Reproductive Technologies

1. **The Control of Fertility**
   1. Tubal ligation – the surgical procedure in which the Fallopian tubes are cut and tied off to prevent the eggs from reaching the uterus, thus providing permanent sterility.
   2. Vasectomy – surgical procedure in which the vas deferens are cut and tied off to prevent sperm from reaching the urethra, thus providing permanent sterility.
2. **Contraception**
   1. Latex barriers – condom and diaphragm prevent sperm moving to the site of fertilization.
   2. Spermicidal foams, jellies, creams – kill the sperm while in the vagina
   3. Intrauterine device (IUD) – a plastic or metal device placed within the uterus thereby altering the environment so that the early embryo will not be implanted
   4. Oral Contraceptive (“the pill”) – estrogen and progesterone contained within the pill inhibit the production of FSH and LH by the pituitary gland. This in turn inhibits follicle growth and ovulation.
   5. Rhythm Method/Calendar Method (or Natural Family Planning) – abstinence of intercourse around the time of ovulation as determined by monitoring changes in basal body temperature and the viscosity of the cervical mucus.
3. **Non-Invasive Investigative Technologies**
   1. Ultrasound – sound waves inaudible to the human ear are bounced off internal organs and returning “echos” are detected. This technique is used to image deep organs such as the gall bladder and also to monitor fetal growth and detect fetal abnormalities
4. **Abortion**

The ending of pregnancy before the fetus is able to survive outside the womb. It can occur spontaneously (miscarriage) or it can be artificially induced.

1. Abortion during the first trimester
   1. “D and C” – cervical dilation and curettage (scrapping of the uterine cavity)
   2. Vacuum aspiration – drawing out by suction
2. Abortion during later stages of pregnancy by inducing premature labor
   1. Injection of a salt solution into the amniotic fluid
   2. Injection of prostaglandins into the uterine cavity
3. **The Treatment of Infertility (you must know the ones bolded for the diploma)**
   1. Artificial Insemination (AI) – the injection of semen into the cervical opening or uterus (semen may be provided by the husband, an anonymous donor or obtained from a frozen semen bank)
   2. **In-vitro fertilization (IVF)** – the procedure of egg recovery, egg fertilization and embryo development in a glass container, followed by embryo transfer to the uterus. Accompanied by hormonal therapy to produce multiple mature eggs.
   3. Gamete intrafallopian transfer (GIFT) – the procedure of placing eggs and sperm separately into the oviduct where fertilization takes place naturally
   4. Zygote intrafallopian transfer (ZIFT) – similar to GIFT, but fertilization happens externally and the zygote is transferred to the fallopian tube
   5. Assisted Hatching (Embryo Micromanipulation) - involves the creation of an opening in the outer covering of the embryo. This outer covering is known as the zona pellucida, of the embryo. This procedure is used to help the normal, growing embryo to emerge from the covering in order to properly implant in the uterus.
   6. Laparoscopy – the use of a fiberoptic device that illuminates an area and allows the area to be viewed at the same time (used in IVF and GIFT)
   7. **Amniocentesis** – the procedure of collecting a sample of fluid and fetal cells from the aminotic sac for the purpose of identifying potential health problems of the fetus
   8. **Chorion villus biopsy** – the procedure of collecting a sample of cells from the chorion (same genetic material as the fetus) for the purpose of identifying potential health problems of the fetus)
   9. Surrogate Motherhood – the employment of a woman to serve as a substitute mother for the development of the embryo that has been created either through AI or IVF technology
   10. Neonatal Incubator – a chamber that serves as an artificial womb; regulates temperature, humidity and air circulation; provides for nasal tube or intravenous feeding attachments
4. **Future Developments in Reproductive Biotechnology**
   1. Contraception by implanting small tubes that release hormones gradually over 5 years
   2. Contraception by immunizing a woman against pregnancy – the development of antibodies that would inactivate human chorionic gonadotropin (HCG) and thereby preventing it from signally the brain that implantation occurred
   3. Selection of the sex of the offspring – separation of X and Y-bearing sperm; identification of sex of an embryo in conjunction with IVF and embryo transfer;
   4. Genetic evaluation, selection and therapy