



# ARTIFICIAL REPRODUCTIVE TECHNOLOGY

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# What are assisted reproductive technologies?

## Techniques involving oocyte retrieval:

- Gamete Intra-Fallopian transfer (GIFT), Peritoneal Oocyte Sperm Transfer (POST)
- Zygote Intra-fallopian Transfer (ZIFT).
- In Vitro Fertilization (IVF)
- Tubal Embryo Transfer (TET)

## Techniques involving sperm retrieval:

- Testicular Sperm Aspiration (TESA)
- Per-cutaneous Epididymal Sperm Aspiration (PESA)
- Microsurgical Epididymal sperm Aspiration (MESA)
- Non-Scalpel Vasal Sperm Aspiration (NSVSA)

## For injection:

- Intra-Cytoplasmic Sperm Injection (ICSI)

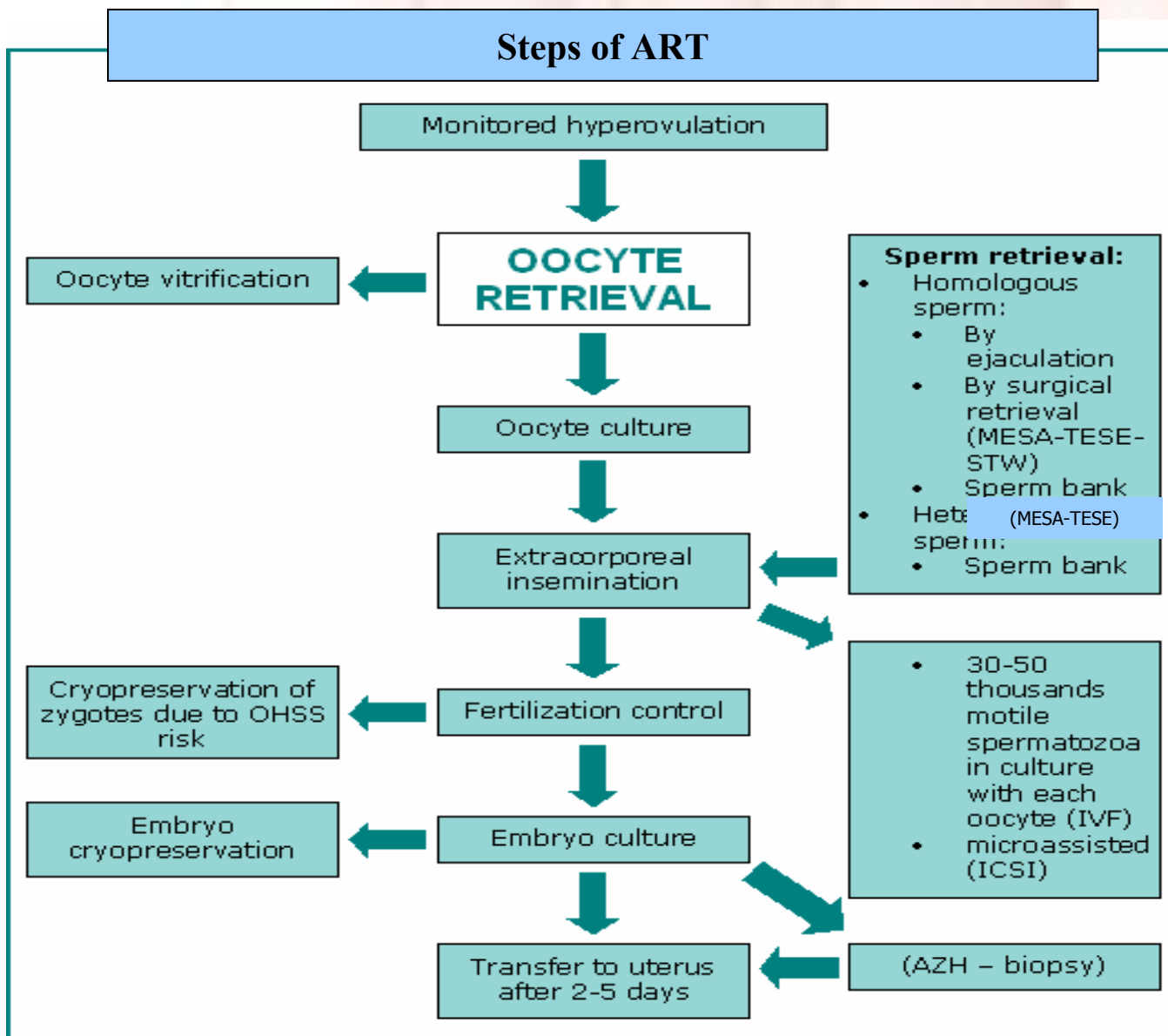
# Who are the candidates of ART ?

