needles, surgical instruments, etc. with infected persons, transfusion of blood, or from an infected mother to the foetus too.
- Except for hepatitis-B, genital herpes and HIV infections, other diseases are completely curable if detected early and treated properly.
- Early symptoms of most of these are minor and include itching, fluid discharge, slight pain, swellings, etc., in the genital region.
- Infected females may often be asymptomatic and hence, may remain undetected for long.
- Absence or less significant symptoms in the early stages of infection and the social stigma attached to the STDs, deter the infected persons from going for timely detection and proper treatment.
- This could lead to complications later, which include **Pelvic Inflammatory Diseases (PID)**, abortions, still births, ectopic pregnancies, infertility or even cancer of the reproductive tract.
- Though all persons are vulnerable to these infections, their incidences are reported to be very high among persons in the age group of 15-24 years.
- **Prevention**
  (i) Avoid sex with unknown partners/multiple partners.
  (ii) Always use condoms during coitus.
  (iii) In case of doubt, go to a qualified doctor for early detection and get complete treatment if diagnosed with disease.

### Sexually Transmitted Diseases

| | Disease | Symptoms | Pathogen |
|---|---|---|---|
| **1.** | AIDS | Immune system failure and susceptibility to opportunistic infections. | Human Immunodeficiency Virus (HIV) |
| **2.** | Chlamydiasis | Painful urination and penile discharge in males; vaginal discharge and abdominal pain in females. | *Chlamydia trachomatis* (bacterium) |
| **3.** | Genital herpes | Painful blisters on genital region, thighs or buttocks and flu-like symptoms. | Herpes Simplex Virus (HSV-II) |
| **4.** | Genital warts | Warts on genital or anal region. | Human Papiloma Virus (HPV) |
| **5.** | Gonorrhoea | Painful urination and penile discharge in males; vaginal discharge and abdominal pain in females. | *Neisseria gonorrhoeae* (bacterium) |
| **6.** | Hepatitis-B | Chilis, headache, malaise and jaundice, malaise refers to discomfort related to disease. | Hepatitis-B virus |
| **7.** | Syphilis | Chancre (painless ulcer) on penis; chancre in vagina or on cervix in females; fever rash. | *Treponema pallidum* (bacterium) |
| **8.** | Trichomoniasis | Vaginal discharge in females. | *Trichomonas vaginalis* (protozoan) |

## Infertility

- A large number of co**up**les all over the world including India are **infertile, *i.e.,* they are unable to produce children in spite of unprotected sexual co-habitation.** The reasons for this could be many - physial congen**it**al, diseases, drugs, immunological or even psychological.
- In India, often the female is blamed for the couple being childless, but more often than not, the problem lies in the male partner.
- **Infertility in Males**
  Semen of a fertile is 2.5 to 5 ml per ejaculation with a sperm count of over 200-300 million, mostly motile, having proper fructose content and fluidity which is deposited high in the vagina. Any defect in sperm count, sperm structure, sperm motility of seminal fluid leads to infertility. Low sperm count is called **oligospermia** which near absence of sperms is known as **azoospermia.** Low sperm motility is called **asthenozoospermia** while defective sperm morphology is termed as **teratozoospermia.** Various causes of infertility in males include:

1. **Cryptorchidism** or failure of testes to descend into scrotum.
2. Absence or blockage of vasa deferentia.
3. Hyperthermia or higher scrotal temperature due to varicocele (varicose veins), hydrocele or filariasis, tight undergarment, thermal undergarment or working in hot environment cause oligospermia or depressed spermatogenesis.
4. Infections like mumps after puberty (orchitis or inflammation of testes), bronchiectasis (cronic dilation of bronchioles) and infection of seminal vesicles or prostate result in oligospermia. Infections of *Chlamydia trachomatis* and *T.mycoplasma* (= *Ureoplasma*) also cause oligospermia.
5. Alcoholism inhibits spermatogenesis.
6. Klinefelter's syndrome.
7. Gonadotropin deficiency.
8. Cytotoxic drugs, radiations, antidepressant and anticonvulsant drugs supress spermatogenesis.
9. Low fructose content, high prostaglandin content, high viscosity and low volume of ejaculate lead to male infertility.

**Infertility in Females**

A fertile woman is the one who regularly ovulates once every cycle, passes the egg down the reproductive tract which develops conditions for smooth passage of sperms and implantation of fertilised egg. The various causes of infertility in females are as follows:

1. **Anovulation** (nonovulation) and **oligoovulation** (deficient ovulation) are caused by deficient functioning of hypothalamo-pituitary complex or secondarily by thyroid and adrenal dysfunction.
2. Indequate growth and functioning of corpus luteum resulting in reduced progesterone secretion and deficient secretory changes in endometrium. It is called luteal phase defect. It inhibits implantation.
3. The ovum is not liberated but remains trapped inside the follicle due to hyperprolactinaemia.
4. Fallopian tube may fail to pick up ovum, have impaired motility, loss of cilia and blocked lumen. The defects may be caused by infection or endometriosis.
5. Noncanalisation of uterus.
6. Defective uterine endometrium due to reduced or excessive secretory activity.
7. Congenital malformation of uterus.
8. Fibroid uterus.
9. Defects in cervix like congenital elongation, occlusion of cervix by a polyp, cervicitis, scanty or excessive cervical mucus and presence of antisperm antibodies.
10. Defective vaginal growth.

