HUMAN REPRODUCTIVE HEALTH

Key Terms/Abbreviations

- 1. **WHO** World Health Organisation
- 2. **RCH** Reproductive and Child Health care
- 3. Amniocentesis It is a foetal sex determination test based on the chromosomal pattern in the amniotic cells of amniotic fluid surrounding the developing embryo. At present amniocentesis is banned legally
- 4. **CDRI** Central Drug Research Institute Lucknow
- 5. **MMR** Maternal Mortality Rate
- 6. **IMR** Infant Mortality Rate
- 7. **Lactational amenorrhea** Lack of ovulation and menstruation during the early period of lactation after parturition
- 8. **IUDC** Intra Uterine Devices
- 9. Non-medicated IUs Lippes loop
- 10. Copper releasing IUDs: CuT, cu 7 and multiload 375
- 11. Hormone releasing IUDB- Progestasert LNG-20
- 12. **Oral contraceptive pills:** Tablets that contain progestogens and estrogen, when administered orally for a period of 21 days starting, preferably with in the first 5 days of menstrual cycle. They inhibit ovulation and implantation.
- 13. **Saheli:** "Once a week pill". It is a new oral contraceptive pill that contains non-steroidal preparation called centchroman
- 14. **Sterilisation**: It is a terminal method to prevent any more pregnancies. It blocks gamete transport and prevent conception

Vasectomy: It is male sterilisation. A small part of vasdeferens is removed or tied up through small incision on the scrotum.

- **Tubectomy**: It is female sterilization. A small part of fallopian tube is removed or tied up through small incision in the abdomen or through vagina.
- 15. **MTP**: Medical termination of pregnancy. It is voluntary termination of pregnancy before full term. It is also called induced abortion. Govt. of India legalized MTP in 1971. MTPs are considered to be safe during the first trimester, i.e., up to 12 weeks of pregnancy. Afterwards it is not safe.

16.	STDs	Sexually transmitted diseases. These are diseases or infections which are transmitted through sexual intercourse. They are also known as venereal diseases or reproductive track infections
		Examples for STDs: Gonorrhea, syphilis, genital herpes, chlamydiasis genital warts, trichomoniasis, HIV & Hepatitis B
17.	ART:	Assisted Reproductive Technologies. These are some special techniques that help the couple to have children in case of delay for natural conception. These are IVT, ZIFT, GIFT, AI and IUI. (Intra Uterine Insemination)
18.	IVF:	In vitro fertilization .This is fertilization out side the body in almost similar conditions as that in the body.
19.	ET:	Embryo Transfer: (Test Tube Baby Programme). After 'IVF' the embryo at '8' celled stage is transferred in to the uterus of female from whom the ovum is collected.
20.	ZIFT:	Zygote intra fallopian transfer. Embryos with more than 8 blastomere stage are transferred
21.	IUT:	Intra uterine transfer of embryos. With more than 8 blastomere stage embryos are transferred into uterus of the intended female to complete development.
22.	GIFT:	Gamete Intra Fallopian Transfer. Transfer of a ovum collected from a donor into the fallopian tube of another female who can not reproduce.
23.	ICSI:	Intracytoplasmic Sperm Injection. It is a kind of 'ART' in which a sperm is directly injected into the ovum.
24.	AI:	Artificial insemination. It is also a kind of ART in which semen collected from the husband or a healthy donor is artificially introduced either in to vagina or into the uterus of the female
25.	DMPA:	depot - medroxyprogesterone acetate. It is an injectable contraceptive. 150mg every three months or 300mg every six months

REPRODUCTIVE HEALTH: Reproductive Health is a state of physical, emotional, behavioral and social fitness for leading a responsible, safe and satisfying reproductive life. Briefly speaking, reproductive health refers to healthy reproductive organs with normal functions.

REPRODUCTIVE HEALTH-PROBLEMS AND STRATEGIES

Problems

Early Marriage: Children often get married as soon as they attain puberty.

Teenage Lady: The teenage lady is not physically fit to bear the foetus and nourish it properly.
Deformities: Deformities are common in children of early marriage.
MMR and IMR: Maternal and infant mortality rates are high.
Health of Ladies: The ladies remain weak, anemic and an easy prey to several diseases.
Population Growth: There has been a surge in population size.