- \* Female problems

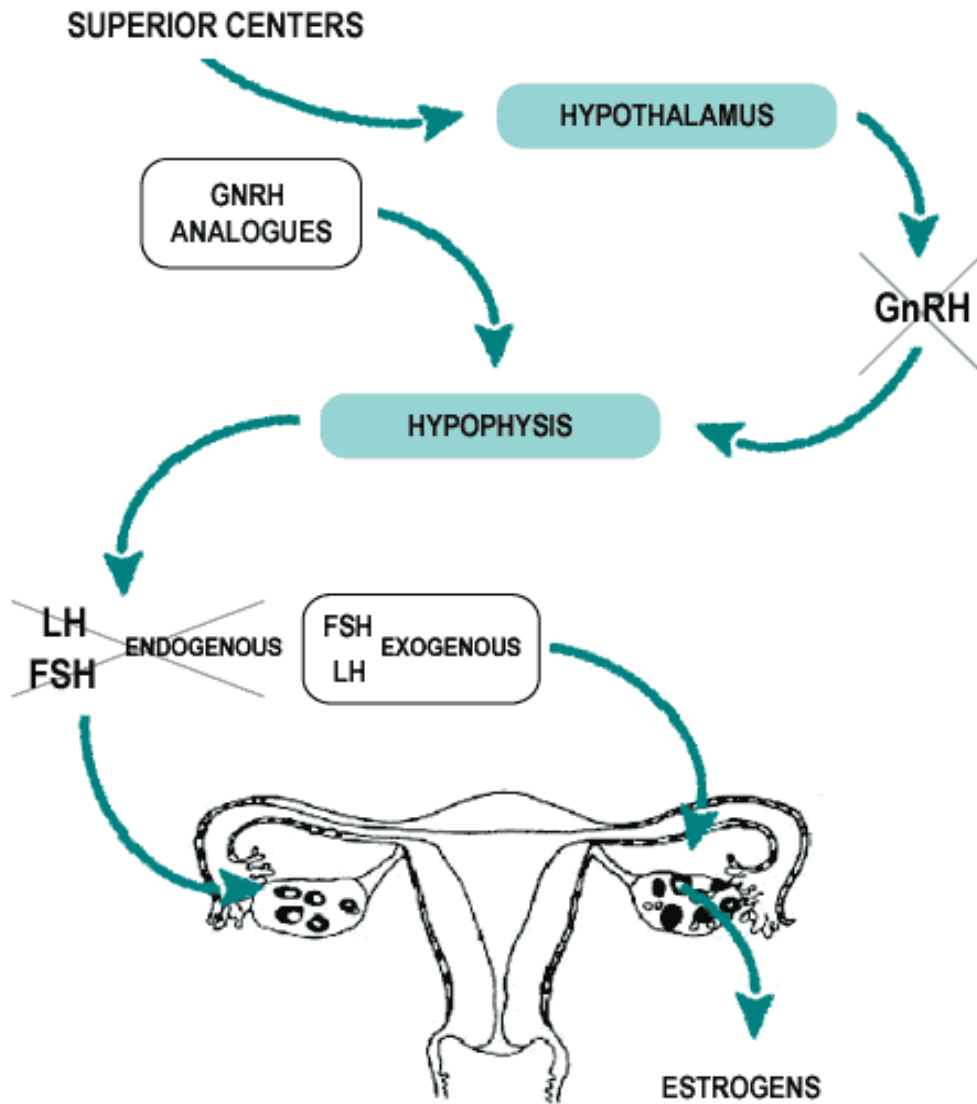
- \* Male problems



# What are the steps of ART ?



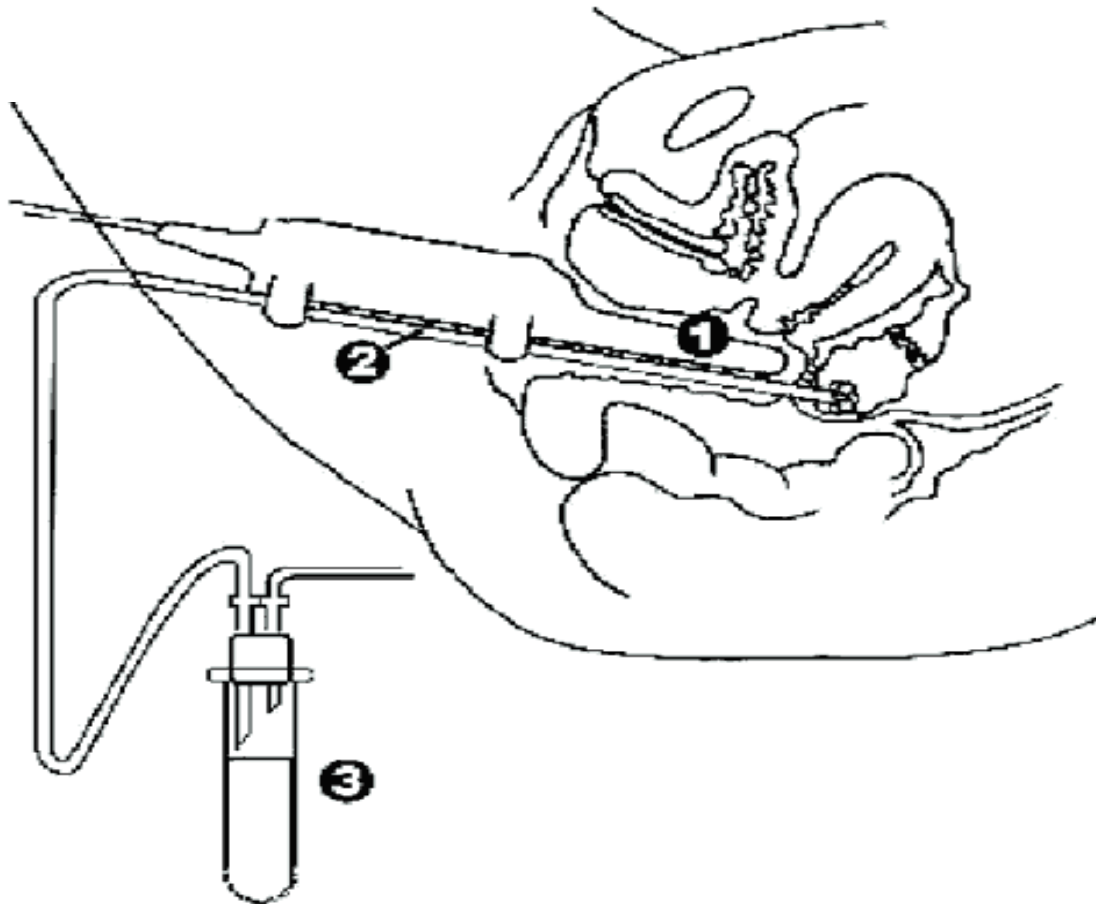
# PATIENT STIMULATION



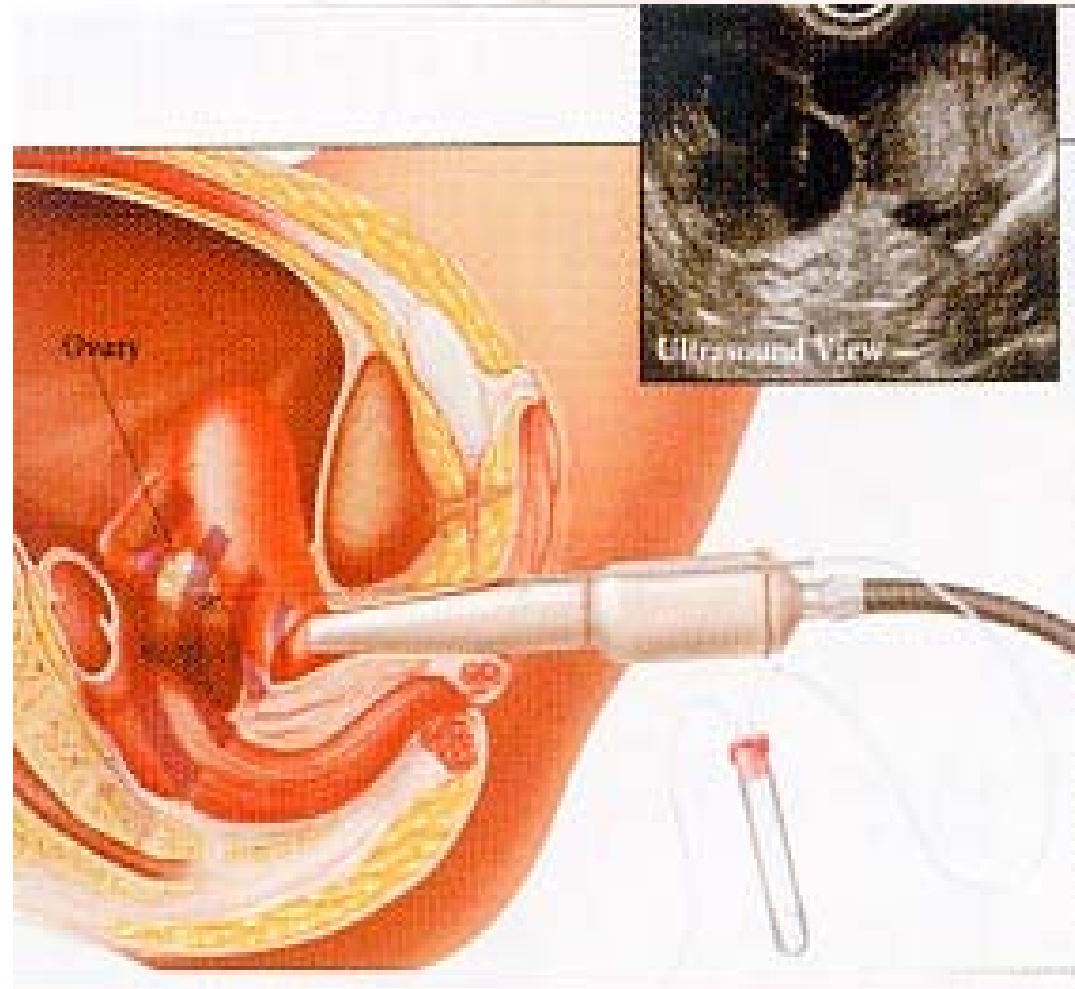
US image of multiple ovarian follicles