- Specialised health-care units (infertility clinics, etc.) could help in diagnosis and corrective treatment of some of these disorders and enable these couples to have children. However, where such corrections are not possible, the couples could be assisted to have children through certain special techniques commonly known as **assisted reproductive technologies** (ART).
- Among 15-30% of couples, infertility is a problem. Male infertility may be due to insufficient numbers of sperm and/or theiflnotility. Normally, the ejacula has a volume of 3 to 4 ml with approximately 200 to 300 million sperms of which for normal fertility, at least 60 percent sperms must have normal shape and size and for at least 40 percent of them must show vigorous motility.

1. ***In vitro* fertilisation (IVF-fertilisation)** outside the body in almost similar conditions as that in the body followed by embryo transfer (ET) is one of such methods. In this method, popularly known as **test-tube baby** programme, ova from the wife/donor (female) and sperms from the husband/donor (male) are collected and are induced to form zygote under simulated conditions in the laboratory. The **zygote or early embryos** (with upto 8 blastomeres) could then be transferred into the fallopian tube **(ZIFT-zygote intra fallopian transfer)** and embryos with more than 8 blastomeres, into the uterus IUT - intra uterine transfer), to complete its further development. Embryos formed by ***in vivo* fertilisation** (fusion of gametes with in the female) also could be used for such transfer to assist those females who cannot conceive.

- The first *in vitro* fertilisation baby, Louis Brown, was born in England in July, 1978. During an *in vitro* fertilisation procedure, an egg is taken from the female, sperm is taken from male, and fertilisation occurs externally. The zygote is released into the woman's fallopian tubes, implantation then can proceed.

2. **Gamete Intra Fallopian Transfer (GIFT)** involves transfer of an ovum collected from a donor into the fallopian tube of another female who cannot produce one, but can provide suitable environment for fertilisation and further development.
3. **Intra cytoplasmic sperm injection (ICSI)** is another specialised procedure to form an embryo in the laboratory in which a sperm is directly injected into the ovum.
4. **Artificial insemination (AI)** technique helps to correct infertility cases either due to inability of the male partner to inseminate the female or due to very low sperm counts in the ejaculates. In this technique, the semen collected either from the husband or a healthy donor is artificially introduced either into the vagina or into the uterus **(IUI - intra-uterine insemination)** of the female.

### Limitations of methods of ART are:

1. All these techniques require extremely high precision handling by specialised professionals and expensive instrumentation, therefore, these facilities are presently available only in very few centres in the country
2. Their benefits is affordable to only a limited number of people.
3. Emotional, religious and social factors are also deterrents in the adoption of these methods.
   Since the ultimate aim of all these procedures is to have children, in India we have so many orphaned and destitute children, who would probably not survive till maturity, unless taken care of. Our laws permit leg adoption and it is as yet, one of the best methods for couples looking for parenthood.

- The reasons for this could be many–physical, congenital, diseases, drugs, immunological or even psychological In India, often the female is blamed for the couple being childless, but more often than not, the problem lies in the male partner.
- Specialised **health care units** (infertility clinics, etc.) could help in diagnosis and corrective treatment of some of these disorders and enable these couples to have children.

## Test your Resonance with concept

**1.** Which of the following is common among condoms and diaphragm?

(1) Available for males only (2) Provide protection against STD

(3) Prevent meeting of sperm and ovum (4) Prevent ovulation

**2.** The reason to legalise conditional MTPs by the Government of India is

(1) To decrease the population growth rate

(2) To check indiscriminate illegal male foeticide

(3) To check illegal female foeticide which is reported high in India

(4) To check pregnancies

**3.** Following STDs are completely curable if detected at early stage, except

(1) Chlamydiasis (2) Trichomoniasis (3) Gonorrhoea (4) Hepatitis B

**4.** A technique that involves injection of a sperm directly into cytoplasm of ovum is

(1) GIFT (2) IUI (3) ICSI (4) AI

**5.** Some couple avoid pregnancies by opting natural birth control method. Which of the following is not included under this method?

(1) Coitus interruption (2) Periodic abstinence

(3) Lactational amenorrhoea (4) Spermicide

### Answers

1. (3) **2.** (3) **3.** (4) **4.** (3) **5.** (4)

### Some Biological Terms:

| | | |
|---|---|---|
| **IVF-ET** | **:** | *In vitro* fertilisation and embryo transfer |
| **GIFT** | **:** | Gamete intra-fallopian transfer |
| **ZIFT** | **:** | Zygote intra-fallopian transfer |
| **IUI** | **:** | Intra-uterine insemination |
| **POST** | **:** | Peritoneal oocyte and sperm transfer |
| **SUZI** | **:** | Subzonal insemination |
| **ICSI** | **:** | Intra-cytoplasmic sperm injection |
| **TESE** | **:** | Testicular sperm extraction |
| **MESA** | **:** | Microsurgical epididymal sperm aspiration. |