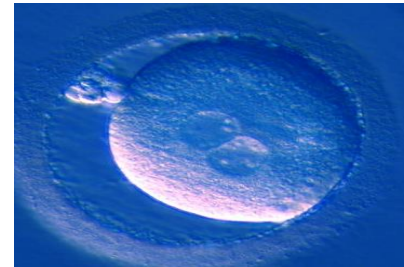
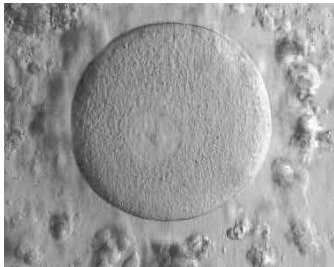
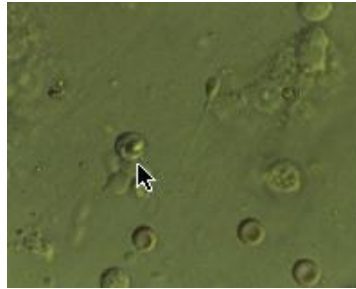


Understanding eggs, sperm and embryos

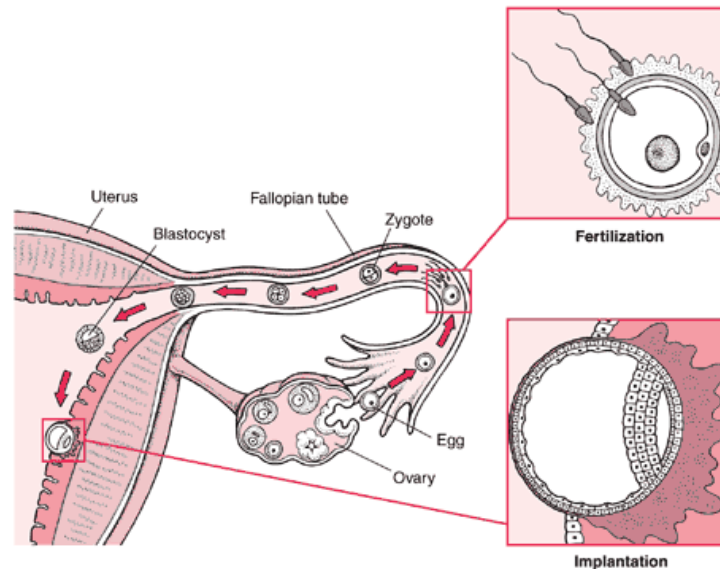
Marta Jansa Perez
Wolfson Fertility Centre

What does embryology involve?



Aims of the embryology laboratory

Creation of a large number of embryos and supporting their development in optimal conditions



Selection of the embryo/s with the highest implantation potential-tools?

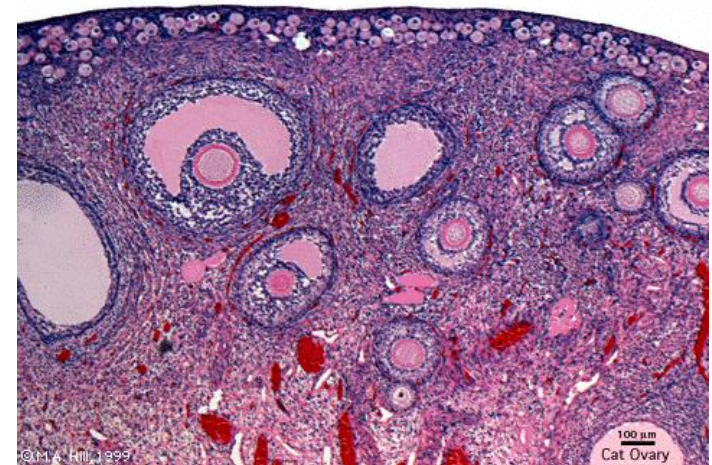


What can be controlled

- Stimulation protocols
- Lab environment; air quality requirements
- Culture conditions
- Gamete and embryo handling protocols