Strategies for Population Control:

General Awareness: With the help of audio-visual aids, print media, primary health centers, both government and non-government agencies are engaged in creating general awareness among people about various aspects of reproduction.

Sex Education: It has been included in school curricula. Proper sex education helps in removing myths and misconceptions about various sex related aspects, reproductive organs, changes during adolescence, harms of early sex, hygienic sexual practices, sexually transmitted diseases, etc.

Family Welfare Information: Fertile couples and all other persons of marriageable age must be educated about available birth control options, reasons for fertility control, care of would-be-mothers, post-natal care of mother and child, importance of breast feeding, providing equal opportunities to male and female children and desired size of the family where every child can be given due attention, care and education.

Uncontrolled Population: The harmful effect of uncontrolled population explosion must be known to everybody so that one should not only feel responsible, but also act responsible.

Sex Determination: There is now a statutory ban on determination of foetal sex through **amniocentesis** (determination of chromosome number and type in cells found in amniotic fluid) and **sonography** (observation of genitalia and follicles).

- v Marriageable Age: Child marriages have been banned in India. The minimum marriageable age is now 21 years for boys and 18 years for girls.
- v **Research:** Research into improved techniques of contraception is a continuing process. Saheli, a new non steroidal contraceptive once-a-week pill has been developed by Central Drug Research Institute (CDRI), Lucknow, India.

Birth Control

Few topics in modern society generate as much controversy as birth control. **Birth control** is any method or device that prevents births. Birth control measures fall into two broad categories: (1) **contraception**, ways of preventing pregnancy, and (2) **induced abortion**, the deliberate expulsion of a foetus.

Contraceptive Measures Help Prevent Pregnancy

Effectiveness is expressed as a percentage. A 95% effectiveness rating means that 95 women out of 100 using a certain method in a year will not become pregnant.

A. Natural Methods

They are methods which do not require any device, medicine or religious sanction. Natural methods are of three kinds—safe period, withdrawal and breast feeding.

(i) **Safe Period** (Rhythm Method). Ovulation occurs roughly about the middle of menstrual cycle. Fertility period when fertilization can occur is up to 48 hours after ovulation. Avoiding sex during the fertility period will naturally prevent conception. Ovulation period can be known as the temperature of the body dips to below average and then rises by about 1°F remaining there during the rest of the cycle.

Cervical mucus is slippery and can be drawn into a thread (Spinnbarkeit test) when stretched between two fingers. Period prior to ovulation is safe. Period after fourth day of rise in temperature (or last positive Spinnbarkeit test) is also considered safe. It is, however, always better to avoid sex from day 10-17 of the menstrual cycle.

(ii) Withdrawal Method (Coitus Interruptus). The method is based on withdrawal of penis before ejaculation.

(iii) **Lactational Amoenorrhoea:** Just after parturition, there is a phase of amoenorrhoea or absence of menstruation. It is also the phase of intense lactation. Breast feeding of the child fully prevents conception. The method is, however, effective only upto a maximum period of six months.

B. Barrier Methods

They are mechanical devices which prevent the deposition of sperms into vagina and their passage into uterus. Further, they can be self inserted by the user in complete privacy. The common barrier methods are condoms, diaphragm, fem shield and cervical cap.

(i) **Condom.** It is tubular latex sheath which is rolled over the male copulatory organ during sex. The common brand provided by family welfare services is Nirodh. The device also provides protection against sexually transmitted diseases including AIDS.

(ii) **Diaphragm.** It is a tubular rubber sheath with a flexible metal or spring ring at the margin which is **fitted inside the vagina.**

(iii) **Fem Shield** (Female Condom). The device is polyurethane pouch with a ring at either end. The inner ring is smaller and present at the inner closed end. The device covers the external genitalia as well as lines the vagina. Fem shield provides protection from sexually transmitted diseases.

(iv) **Cervical Cap:** It is rubber nipple which is fitted over the cervix and is designed to remain there by suction. The device prevents the entry of sperms into uterus.

(v) **Vault Cap.** It is hemispheric dome like rubber or plastic cap with a thick rim which is meant for fitting over the vaginal vault over the cervix.