## OOCYTE RETRIEVAL



# Oocyte retrieval

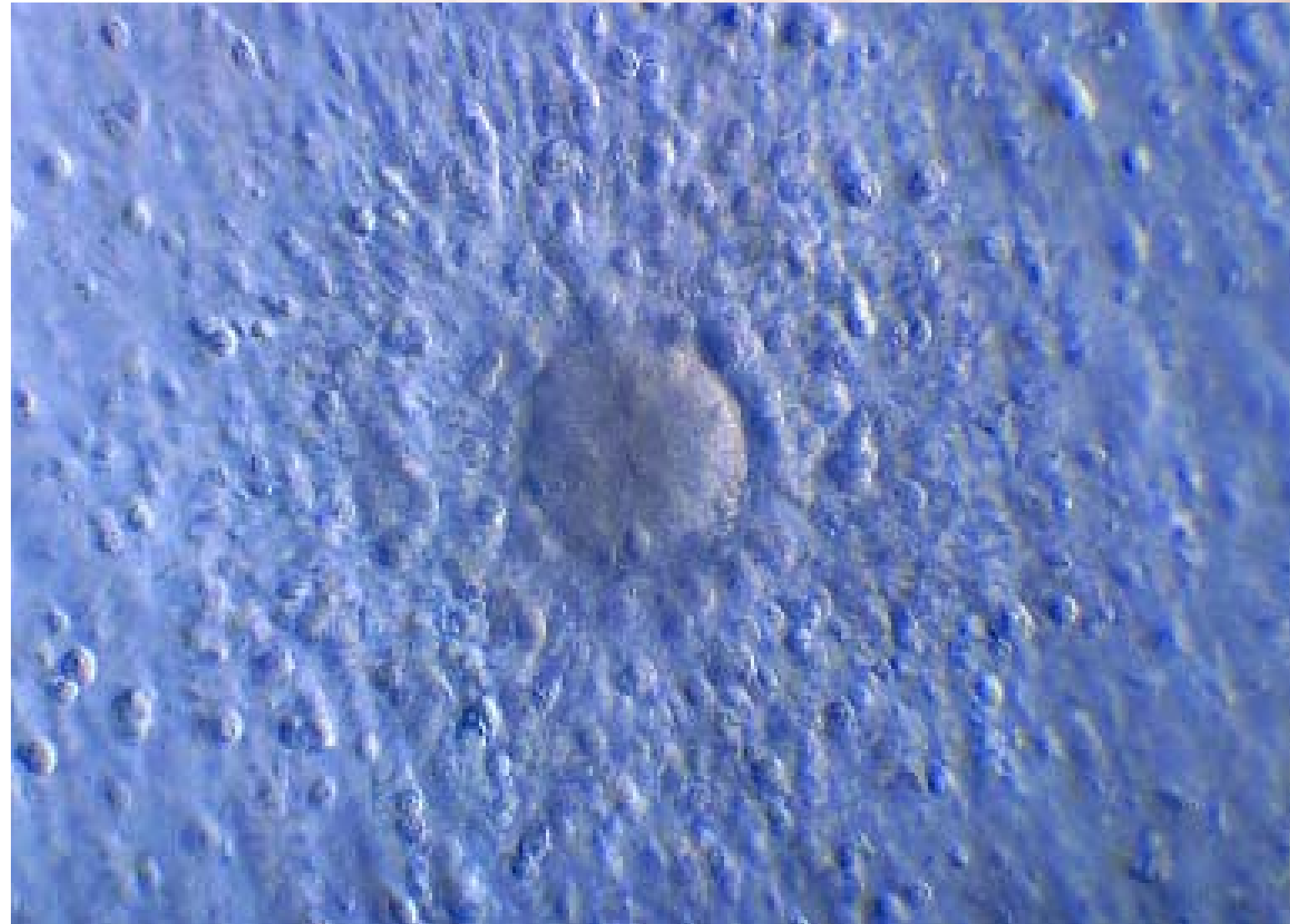




Syringes with cumulus-oocyte complex in follicular fluid



# Cumulus oocyte complex



# Oocyte culture

Oocytes have a higher chance of fertilization if insemination follows retrieval by 4-6 hours



