1. Define the term and describe the main events of the ovarian cycle
Length- average 28 days
At birth the ovaries contain about 400,000 immature eggs, follicle cells surround the immature ova (primary oocyte) forming a primary follicle.

At puberty
- Follicles begin to develop
- The cells forming the wall begin to enlarge and divide
- Secretions of these cells create a fluid-filled space that forces the ova to the edge of the follicle (secondary follicle)
- Several secondary follicles may commence development, but only one completes development
- The follicle continues to enlarge and move towards the surface of the ovary, it produces a bulge (mature follicle)
- Follicle ruptures forcing the secondary oocyte out of the ovary (ovulation)
- The remaining follicle becomes a corpus luteum

No fertilisation- The corpus luteum degenerates into a (corpus albicans), which disappears
- The ovarian cycle begins again

Fertilisation
- If fertilisation occurs the corpus luteum continues to develop and the ovarian cycles cease.
- After the third month of pregnancy the corpus luteum begins to degenerate
- Ovarian cycles resume after breastfeeding has ceased

<table>
<thead>
<tr>
<th>Term</th>
<th>Define</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary follicle</td>
<td>an immature ovarian follicle consisting of an immature ovum and the few cells surrounding it.</td>
</tr>
<tr>
<td>Secondary follicle</td>
<td>a maturing ovarian follicle consisting of an oocyte surrounded by two or more layers of cells.</td>
</tr>
<tr>
<td>Mature (graafian) follicle</td>
<td>a small sac, embedded in the ovary, that encloses an ovum, that ruptures during ovulation to release the secondary oocyte</td>
</tr>
<tr>
<td>Corpus luteum</td>
<td>The remaining tissue with forms when the follicle releases the ovum. Produces progesterone which maintains the endometrium until the placenta fully develops</td>
</tr>
<tr>
<td>Corpus albicans</td>
<td>Fibrous scar tissue which forms when the corpus luteum begins to degenerate</td>
</tr>
</tbody>
</table>

2. Define and describe the main events of the menstrual cycle
Length- 28 days

<table>
<thead>
<tr>
<th>Days</th>
<th>Stage</th>
<th>What occurs during this phase?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4</td>
<td>Mensturation</td>
<td>Shedding of the endometrium</td>
</tr>
</tbody>
</table>
3. List the hormones involved in the ovarian and menstrual cycles, describe their effects and state the target organ for each hormone

<table>
<thead>
<tr>
<th>Days</th>
<th>Stage</th>
<th>What occurs during this phase?</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-12</td>
<td>Pre-ovulation</td>
<td>Rebuilding of the endometrium in preparation for the implantation of the blastocyst.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Thickens, becomes softer, more vascular (filled with blood), develops mucus secreting glands</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Follicle developing</td>
</tr>
<tr>
<td>13-15</td>
<td>Ovulation</td>
<td>Mature follicle ruptures, releasing the secondary oocyte</td>
</tr>
<tr>
<td>16-20</td>
<td>Secretory</td>
<td>Watery glyco-gen rich mucus made by the endometrium, cervix and fallopian tubes, carbohydrate</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(provides some nutrients).</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Movement and breakdown of unfertilised ova</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Development of corpus luteum</td>
</tr>
<tr>
<td>21-28</td>
<td>Premenstruation</td>
<td>Degeneration of corpus luteum, endometrium</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Effect</th>
<th>Target organ</th>
<th>Released from</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hormones</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemical messengers released into the blood by endocrine glands and trade to target organs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FSH- Follicle stimulating Hormone</td>
<td>Follicles of ovaries</td>
<td>Pituitary gland</td>
</tr>
<tr>
<td>Causes the final development and maturing of the follicle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assists in the formation of the corpus luteum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LH- Luteinising hormone</td>
<td>Cells of the ovaries</td>
<td>Pituitary gland</td>
</tr>
<tr>
<td>Stimulates the secretion of oestrogen and progesterone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triggers ovulation and the development of the corpus luteum</td>
<td>Ovary</td>
<td></td>
</tr>
<tr>
<td>Oestrogen</td>
<td>Ovary</td>
<td>Secreted by ovarian follicle during the first 12 days of the ovarian cycle</td>
</tr>
</tbody>
</table>
4. Distinguish between the terms menarche, menstruation and menopause