C. Chemical Methods

They are contraceptives which contain spermicidal chemicals. The chemical contraceptives are available in the form of creams (e.g., delfen), jelly (perceptin, volpar paste), foam tablets (e.g., aerosol foam, chlorimin T or contab). They commonly contain lactic acid, boric acid, citric acid, zinc sulphate and potassium permanganate. The contraceptives are introduced in vagina prior to sex. **Sponge** (Today) is a foam suppository or tablet containing nonoxynol-9 as spermicide. It is moistened before use to activate the spermicide. The device also absorbs ejaculate.

D. Oral Contraceptives (The Pills)

The **birth control pill** is the most effective temporary means of birth control available. Birth control pills come in several varieties, but the most common is the combined pill. It contains a mixture of synthetic estrogen and progesterone. These hormones inhibit the release of LH and FSH, in turn, inhibits follicle development and ovulation. A minipill containing progesterone alone is also available. Even though it is less effective than the combined pill, the minipill is more suitable for some women because it results in fewer side effects.

E. Intrauterine Device

The next most effective means of birth control is the **intrauterine device** (**IUD**). The IUD is one of the least used birth control measures. It consists of a small plastic or metal object with a short string attached to it. IUDs are inserted into the uterus by a physician, usually during menstruation, because the cervical canal is widest then and because menstrual bleeding indicates that the woman is not pregnant.

No one knows exactly how the IUD works. Some researchers think that the IUD increases uterine contractions, making it difficult for the eary embryo to attach and implant in the wall of the uterus. Others think that the IUD creates a local inflammatory reaction in the uterine lining, resulting in an inhospitable environment for a newly formed embryo. As a result, implantation is blocked. It is possible that both mechanisms are operating.

Like other forms of birth control, IUDs have adverse effects. In some cases, the uterus expels the device, leaving a woman unprotected. Expulsion usually occurs within a month or two of insertion. The IUD may also cause slight pain and increase menstrual bleeding. These effects, however, are minor compared with two much rarer complications; uterine infections and perforation (a penetration of the uterine wall by an IUD). Women with IUDs are more likely to develop uterine infections than women practicing other forms of birth control. If not treated quickly, infections can spread to the uterine tubes, where scar tissue develops. This can block the transport of sperm and ova, causing sterility. Perforation of the uterus is a life-threatening condition requiring surgery to correct. The non-medicated or inert IUDs are often referred to as first generation IUDs and comprise the Lippes loop. The copper IUDs comprise the second generation IUDs which release metal ions which have a strong anti fertility effect. **Ex:** CuT-200, CuT-380A, Multiload 375. The third generation IUDs releases hormones like progestasert which have a direct local effect on the uterine lining, on the servical mucas and posibly on sperms.

F. Implants

They are hormone containing devices which are implanted subdermally for providing long term contraception. Norplant is progestin only device having six small permeable capsules ($34 \text{ mm} \times 2.4 \text{ mm}$) each having about 36 mg levonorgestrel. They are inserted under the skin in a fan shaped manner inside upper arm or forearm through a small incision. Suturing is not required. Norplant remains effective for about 5 year **Implanon** is a single rod-like device ($40 \text{ mm} \times 2 \text{ mm}$) which is implanted through a wide bored needle. It contains about 60 mg of 3-keto desogestrel. It remains functional for three years.

G. Surgical Methods of Family Planning

They are also called **terminal methods of family planning.** Surgical methods are permanent methods of family planning where there is no need of replacement or augmentation but the reversibility is poor. The methods are operative procedures which block the passage of semen in males and ova in females. The techniques are also called **sterilization procedures.** They are called vasectomy in males and tubectomy in females.

Vasectomy (L. vas—vessel, ekotme—excision). It is a surgical method of sterilization of males. Vasa deferentia are blocked by cutting and occluding them so that sperms are unable to pass down the male reproductive system.

(i) **Conventional Vasectomy** (Scalpel Surgery). Under local anesthesia, transverse 1 cm incision is made through the skin of the scrotum with the help of the scalpel over the area of vasa deferentia. Each vas is exposed and cut. The two ends are separated and tied. A gap of 1-4 cm is must between the two ends otherwise reunion can occur.

(ii) **No-scalpel Vasectomy.** Here instead of scalpel, a dissecting forceps and a ringed forceps are required. The skin is punctured and the vas is taken out. It is occluded by removal of 1-2 cm followed by ligation of ends. Occlusion can also be achieved by heat and clips. Vasectomy is a reversible procedure as the cut ends can be joined together to open the sperm passage.