# Extracorporeal insemination

- Sperm retrieval
- Sperm preparation
- Technique of insemination

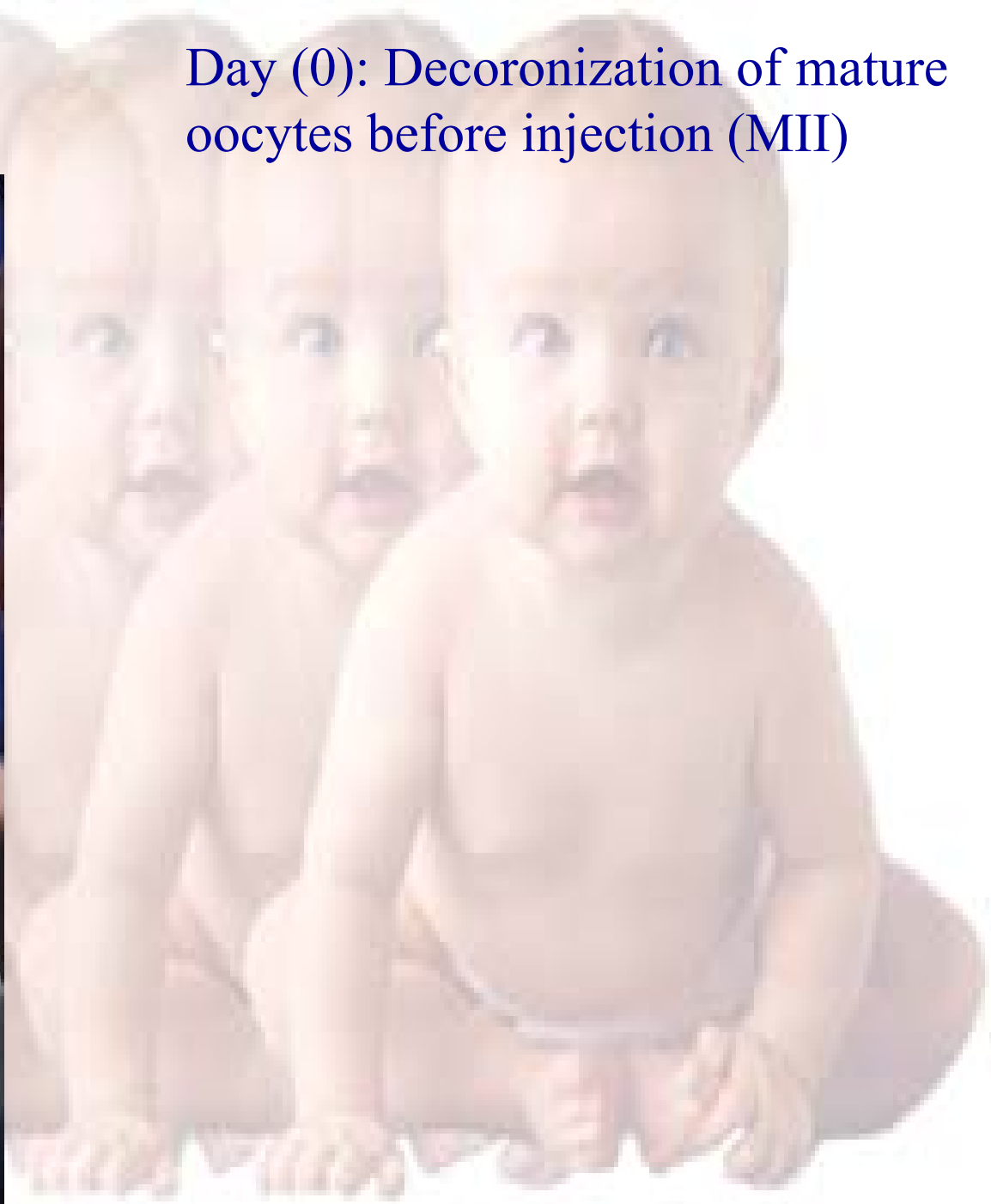


Technician with sperm preparation



# ICSI

Day (0): Decoronation of mature oocytes before injection (MII)