Menarche- The first time of menstruation
Menstruation- Discharge of the endometrial lining of the uterus, which occurs on a monthly basis
Menopause- The time of life when menstrual cycles cease

5. Describe how hormones influence the production of sperm in males

<table>
<thead>
<tr>
<th>Effect</th>
<th>Target organ</th>
<th>Released from</th>
</tr>
</thead>
<tbody>
<tr>
<td>Progesterone</td>
<td>Maintenance of endometrium, when an egg is fertilised</td>
<td>Uterus</td>
</tr>
<tr>
<td></td>
<td>Development and maintenance of placenta</td>
<td>Placenta</td>
</tr>
<tr>
<td></td>
<td>High conc prevents LH being produced. ie. stops ovulation</td>
<td>Ovary</td>
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<tr>
<td>Progesterone</td>
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</tbody>
</table>

Hormones: Chemical messengers released into the blood by endocrine glands and trade to target organs

FSH- Follicle stimulating Hormone
Stimulates the production of sperm. Spermogenesis

LH- Luteinising hormone
Stimulates secretion of testosterone

Testosterone
Development/Maintenance of male reproductive system
Development of secondary sexual characteristics, Sex drive
Development of immature sperm cells
6. Describe the process of fertilisation.

For fertilisation to occur, male sperm must come into contact with an ova, produced by a female, this is done by sexual intercourse.

<table>
<thead>
<tr>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>The erectile tissue of the penis fills with blood when sexually aroused, the penis becomes erect.</td>
<td>When a female is sexually stimulated erectile tissue reduces the size of the vaginal opening, which can lead to further stimulation of the penis.</td>
</tr>
<tr>
<td>Rhythmic contractions of the epididymis propel the contents of the seminal vesicle, prostate gland and coopers gland into the urethra and out of the body (ejaculation).</td>
<td>This stimulates secretions of mucus from glands surrounding the cervix to lubricate the vagina.</td>
</tr>
<tr>
<td>The man also experiences and orgasm, which includes rapid hearted, increased blood pressure, and intently pleasurable sensations.</td>
<td>Females may also experience an orgasm, but is does not involve ejaculation.</td>
</tr>
</tbody>
</table>

When a male ejaculates the sperm are released into the vagina (insemination), around 1tsp, containing 250-300 million sperm.

The sperm travel through the cervix and uterus up to the fallopian tubes. Only a few thousand sperm reach the uterine tubes (High sperm mortality).

Fertilisation generally occurs in the fallopian tubes when the ova is 1/3 of the way down.

The mature ova is surrounded by a layer of follicle cells (corona radiata), acid holds these cells together. An enzyme contained on the head of a sperm breaks down this acid, thousands of sperm are required to break it down.

One single sperm merges with the ova, stimulating the formation of a fertilisation membrane, preventing the entrance of any more sperm.

Once the sperm has entered, the tail is absorbed, the head moves through the cytoplasm (as a male pronucleus)

The entrance of the sperm stimulates the secondary oocyte to complete the second meiotic division.

The nucleus of the ova develops into a pronucleus and fuses with the male pronucleus, forming a single nucleus with a diploid number of chromosomes.

The fertilised egg is called a zygote.

7. Describe the features of the male and female reproductive systems that facilitate fertilisation.

Erectile tissue in male- Fills with blood, the penis becomes erect and can be inserted into the vagina
Erectile tissue in female- Fills with blood, makes the Vagina/cervix contract, the rhythmic contractions assist in guiding sperm up to the fallopian tubes.

