

# In vitro fertilization

Test tube baby

{ Egg  
Sperm  
media

## In vitro fertilization

Fertilization outside  
Female body

1 year → Unprotected sex → Not able to conceive  
Female Infertility      Male Infertility

- Menstrual function abnormality

= low FSH, LH & estradiol / prolactin  
Pituitary / Hypothalamus

- PCOD - PCOS

Poly cystic ovarian disease / syndrome

Cysts →

- Uterine tract abnormality

- Thyroid disease → unable to conceive.

Egg → defective      Sperm → defective.

\* Treatment for Infertile couple

\* Hope for Infertility

\* Adoption → Difference of behaviour

\* Treatment risk. Natural <sup>is not</sup> risk free

\* Masturbation.

\* Unmarried couple lady → ???  
right of child.

\* Male → ???  
right of the child.

Poor quality Semen

Sperm are of poor quality

male

✓ Count - low

✓ Sperm motility low

✓ Non motile

✓ Anti sperm Ab.

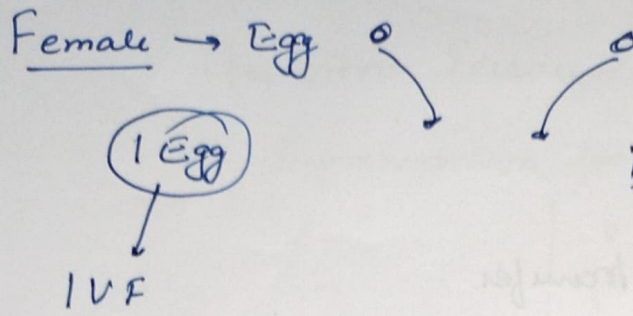
Obstructive

✓ azoospermia

|  
Vas deferens absent

Vasectomy





i) Superovulation  
parenteral  
Gonadotropins

≥ More no. of eggs  
Multiple Oocytes

Superovulation

(1) Spontaneous LH → Prevent  
by suppression of pituitary

leuprolide acetate → GnRH  
↓  
Pituitary Suppression

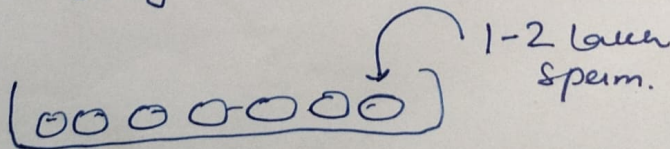
(2) Recombinant FSH  
transvaginal ultrasonography  
Serum Estradiol level.

(3) Lead follicle has matured.  
HCG → Human Chorionic  
Gonadotropin.

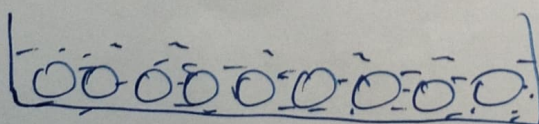
Pituitary → LH → Oocyte mature.

Oocytes are retrieved (10-20)

Oocyte culture media

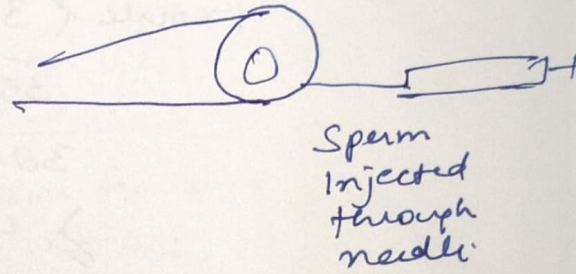


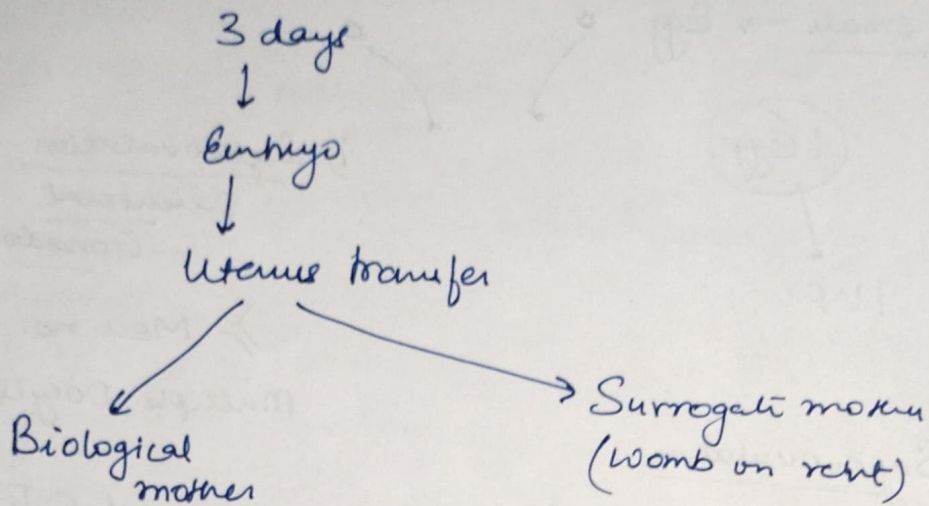
↓ 12-20h



Fertilization < 65%  
defective Gametes

ISCI  
Intra Cytoplasmic  
Sperm Injection





Implantation → 5 days after oocyte retrieval  
Successful

Implantation.

Female < 35y — 1-2 embryos

35-37y — 3 embryos

38-40 — 4 embryos

≥ 40yr. 5 embryos

Progestations → Injection.

- \* Expensive
- " Inconvenient
- " Multiple pregnancy
- " Neurological sequelae
- " Multiple birth defect

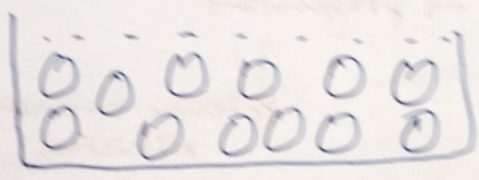


# In vitro Fertilization

Superovulation for retrieving Oocytes

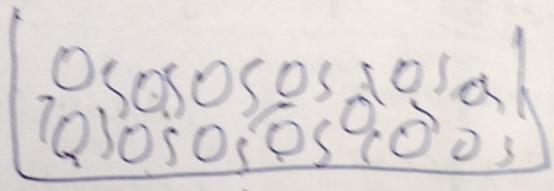
- \* Prevention of LH
- \* Inj of GnRH
- \* Administration of rFSH
- \* HCG for final Oocyte maturation

Oocyte retrieved by  
Ultrasound guided needle aspiration



Sperm Addition  
1L-2L

Derivation of ESCs  
Ethical Issues



12-20 h  
fertilization  
observed.

Incubated  
at 37°C

20 Oocyte  
Fertilization

5-days of Oocyte  
retrieval → transferred  
to mother Uterus.

Bank  
Cryopreservation

Embryonic  
stem cell  
(Inner cell  
mass)  
Pluripotent

PGD  
Pre Implantation  
Genetic Diagnosis

→ Couple is at risk for  
genetic disease  
→

- Karyotype
  - Chromosomal defects
  - Familial defects
- Genetic diagnosis