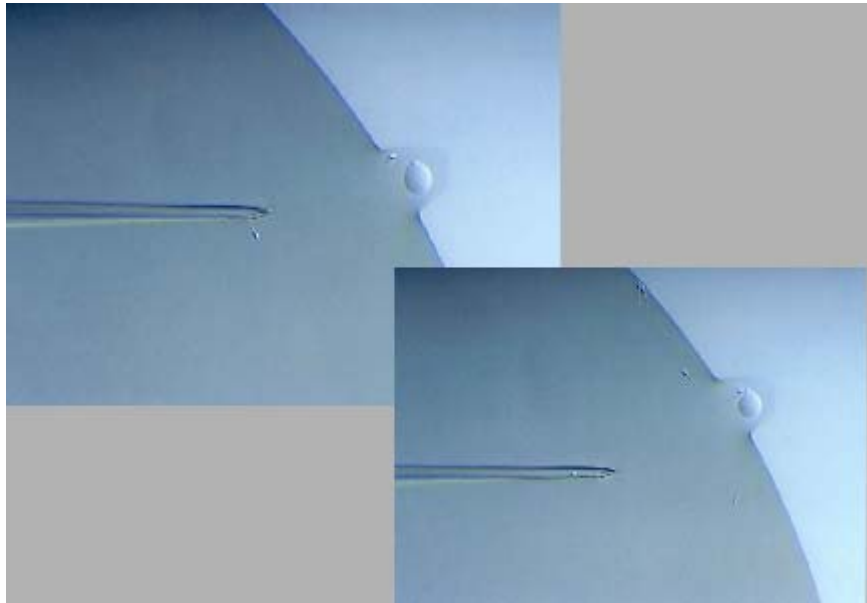
ICSI

Day (0)



# ICSI

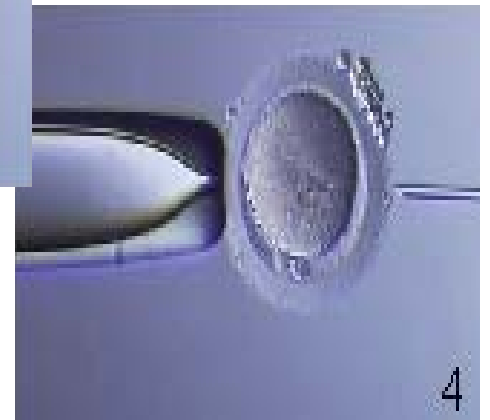
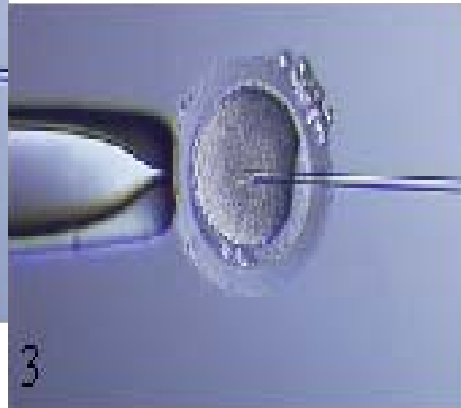
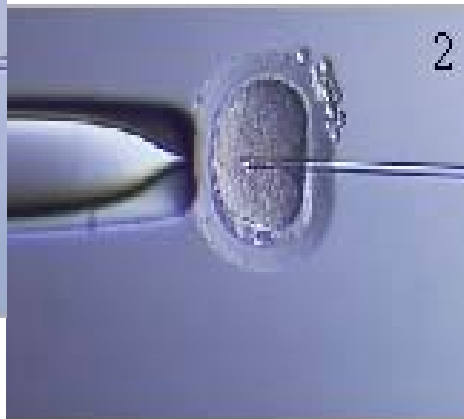
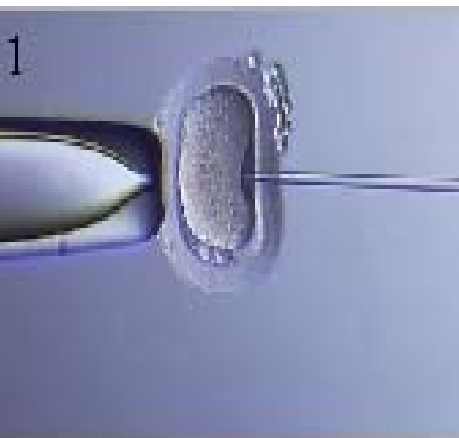
Day (0): Holding of a single sperm with the injection pipette





# Intra-Cytoplasmic Sperm Injection

Day (0)