Tubectomy (L.tubus–pipe, ektome–excision). It is a surgical procedure of female sterilisation where a portion of both the fallopian tubes is excised or ligated to block the passage of ovum through them. Tubectomy is performed by conventional transabdominal surgery, conventional laparotomy and minilaparotomy. In surgical procedures, the fallopian tubes are cut and the cut ends tied to prevent reunion. The procedure is reversible as the cut ends can be rejoined. In laparoscopic procedure, sterilization is achieved by loop development and constricting the basal region of loop with the help of silastic ring either through a small incision in the abdomen or through vagina.

H. Medical Termination of Pregnancy (MTP)

It is voluntary or intentional abortion induced and performed to end pregnancy before the completion of full term. Worldwide, nearly 20% of the total pregnancies get aborted. The number of MTPs is 40-50 million/yr. Therefore, MTPs have a significant role in containment of population, though they are not performed for this purpose. They are mainly meant for removing unsustainable pregnancies. Many countries do not have a law about MTPs because the latter involve emotional, ethical, religious and social issues. However, in India there is a proper act, **Medical Termination of Pregnancy Act**, **1971.** It is mainly meant for preventing unnatural maternal deaths due to unsafe abortions (8.9% of the total maternal deaths). The act has been amended in 2002. Under this act termination of pregnancy can be done up to 20 weeks, if pregnancy is likely to produce a congenitally malformed child, is a result of rape and contraceptive failure or is likely to harm the mother.

MTP is safe if it is performed up to 12 weeks (first trimester) of pregnancy. Misoprostol (a prostaglandin) along with mifepristone (antiprogesterone) is an effective combination. Vacuum aspiration and surgical procedures are adopted thereafter. Second semester abortion are risky. They are generally performed after testing the sex of the baby through amniocentesis or sonography. It has resulted in large scale female foeticide and complications due to unsafe abortions in the hands of untrained persons. To prevent such happening, the government has enacted a law, **Pre-Natal Diagnostic Techniques (Regulation and Prevention of Misuse) Act, 1994** with amendments in 2003. It prohibits post conception and prenatal sex determination. Contravention of this act is punishable with an imprisonment of 5 years and fine of Rs. 1, 00,000 along with cancellation of medical registration and license.

SEXUAL TRANSMITTED DISEASES

Certain bacteria and viruses can be transmitted by sexual contact. These organisms can penetrate the lining of the reproductive tracts of men and women and thrive in the moist, warm environment of the body. These organisms cause **sexually transmitted diseases (STDs).** Most of the infectious agents that cause STDs are spread by vaginal intercourse, but other forms of sexual contact such as anal and oral sex are responsible for their transmission. **AIDS, for example, can be transmitted** by anal sex as well as vaginal and (possibly) oral sex. Syphilis is caused by a bacterium that is spread by oral, anal, and vaginal sex.

Although STDs pass from one person to another during sexual contact, the symptoms are not confined to the reproductive tract. In fact, several STDs, including syphilis and AIDS, are primarily systemic diseases—that is, they affect entire body systems.

One complicating factor in controlling STDs is that occasionally some diseases such as gonorrhea produce no obvious symptoms in many men and women. As a result, the disease can be transmitted without a person knowing he or she is infected. In others such as AIDS, symptoms may not appear for weeks or even years after the initial infection. Thus, sexually active individuals who are not monogamous can transmit the AIDS virus to many people before they are aware that they are infected.

Gonorrhea is a Bacterial Infection that can spread to Many Organs

Gonorrhea is caused by a bacterium that commonly infects the urethra of men and the cervical canal of women. Gonorrhea often causes no symptoms. When they do appear, painful urination and a pus like discharge from the urethra are common complaints in men. Women may experience a cloudy vaginal discharge and lower-abdominal pain. If, a woman's urethra is infected, urination may be painful. Symptoms of gonorrhea usually appear about 1–14 days after sexual contact.