Secretarial glands in male- Seminal vesicle: Secretes a sugar rich fluid, which provides energy for the sperm (main component of semen).  
    Prostate gland: Secretes an alkaline fluid that helps to activate sperm  
    Cowpers gland: Secretes a fluid that becomes part of the semen

Secretarial glands of the female- secret mucus to lubricate the vagina, for the insertion of the penis.

Muscular contractions- Muscular contractions of the uterus assist in transporting the sperm through the reproductive track.

8. Define the term zygote
The fertilised ovum, which results from the fusion of a sperm and an ovum.

9. Describe the events that take place from the formation of the zygote to the blastocyst stage when implantation occurs

Fertilisation occurs in the upper fallopian tube, the 2 haploid gametes merge to form a diploid zygote.
Divides by mitosis (cleavage) into 2 cells, 4, 8
Becomes a morula a non specialised group of cells
Travels to the uterus via the fallopian tube
5 Days after fertilisation it becomes a blastocyst, a hollow ball of about 100 cells.
  - The trophoblast (outer cells) becomes the placenta
  - The inner cell mass becomes the embryo or collected as embryonic stem cells
The blastocyst remains in the cavity of the uterus for 2-3 days before implanting into the endometrium
The blastocyst gains nourishment from the endometrium.
High levels of progesterone prevents endometrium shedding.

Pregnancy- The period between conception and birth
  - 265 days (embryonic)
  - 280 days (clinical) from last day of period

3 trimesters, each 3 months
Embryo > 0-8wks
Foetus > 8wks - Birth

10. Describe the role of HCG (human chorionic gonadotrophin) in early pregnancy
A hormone that is only produced during pregnancy
  - Maintains corpus luteum
  - Prompts the corpus luteum to continue to secrete progesterone and oestrogen, to maintain the endometrium
  - The Chorion, an embryonic membrane developed from trophoblast continues hormonal stimuli and later forms the placenta
  - Is detected on pregnancy test sticks to determine if pregnant

11. Define the term differentiation
The cells that make up the inner mass of the blastocyst are stem cells.
  - They are not specialised for any particular role
  - They are capable of repeated division by mitosis
  - Given the right conditions they can differentiate into specialised cells

The process in which unspecialised cells develop the characteristics and functions of particular cell types, ie. blood, muscle, nerve, bone.
They develop into all of the 200 or more types of cells that make up the mature body

12. Distinguish between totipotent, pluripotent and multipotent stem cells
Different types of stem cells exist.
Totipotent- Cells which can become any kind of cell in the body, even an embryo. They zygote and the cells which make up the morula are totipotent stem cells.

During the first few hours of fertilisation the cell divides into multiple Totipotent cells which have the potential to develop into individual embryos (identical twins), about 5 days after fertilisation they specialise and form blastocysts

Pluripotent- Cells which can become almost any kind of cell in the body. Cells which make up the ‘inner cell mass’ in a blastocyst are pluripotent stem cells.

Multipotent- Cells which can become only a limited range of cell types. Cord stem cells from the umbilical cord and adult stem cells are multipotent stem cells.

Eg. Blood cells - White, Red blood cells, platelets

13. Identify some tissues and structures that develop from the primary germ layers

During the 2nd week after fertilisation, 3 layers of cells form, which develop into the organs of the body.

Ectoderm- The outer layer of the developing embryo which gives rise to the skin, nails, sense organs, nervous system.

Mesoderm- The middle layer of the developing embryo which gives rise to the skeletal system, muscles, gonads, blood and kidneys

Endoderm- The inner layer of the developing embryo which gives rise to the digestive track, respiratory tract, bladder, liver and pancreas

14. Describe the role and development of the amnion, chorion, placenta

During the early development of the embryo 4 embryonic membranes form, they lie outside the embryo. They protect and nourish the embryo.