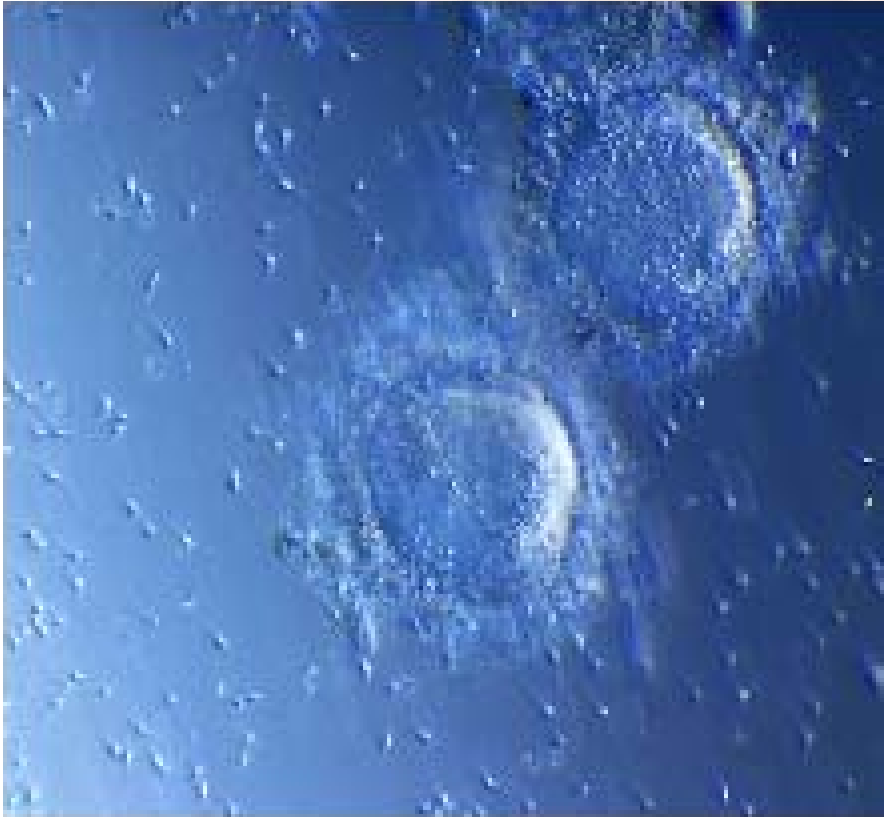


# Fertilization control



# Observation of zygotes

Day (1): Unfertilized oocytes



# Observation of zygote

Day (1): Pronuclear stage embryo

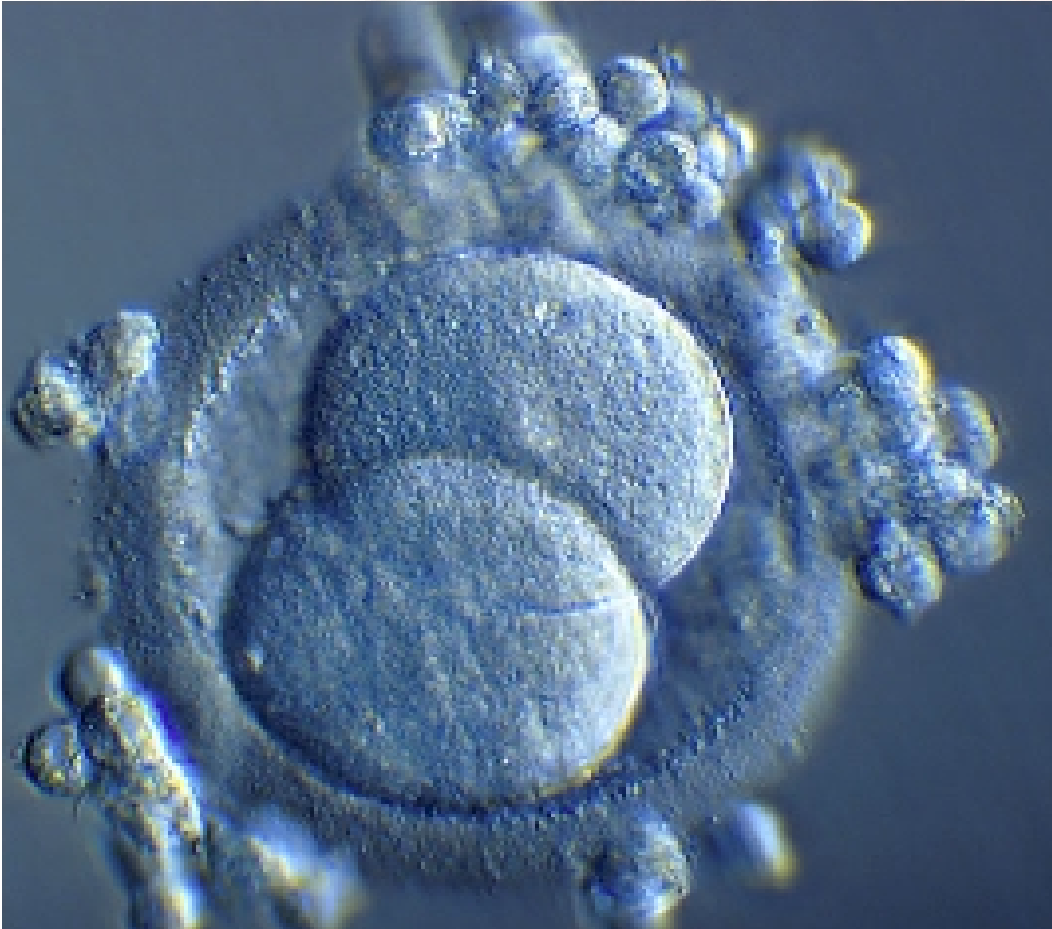


# Observation of zygote

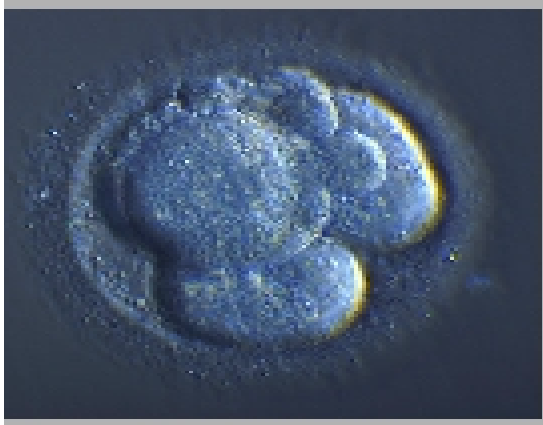
Day (1): Pronuclear stage embryo



Day (1) two cell embryo



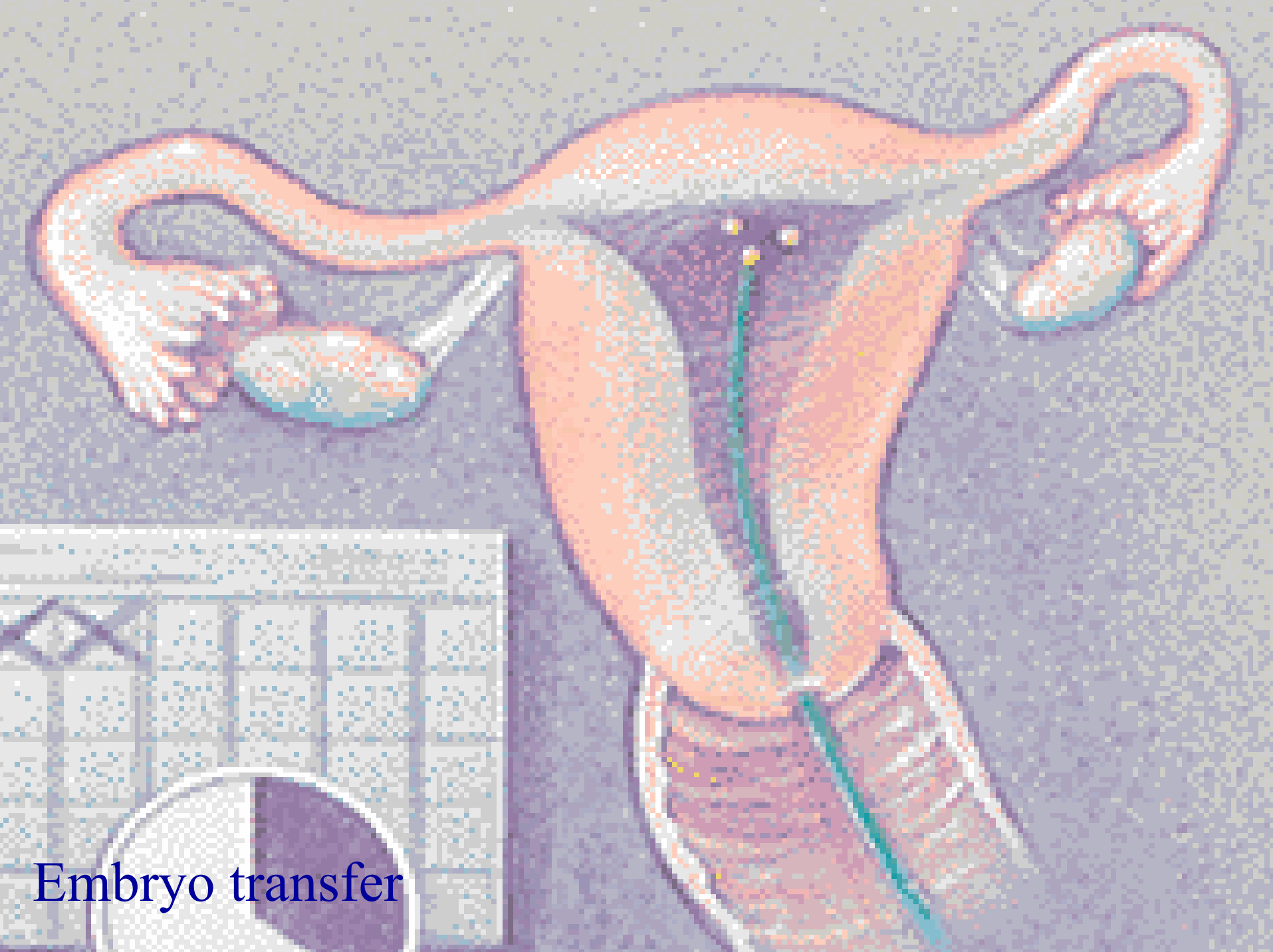
Day (2): 4-cell stage embryo quality.