Gonorrhea is treated with antibiotics and clears up quickly, usually within 3 to 4 days, if treatment begins early. If left untreated, however, gonorrhea in men can spread to the prostate gland and the epididymis. They can be more difficult to treat. Moreover, infections in the urethra lead to the formation of scar tissue. This may narrow the urethra and make urination even more difficult. In some women, bacterial infection spreads to the uterus and uterine tubes, causing the buildup of scar tissue. In the uterine tubes, scar tissue may block the passage of sperm and ova, resulting in infertility. Gonorrheal infections can also spread into the abdominal cavity through the opening of the uterine tubes. If the infection enters the blood stream in men or women, it can travel throughout the body. Fortunately, gonorrhea can be treated by antibiotics, but early diagnosis is essential to limit the damage.

Syphilis is caused by a Bacterium and can be Extremely Debilitating if Untreated

Syphilis is a deadly STD caused by a bacterium Treponema pallidum that penetrates the linings of the oral cavity, vagina, and penile urethra. It may also enter through breaks in the skin. If untreated, syphilis proceeds through three stages. In stage 1, between 1 and 8 weeks after exposure, a small, painless red sore develops, usually in the genital area. Easily visible when on the penis, these sores often go unnoticed when they occur in the vagina or cervix. The sore heals **in 1-5 weeks**, leaving a tiny scar.

Approximately 6 weeks after the sore heals, individuals complain of fever, headache, and loss of appetite. Lymph nodes in the neck, groin, and armpit swell as the bacteria spreads throughout the body. This is stage 2. It lasts for about 4 to 12 weeks.

As a rule, the symptoms of stage 2 syphilis disappear for several years. Then, without warning, the disease flares up again. This is stage 3. During stage 3, an autoimmune reaction occurs. Patients experience a loss of their sense of balance and a loss of sensation in their legs. As the disease progresses, patients experience paralysis, senility, and even insanity. In some cases, the bacterium weakens the walls of the aorta, causing aneurysms.

Syphilis is diagnosed by the symptoms and by examining the pus under a microscope. Blood tests are also useful in stages 1 and 2. Syphilis can be successfully treated with antibiotics, but only if the treatment begins early. Suspicious sores in the mouth and genitals should be brought to the attention of a physician. In stage 3, antibiotics are useless. Tissue or organ damage is permanent.

Chlamydial Infections are Extremely common among College Students

One of the most common sexually transmitted diseases, affecting **3 to 10 million people each year**, and many of the college students, is known as chlamydia. It is caused by chlamydia trachomatis. This disease is characterized, in men, by a burning sensation during urination and a discharge from the penis. Women also experience a burning sensation during urination and a vaginal discharge. If the bacterium spreads, it can cause more severe infection and infertility. Like other STDs, many people experience no symptoms at all and therefore risk spreading the disease to others. Children born to mothers with chlamydia can develop eye infections and pneumonia.

Chlamydia bacteria often migrate to the lymph nodes, where they cause considerable enlargement and tenderness in the affected area. Blockage of the lymph nodes may result in tissue swelling in the surrounding tissue. **Doxycycline** and other antibiotics are effective in treating this disease.

Genital Herpes is caused by a Virus; it is Extremely Common, and Essentially Incurable

Genital herpes is another common sexually transmitted disease. Contacted by 200,000–300,000 people each year, genital herpes is caused by a virus that enters the body and remains there for life. The first sign of viral infection is pain, tenderness, or an itchy sensation on the penis or female external genitalia. These symptoms usually occur 6 days or so after contact with someone infected by the virus. Soon afterward, painful blisters appear on the external genitalia, thighs, buttocks, and cervix, or in the vagina.

The blisters break open and become painful ulcers that last for 1-3 weeks, then disappear. Unfortunately, the herpes virus is a lifelong resident of the body. New outbreaks can occur from time to time, especially when an individual is under stress. Recurrent outbreaks are generally not as severe as the initial one, and, in time, the outbreaks generally cease.

Herpes can be transmitted to other individuals during sexual contact only when the blisters are present or (as recent research suggests) just beginning to emerge. When the virus is inactive, sexual intercourse can occur without infecting a partner.

Although herpes cannot be cured, physicians can suppress outbreaks with antiviral drugs such as acyclovir. These drugs not only reduce the incidence of outbreaks, but also accelerate healing of the blisters.