8 days after fertilisation the amnion forms and surrounds the membrane, it secretes amniotic fluid which protects the embryo/foetus as a shock absorber
- Maintain a constant temperature
- Allows the foetus to move freely before birth
- Just before birth it bursts

Chorion- The outer embryonic membrane
- Surrounds all the other membranes
- The outer fuses to the endometrium forming the placenta
- The inner fuses to the
The placenta is fully formed about 8-12 wks
It supplies nutrients and removes waste from the foetus. It is a combination of maternal and foetus tissues from the endometrium and chorion.

15. Describe the structure and function of the placenta

From the chorion (foetus) finger like projections called Chorionic villi grow into the endometrium, surrounded by maternal blood, so that the foetus can be supplied with nutrients and remove waste.
Maternal and foetal blood do not mix, as they may be different blood types.

The Placenta's role
It is an endocrine gland and produces oestrogen and progesterone
Excretory- removes urea from foetus blood, into maternal blood
Immune- Transfers antibodies from mother to the foetus
Nutritional- Gives the foetus nutrients, glucose, fatty acids, amino acids
Stores- minerals, vitamins for later use
Respiratory- provides O2, removes CO2

Attached to the foetus via the umbilical cord. The umbilical cord contains 1 umbilical vein and 2 umbilical arteries on average.

16. Maintaining a healthy pregnancy
Body functions slow down,
- allow more nutrients to be obtained from the food
- remains in the blood for longer
- Allowing more to be diffused across the placenta for the foetus.

= less movement in the alimentary canal = more water is absorbed = faeces can become dry and possibly painful to defecate (constipation)

- Higher concentration of nutrients in the blood, therefore more tend to be filtered out by the kidneys. A well balanced diet is necessary to compensate for this loss.

Increased blood volume
- Increased heart rate
- Increases by around 40%

Well balanced diet
- Increase of 850KJ per day
- Increased protein

Iron- Compensate for increased blood volume
Iodine- Needed for the production of thyroid, which is important for growth and development
Folate (vitamin B)- Needed for growth and development, helps to prevent birth defects
Zinc- A component of various enzymes, important for the rapid cell growth
Vitamin D- Gives strength to bones
Vitamin C- Important for the formation of collagen, important in blood vessels, larger blood volume
Calcium- Vital for bones and teeth

Exercise
- Maintain exercise program
- Walk regally
- Stamina for labour

Progesterone injections- Injected to prevent the premature shedding of the endometrial lining and prevent premature labour

Congenital disorders
Diseases or defects present at birth, may be inherited or spontaneous chromosomal mutation or environmental factors.

Teratogenic agent- Causes physical defects in the foetus, inc. hormones, antibiotics, LSD, thyroid drugs, marijuana

Infections: Rubella- Viral infection, highly infectious, can cause deafness, blind or heart malformations
    Risk of damage- 61% in 4th month, 10% towards end of pregnancy
Maternal diet: Listeria, mild illness caused by food infected by the bacterium, can cause stillbirth or miscarriage

Alcohol: Foetal alcohol syndrome, lower birth weight, slow growth, small head, irregularities of the face, narrow eye slits, sunken nasal bridge, defects of heart and other organs, malformed arms and legs, mental retardation, behavioural problems, hyperactivity, extreme nervousness and poor attention span

Smoking: Low birth weight, increased risk of abortion, gastrointestinal problems, respiratory problems, bronchitis, pneumonia, SIDS (sudden infant death syndrome).

Chemicals: Thalidomide- originally used for sleeping pills, prevent morning sickness. Linked to limb malformations. Acts on the embryo between days 28-42, when limbs are forming. Affects arms more than legs as arms are 1st to develop.