Day (4): Morula stage

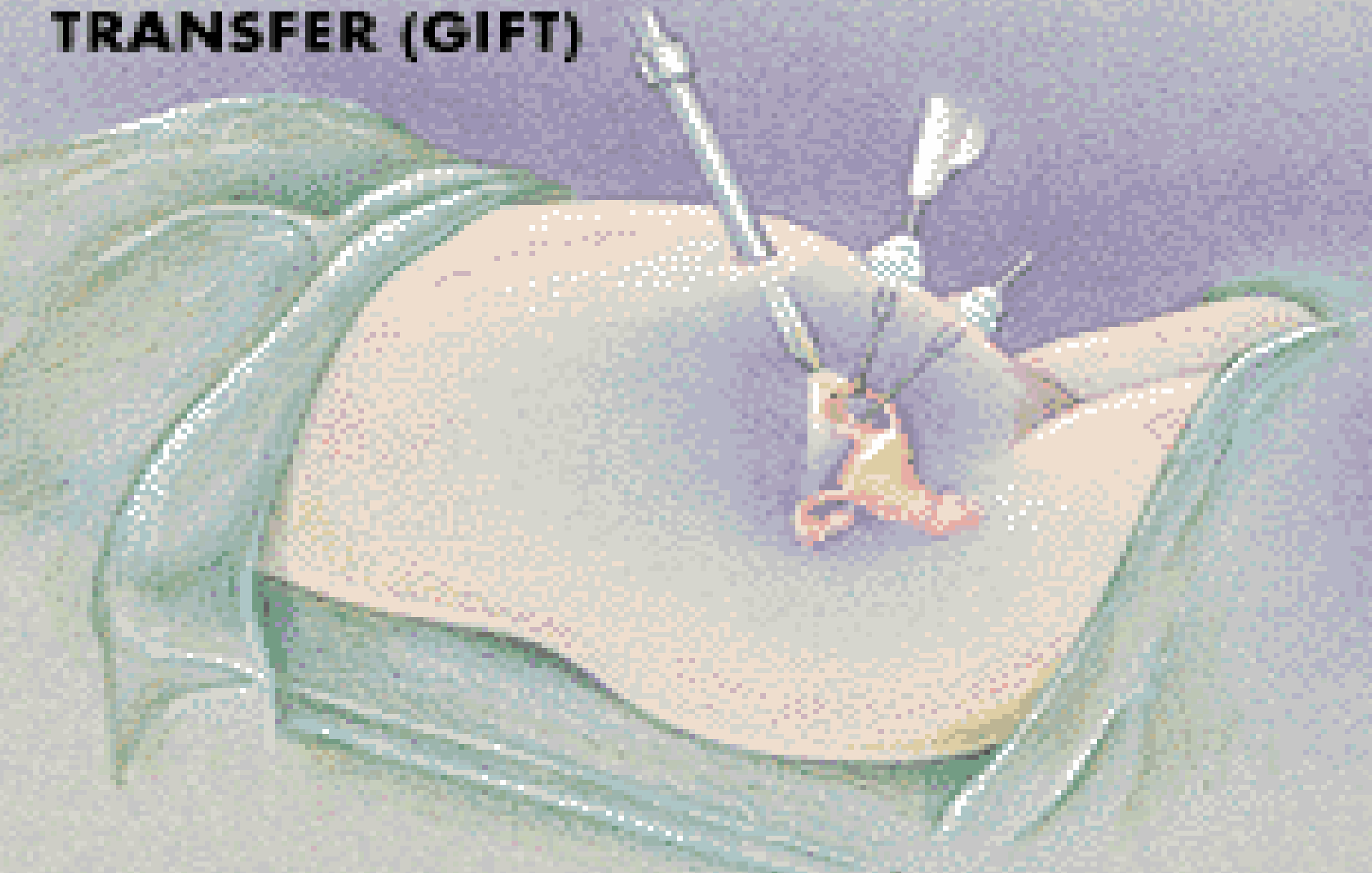




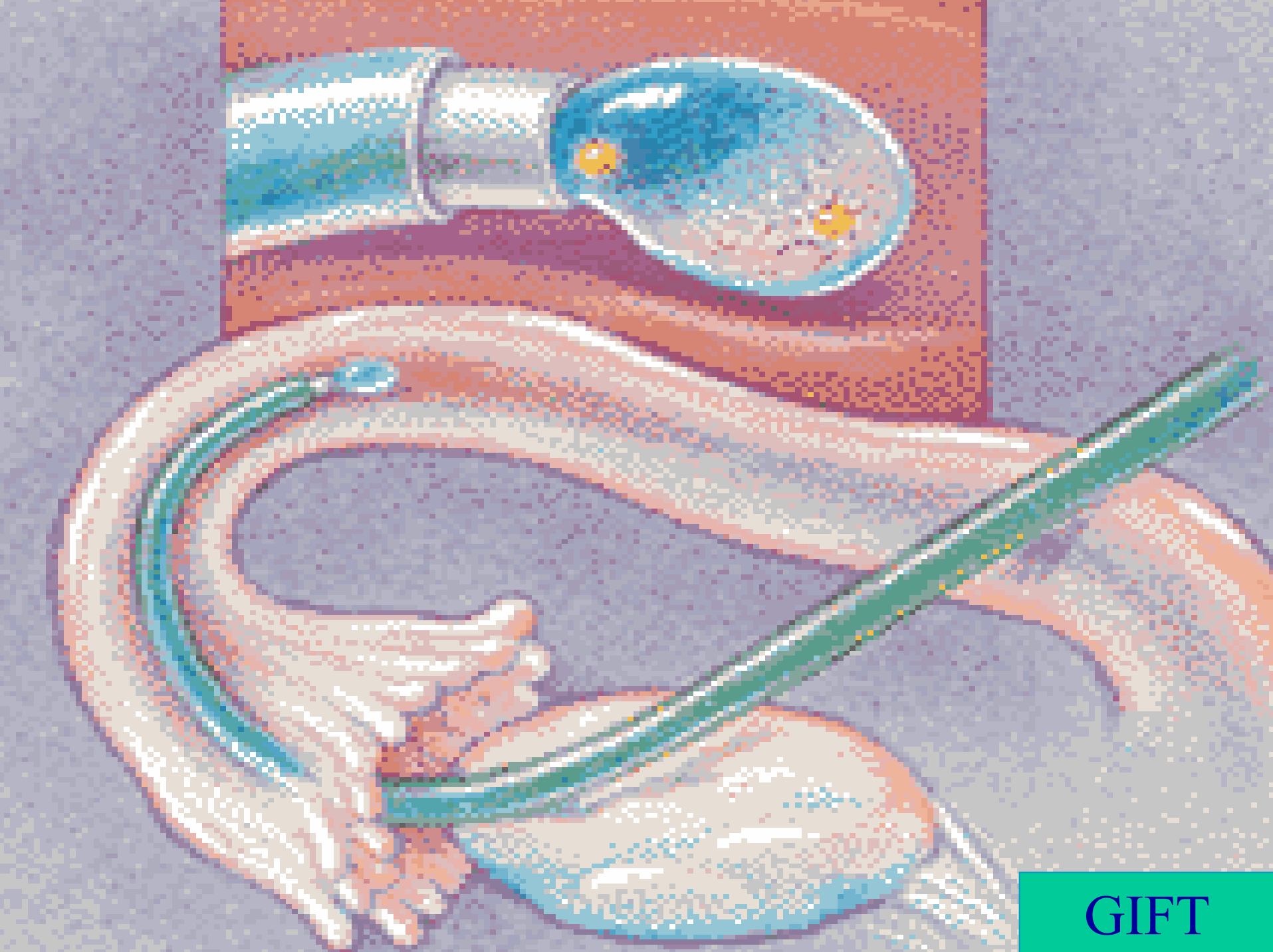


Embryo transfer

# GAMETE INTRAFALLOPIAN TRANSFER (GIFT)



**Laparoscopy**



GIFT

# What are the risks of ART?



Risk due to ovarian stimulation

Risk due to oocyte retrieval

Risk due to embryo transfer

Risk due to ICSI

# What is the success rate of ART?

## IVF

Deliveries per retrieval ..... 29.1%

## ICSI

In women < 35 years without male factor infertility..... 35.7%

In women > 35 years with male factor infertility..... 35.1%

In women < 40 years without male factor infertility..... 10.3%

In women > 40 years with male factor infertility..... 12.8%

## GIFT

In women < 35 years without male factor infertility..... 34.9%

In women > 35 years with male factor infertility..... 22.2%

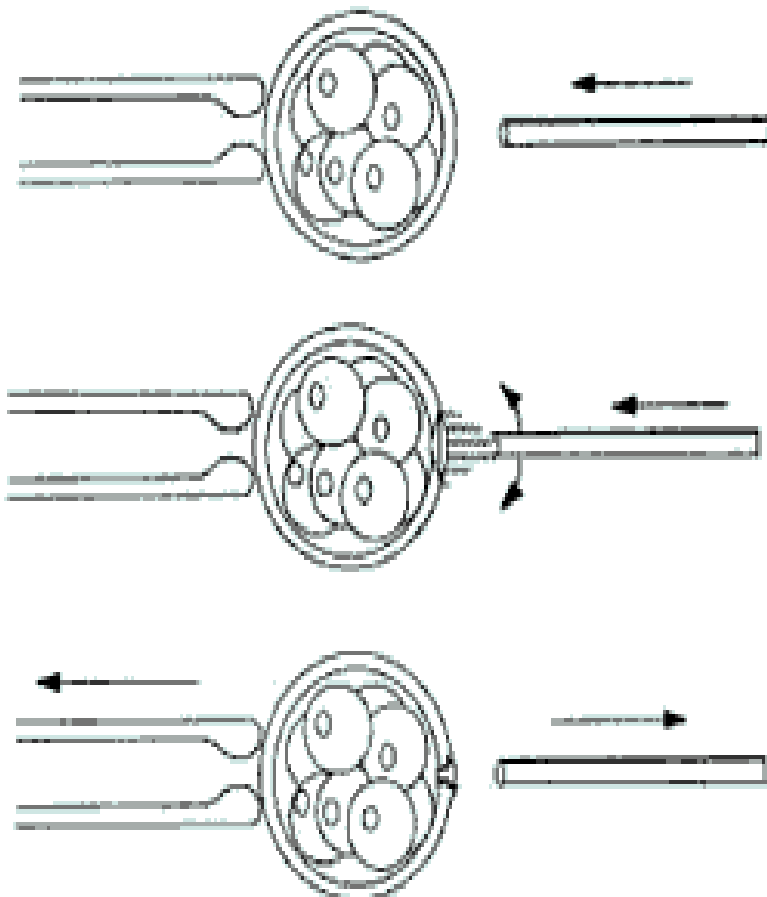
In women > 40 years without male factor infertility..... 09.1%