Herpes is not a particularly dangerous STD, except in pregnant women. These women run the risk of transferring the virus to their infants at birth. Because the virus can be fatal to newborns, these women are often advised to deliver by cesarean section (an incision made just above the pubic bone) if the virus is active at the time of birth.

Non-gonococcal Urethritis is an extremely common disease caused by several types of Bacteria

Non-gonococcal urethritis, or **NGU** for short, is the most common sexually transmitted disease. Moreover, NGU is one of several STDs whose incidence is steadily rising in the United States. Caused by any of several different bacteria, this infection is generally less threatening than gonorrhea, syphilis, and chlamydia, although some infections can result in sterility.

Many men and women often exhibit no symptoms whatsoever and can therefore spread the disease without knowing it. In men, when symptoms occur, they resemble those of gonorrhoea—painful urination and a cloudy mucous discharge from the penis. In women, urination becomes painful and more frequent. NGU can be treated by antibiotics, but individuals should seek treatment quickly to avoid the spread of the disease and more serious complications.

Genital Warts are caused by Human Papillomavirus (HPV)

The vast majority of Americans carry a virus known as **human papillomavirus** or **HPV**. Transmitted by sexual contact, this virus can cause **gential warts**. Genital warts are benign growths that appear on the external genitalia and around the anuses of men and women. Warts generally occur in individuals whose immune systems are suppressed, for example, after long periods of stress.

These warts can remain small or can grow to cover large areas. They may cause mild irritation, and certain strains of HPV area associated with cervical cancer in women.

Genital warts can be treated with chemicals or removed surgically—although rates of recurrence are quite high. In 20% to 30% of the cases, genital warts disappear spontaneously. Getting rid of the virus, however, is impossible, for it resides in the body forever.

INFERTILITY:

Infertility (L. in–not, fertilis–fruitful) is the failure to conceive when after 1-2 years of regular unprotected sex. The term is not synonym of **sterility** which means complete inability to produce offspring. Infertility can best be defined as relative sterility. It is of two types, primary and secondary. **Primary infertility** is the infertility found in patients who have never conceived. **Secondary infertility** is found in patients who have never conceived. Secondary infertility is found in patients who have never conceived. Secondary infertility is found in patients who have never solved by defects found in males, females as well as both.

Infertility in Males

Semen of a fertile male is 3-4 ml per ejaculation with a sperm count of over 100 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 or seminal fluid leads to infertility. Low sperm count is called **oligospermia** while near absence of sperms is known as **azospermia**. Low sperm motility is called **asthenozoospermia** while defective sperm morphology is termed as **teratozoospermia**.

Cryporchidism is failure of testes to descend into scrotum. It causes azospermia, blockage of vasa deferentia and vasa efferentia. Loss of ciliary function and sperm motility due to autosomal recessive disorder of kartagener syndrome.

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 Alcoholism inhibits spermatogenesis.

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 fertilized egg. The various causes of infertility in females are as follows.

Anovulation (non-ovulation) and **oligoovulation** (deficient ovulation) are caused by deficient functioning of hypothalamo-pituitary complex or secondarily by thyroid and adrenal dysfunction. Inadequate 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. Major reason is decrease in FSH or LH level and elevation of prolactin level. The ovum is not liberated but remains trapped inside the follicle due to hyperprolactinaemia. 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. Non-canalization of uterus.

IN VITRO FERTILISATION

(IVF-fertilization 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 from ozgote under simulated conditions in the laboratory. The zygote or early embryos (with up to 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 within the female) also could be used for such transfer to assist those females who cannot conceive.

Transfer of an ovum collected from a donor into the fallopian tube (GIFT-gamete intra fallopian transfer) of another female who cannot produce one, but can provide suitable environment for fertilization and further development is another method attempted. Intra cytoplasmic sperm injection (ICSI) is another specialized procedure to form an embryo in the laboratory in which a sperm is directly injected into the ovum. Infertility cases either due to inability of the male partner to inseminate the female or due to very low sperm counts in the ejaculates, could be corrected by artificial insemination (AI) technique. 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.

Though options are many, all these techniques require extremely high precision handling by specialized professionals and expensive instrumentation. Therefore, these facilities are presently available only in very few centers in the country. Obviously their benefit is affordable to only a limited number of people. 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 legal adoption and it is as yet, one of the best methods for couples looking for parenthood.