17. Diagnosis of foetal health
Ultrasound: Inaudible, high frequency sound waves, which reflect off foetal tissue (bones), reflected sounds (echoes) produce a screen image

Chromosome analysis: Karyotype, photo display of chromosomes
- Examined to detect defective, missing or additional chromosomes
Methods: Amniocentesis (wks 16-20): removal of 10-20ml of amnionic fluid, risk of infection, miscarriage, damage to baby
  - Chorionic Villus sampling (wks 9-19): obtains specimen of foetal cells from chorion
    - quick, but risk of miscarriage

Foetal blood sampling (wks 18-22)
- Quick
- Percutaneous umbilical sampling with fine needle
- Can be examined for down syndrome, blood disorders, intrauterine infection, growth retardation

18. Treatments of infertility

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
</table>
| Artificial insemination by donor (AID)    | When: If sperm is unable to fertilise  
  What: Insemination of sperm from a donor male at time of ovulation  
  Risks: Transmission of disease  
  Effectiveness: 70-80% |
| In-vitro fertilisation (IVF)              | What: sperm are added to a glass dish with an ova, to fertilise the ovum. Then implanted into the uterus  
  When: Obstruction of fallopian tube |
| Gamete intra-fallopian transfer (GIFT)    | Sperm and eggs are mixed together, mixture injected into fallopian tubes, the fertilised eggs then implant and continue normal pregnancy |
19. Stages of labour

Parturition- The process in which the foetus is expelled from the mother's body at the end of gestation

Before labour
Hormone changes occur
- Causes ligaments of the pelvis to soften
- Increases response of uterus to stimuli and strengthen contraction of its muscles
Cervix softens
Foetus head at mothers pelvis

Stage 1 Cervical dilation
Waves of downwards muscular contractions shorten, widen and thin the cervix
Foetal head pushes on the cervix widening it further
Muscle fibres of uterus shorten

Early labour: 0-4cm, days to hours
Part 2: 4-8cm, 4-8 hours
Part 3: 10cm, 15mins-1.5 hours

Stage 2 Expulsion
- If not already broken amnion breaks
- Stretches vagina, head of baby
- Abdominal muscles contract and push foetus through vagina
- Tissues between vagina and anus stretch (can tear)
- Head crowns

Stage 3 Birth of the placenta
- Uterus continues to expel all membranes, placenta, umbilical cord
- Placenta blood vessels constrict
- Uterine contractions squeeze uterine vessels shut, blood clots form
- High risk of infection

20. Changes after birth
Born 50cm long, 3.4 kg
Before birth- Totally dependent on mother, O2, nutrients, waste removal, protection
After birth- Totally self supporting, reflects

Changes in mother
Puerperium 8wks after birth
- Uterus continues to contract

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intra-cytoplasmic sperm injection (ICSI)</td>
<td>What: Single sperm implanted into single egg, and implanted When: if sperm count is low Effectiveness: 20-30%</td>
</tr>
<tr>
<td>Surrogacy</td>
<td>What: Embryo implanted into the uterus of a different women who carries the baby for nine months and then gives it to the genetic parents</td>
</tr>
</tbody>
</table>
- Breastfeeding releases oxytocin which stimulates contractions
- Abdominal swelling shrinks, uterus returns to pre-pregnant state
- Discharge 3-6wks after birth
- Blood volume returns to normal
- Pulse rate decreases

Emotional
- 2-3 days excited
- day 3 onwards, demands of baby = baby blues

Reproductive system
- Menstruation begins again when breastfeeding ceases

**Changes in foetal circulatory system**

**Before birth**

**Ductus venosus (liver bypass)**
- Directly to vena cava
- Mother's liver serves needs of the baby

**Ductus arteriosus (lung bypass)**
- Lungs are deflate, resistance to blood flow

**Foramen Ovale (hole in the heart)**
- Highly oxygenated blood can travel straight to the foetal tissue

**Blood pathways**
- Normal pathway, through lungs (little blood flow as resistance from deflated lungs)
- Blood from right ventricle bypasses the lungs, ductus arteriosus into aorta
- Enters right atrium, to left atrium through Foramen ovale, quick way to distribute O2

