**fertility**

the essential guide

The West Australian

ADVERTISING FEATURE

Published September 26, 2013

1. Define what constitutes infertility and state what Australia’s infertility rate is. (2 mark)

* Infertility is the inability to conceive within a year of trying (1)
* 1 in 6 couples suffer infertility (1)

2. What is considered the ‘normal’ time to conceive? (1 mark)

* 1 year of trying (1)

3. Assisted conception are a group of medical treatments aimed at increasing the chance of pregnancy each moth through a procedural intervention with sperm, eggs or embryos spending some time outside the body. Briefly explain the following techniques. (8 marks)

* IUI
* IVF
* ICSI
* PGD

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| IUI (intrauterine insemination) (1)   * Assisted insemination into the uterus (placing sperm into the uterus)(1) | IVF (Invitro fertilization) (1)   * Eggs fertilised in a laboratory (1/2) * Resulting embryo transferred into the mother (1/2) |
| ICSI (intracytoplasmic sperm injection) (1)   * Microinjection of one or more sperm is injected into the egg. (1) | PGD (Pre-implantation genetic diagnosis) (1)   * Genetic diagnosis of an IVF embryo before embryo transfer (1/2) * Removes one or two cells of the embryo (1/2) |

|  |  |
| --- | --- |
| FISH (Fluroescent In-Situ Hybridisation) (1) | CGH (Comparative Genomic Hybridisation)(1) |
| * small subset of chromosomes (5-8) * screen on day 3 embryo * results less precise * less embryo survival * more technical limitations * more impact on embryo survival * more invasive to the embryo | * targets all chromosomes * performed on blastocysts (day 5–6) * results more precise * better embryo survival * fewer technical limitations * due to greater cell number, sampling has minimal impact on embryo survival * less invasive to the embryo |

4. Construct a table of the differences between FISH and CGH. (4 marks)

5. Vasectomy and tubal ligation are no longer considered permanent sterilisation procedures. Discuss what this statement means and give the % success and pregnancy rate for both. Include in your answer why it is the age of the woman that is the most important influence on the chance of pregnancy. (4 marks)

* it is possible and very successful (1)
* Tubal ligation - more than 99% of cases (1/2) / pregnancy 70-90% (1/2)
* Vasectomy - more than 95% achieve presence of sperm (1/2) / 50-80% have a baby (1/2)
* The womans age is the most important influence (1)

6. Make a list of all the possible reasons and contributing factors of male infertility. (5 marks)

* DNA fragmentation (separation or breaking of DNA strands)
* Low morphology (normal forms)
* Low motility
* Low sperm count
* Sperm health
* Nutritional status (especially antioxidants)
* Heavy metal toxicity
* Toxin exposure
* Hormonal factors
* Poor lifestyle choices
* Prostate conditions
* Hormone dysfunction (low testosterone)
* Libido issues
* Stress related concerns

(Any 10 of the above ½ mark each)

7. Describe what SCSA testing is and the effect a poor result would have on fertilisation, implantation and pregnancy. (5 marks)

* SCSA (Sperm Chromatin Structure Assay) (1)
* Testing to measure the level of DNA fragmentation (an essential marker of sperm health) (1)

A poor result would indicate

* An inability of the sperm to initiate fertilisation (1)
* Embryo development ceasing before implantation (1)
* Miscarriage in the first trimester (1)

8. List some of the issues associated with dealing with infertility? (2 marks)

* Fear
* Anxiety
* Loss of control
* Self-esteem
* Relationship tension
* Grief

Other -

* Hormones involved in treatment can also impact on a woman’s
* Couple can experience tension an distress

(any 4 of the above ½ mark each)

9. Aneuploidy is a major factor in the failure to establish or maintain a pregnancy.

i What is aneuploidy? (1 mark)

* The wrong numbers of chromosomes / abnormal number of chromosomes / extra or missing chromosomes

ii What does the new technology 24sure enable scientists to do? (1 mark)

* Screen for aneuploidy in developing embryos

iii List 3 groups of women who would most benefit from this test. (3 marks)

* Ages more than 35yrs
* History of miscarriage
* Had 3 or more IVF cycles without success

iv How long does 24sure take to do this and why is this an advantage? (2 marks)

* 20 hours (1) / does not impact on the scheduling of an embryo transfer procedure in a fresh ICG cycle (1)

10. Both anonymous and known donations are permitted for sperm, eggs and embryos as alternative to IVF in the WA.

i Who can access donor insemination? (3 marks)

* couples with male fertility issues (1)
* single women (1)
* lesbian couples (1)

ii What is donor insemination? (2 marks)

* a medical procedure carried out by inserting semen collected from a donor (1) into the vagina of a woman when she is ovulating (1)

iii What screens are carried out on donor sperm and eggs? (1 mark)

* Genetic and infectious diseases (1)

iv What is one way in which the recipient of donated eggs may differ from the recipient of donor sperm? And why? (2 marks)

* The recipient of donor eggs may be significantly older (1) / the use of eggs from younger women has been found to significantly increase the likelihood that these older women will have a child (1)

v A person born through donor-assisted conception, who reaches the age of 16 on or after December 1, 2020, has a legal right of access to identifying information about their donor (with approve counseling before this information is provided). What about the people who were donor conceived before December 1 2004? Also read advertisement “Have you been involved in donor-assisted conception?” p13 (2 marks)

* There is no automatic access to identifying information (1)
* They are encouraged to join the Department of Health’s Voluntary Register (1) so that it might be possible to access donor information

11. Explain what a surrogacy arrangement is and who is eligible. (2 marks)

* Where a woman agrees to carry a child for another person or a couple with the intention that those parents will raise the child (1)
* An eligible person is a woman who is unable to conceive a child due to medical reasons (1/2) or is unable to give birth to a child (1/2)

12. How does “Home 4 Life” differ from foster carers and adoption? (2 marks)

* Provides a child with a single permanent and caring home – for life
* Child is placed with the same foster carer until the child turned 18
* After 3 years of permanent care, a carer may apply to adopt a child from being in care
* Permanent foster carers make a lifelong commitment to look after the child

(any 2 of the above )

13. Answer true or false for the following IVF statements. (10 marks)

T if a male has problems with sperm count, the sperm can be concentrated and placed into the uterus at the appropriate time

F if a woman isn’t ovulating, she can go through a process to produce eggs and have them taken out of her fallopian tube.

T IVF is currently the most commonly practiced treatment for infertile women in Australia

F IVF involves the removal of one egg from the ovary after stimulation

F the resulting embryo is transferred to the womb for implantation within 24 hours

T The egg collection is generally done mid cycle around day 14

T A woman’s own hormones are suppressed when gonadotrophins are taken to stimulate the growth of follicles

T The eggs and sperm are cultured together overnight

F A fine catheter is used to transferred to the fallopian tube

F A blood test is performed every week and at 6-8 weeks an abdominal ultrasound is performed

14 i What is ovulation? (1 mark)

* when a mature egg is released form the ovary, pushed down the fallopian tube and is available to be fertilized (1)

ii What is the ‘fertile window’? (1 mark)

* the days in a woman’s menstrual cycle when pregnancy is possible (1)

iii Work out the day a woman with a 33 day cycle would most likely ovulate and when her fertile window begins. (2 marks)

* 33 – 14 = day 19 (ovulation) (1)
* 33 – (14 + 3) = day 16 (fertile window begins) (1)