In women > 40 years with male factor infertility..... 11.1%

# Mechanical assisted hatching

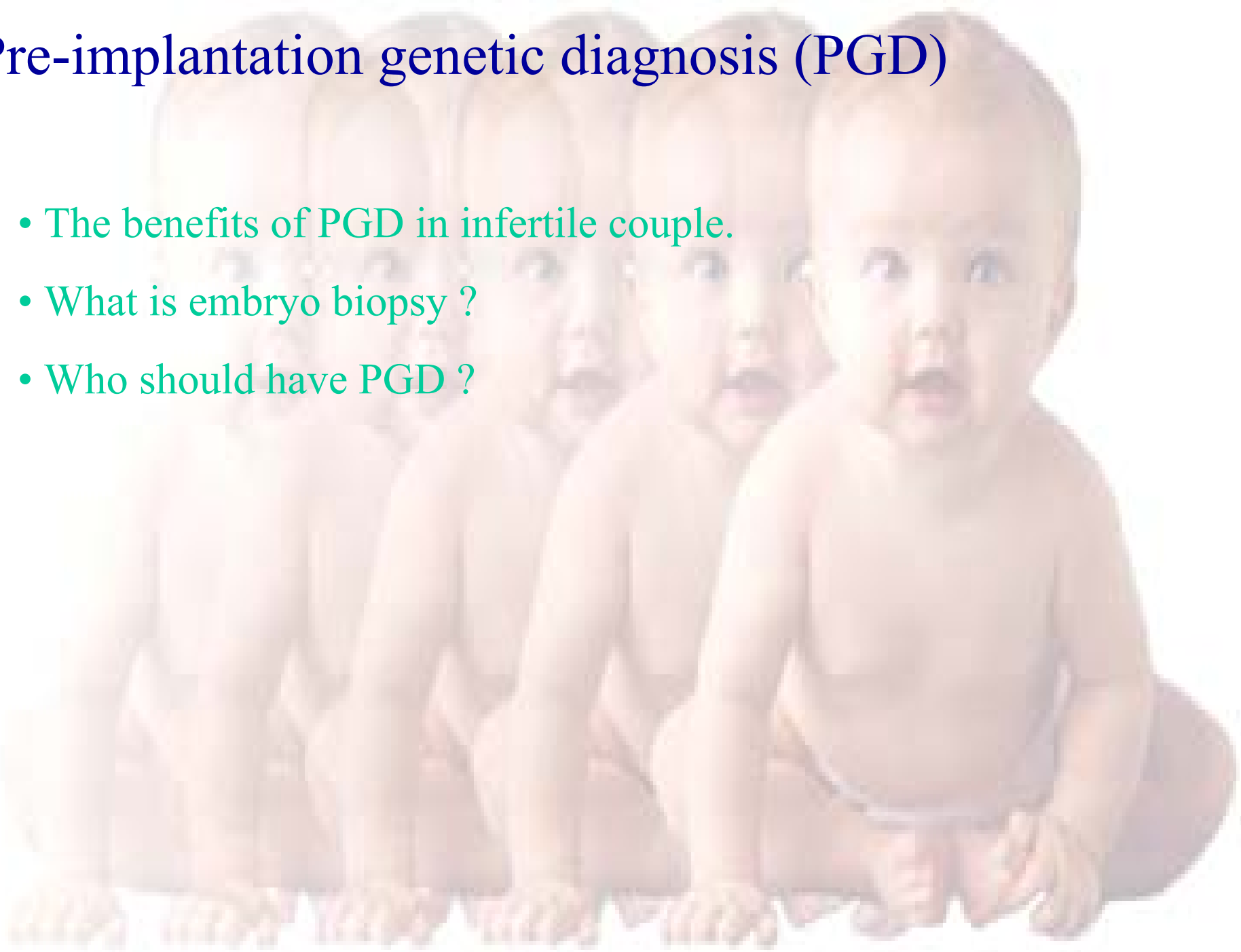


# Assisted hatching



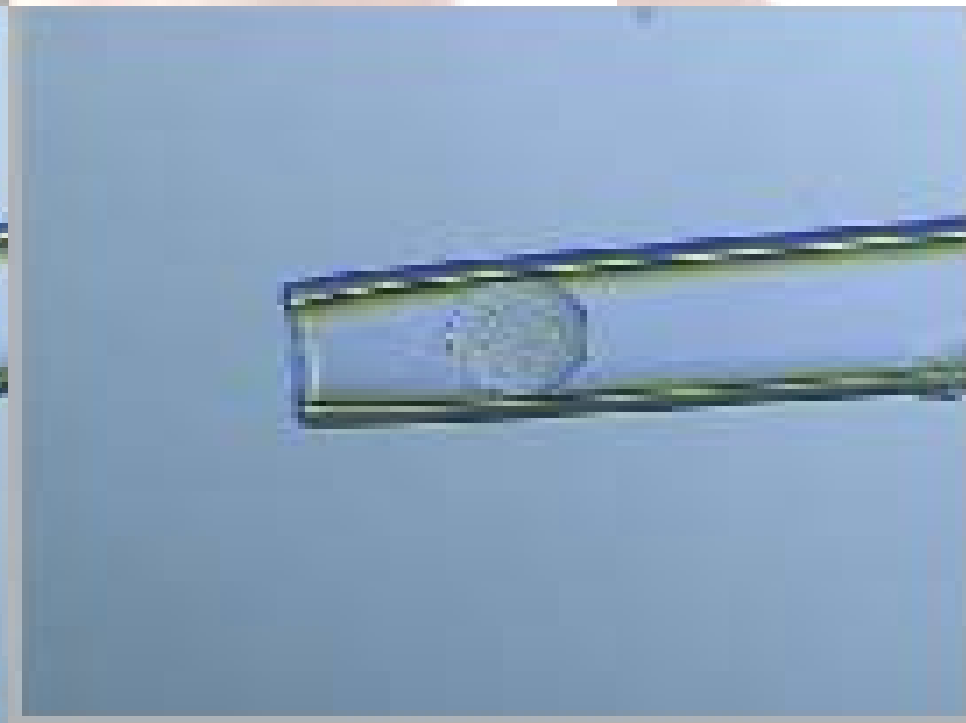
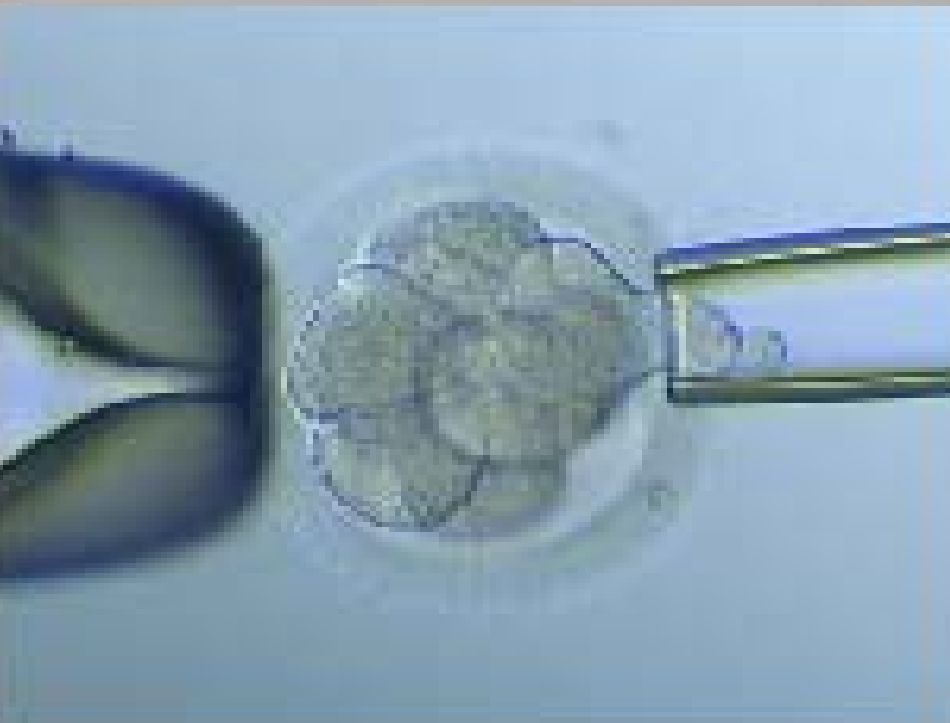
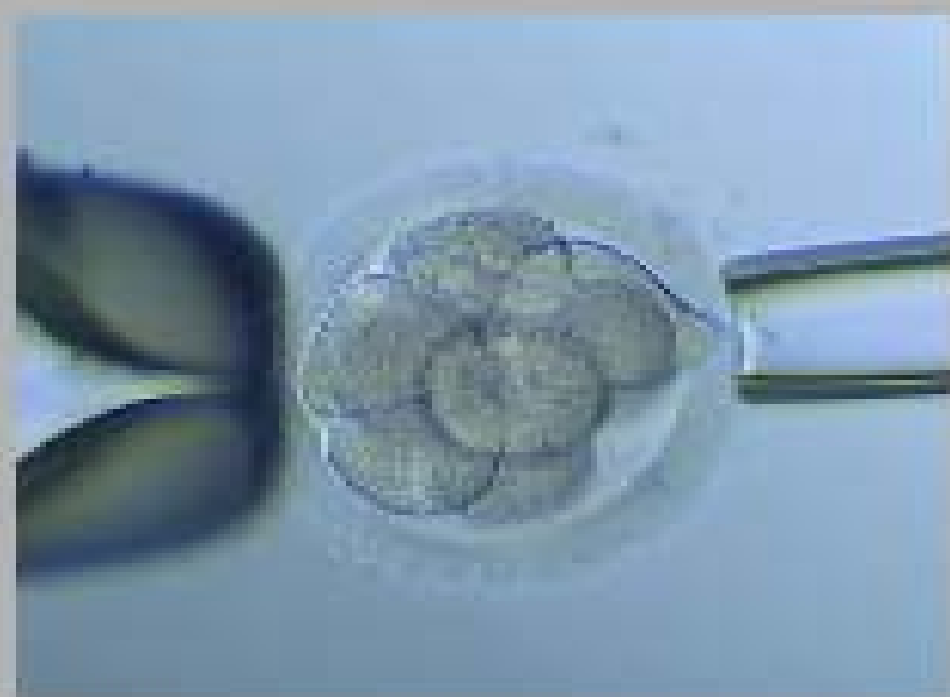
# Pre-implantation genetic diagnosis (PGD)

- The benefits of PGD in infertile couple.
- What is embryo biopsy ?
- Who should have PGD ?





# Embryo biopsy



# What are the future perspectives in ART

Ovarian tissue cryopreservation