**After birth**
- Lungs and liver must function as soon as born
- Shock of birth triggers baby to breath
- Lungs expand, no resistance
- Blood flow through ductus arteriosus and ductus venous decreases, becomes fibrous tissue
- Blood flows into left atrium from lungs flab of foramen ovale closes because of pressure
- 45bpm

### 21. Contraception

<table>
<thead>
<tr>
<th>Form</th>
<th>How it works</th>
<th>Effectiveness</th>
<th>Cost</th>
<th>Side affects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural methods</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Abstinence</td>
<td>Refrain from any sex</td>
<td>100%</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Coitus interruptus (withdrawal)</td>
<td>Withdrawal before ejaculation</td>
<td>Unreliable</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Calendar (rhythm)</td>
<td>Abstinence during fertile periods</td>
<td>Unreliable</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Basal body temperature</td>
<td>Ovulation- sudden drop in temperature</td>
<td>Unreliable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Symbothermal</td>
<td>Combination of natural methods</td>
<td>Unreliable</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>Artificial methods</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barriers- Male condom</td>
<td>Fitted over penis to catch sperm</td>
<td>98%</td>
<td>Cheap</td>
<td>May cause irritation if allergic</td>
</tr>
<tr>
<td>Female condom</td>
<td>Blocks sperm entering uterus</td>
<td>95%</td>
<td>Cheap</td>
<td></td>
</tr>
<tr>
<td>Diaphragm/cap</td>
<td>Thin rubber cap fitted over top of vagina, used with spermicide</td>
<td>82-86%</td>
<td>Relatively cheap</td>
<td>Must be left in for 6 hours prior to sex</td>
</tr>
<tr>
<td>IUD</td>
<td>Effects sperm movement throughout uterus, disrupts endometrium</td>
<td>99%</td>
<td></td>
<td>Heavier, longer, painful periods</td>
</tr>
<tr>
<td>Chemicals</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spermicide</td>
<td>Used with condom, diaphragm, contents immobilises sperm, bubbles of CO2 block their path</td>
<td>Unreliable when used alone</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hormonal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oral contraceptive</td>
<td>Oestrogen and progesterone prevent the release of an ova, cervix blocked by mucus, endometrium altered</td>
<td>Reliable when used correctly</td>
<td></td>
<td>Nausea, tender breasts, weight gain</td>
</tr>
<tr>
<td>Form</td>
<td>How it works</td>
<td>Effectiveness</td>
<td>Cost</td>
<td>Side effects</td>
</tr>
<tr>
<td>-----------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>---------------</td>
<td>-------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>Injectables/Implants</td>
<td>Prevent the release of an ova, cervix blocked by mucus, endometrium altered</td>
<td>94-99.8%</td>
<td></td>
<td>Headaches, tiredness, mood swings, weight gain</td>
</tr>
<tr>
<td>Morning after pill</td>
<td>Progesterone delays ovulation, effects egg and sperm movement</td>
<td></td>
<td></td>
<td>Nausea, tender breasts, headaches</td>
</tr>
<tr>
<td>Surgical</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tubal ligation</td>
<td>Fallopian tubes cut and clipped</td>
<td>99%</td>
<td>Permanent</td>
<td></td>
</tr>
<tr>
<td>Vasectomy</td>
<td>Removal of a piece of the vas deferent</td>
<td>99%</td>
<td>Permanent</td>
<td></td>
</tr>
</tbody>
</table>

Ethical- Against the beliefs of the church

**Sexually transmitted disease**
Prevention: Safe sex, use of condom, dam, abstinence
Treatment: Antibiotics, cream, contact tracing
If left untreated: Infertility caused by Pelvic Inflammatory disease, can spread
Common symptoms: Flue like symptoms, pain while urinating, unusual discharge, rash, lumps, sore genital areas, pain, swelling of testicles