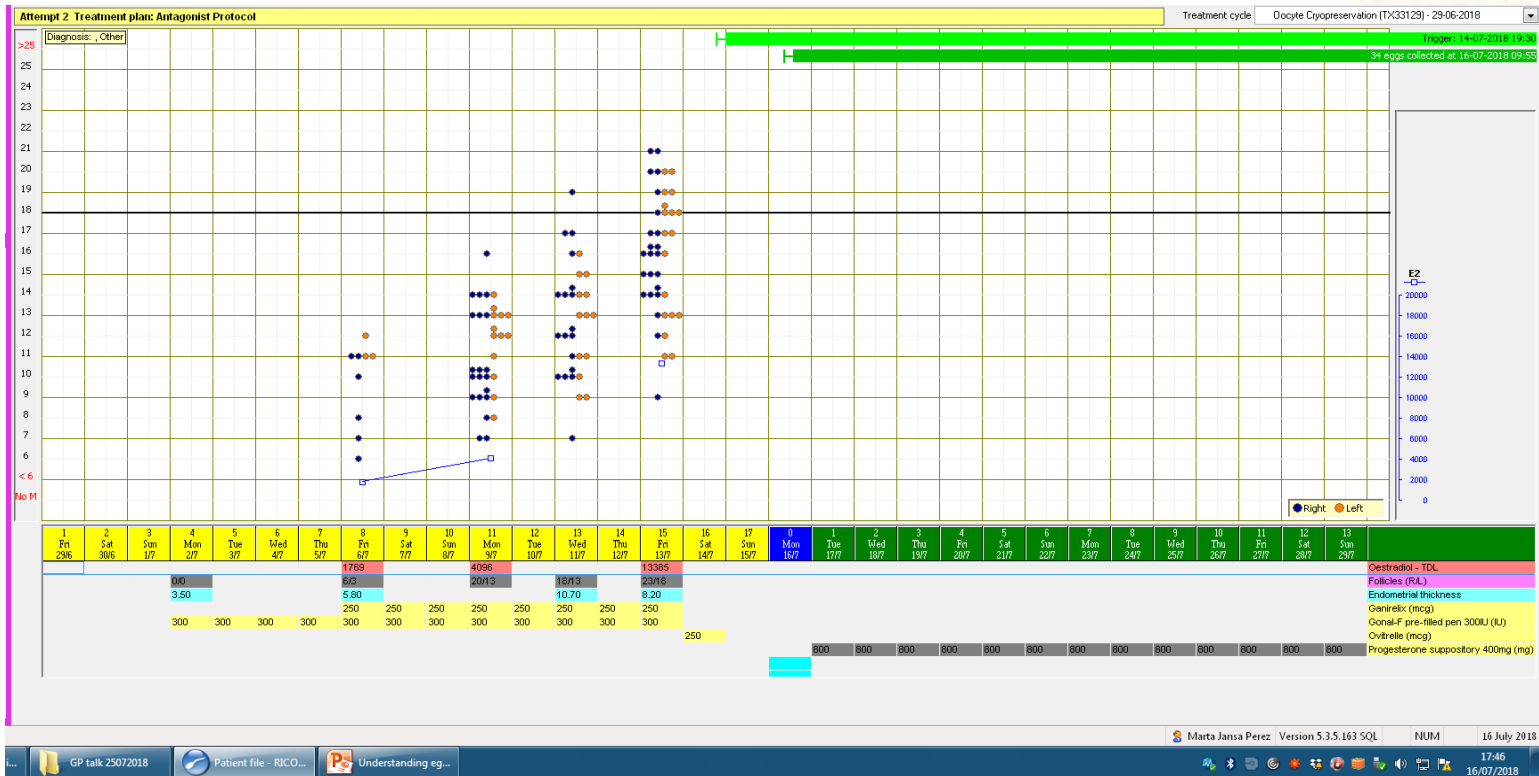
What can not be controlled

- Patient population: age, BMI, diagnosis
- Developmental potential of the eggs/embryos

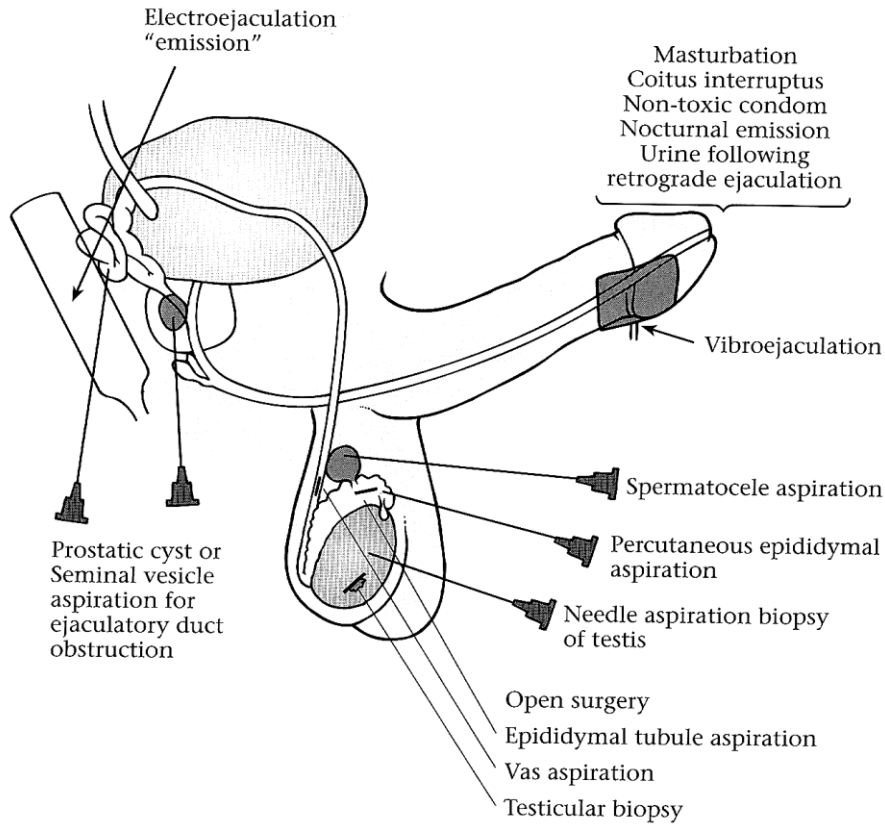


Gamete production - Oocytes

- Pituitary suppression
 - GnRH agonist and antagonist protocols
- Multifollicular development (FSH)
- Maturation trigger
- Oocyte recovery at 36-38hrs post trigger



Sperm source



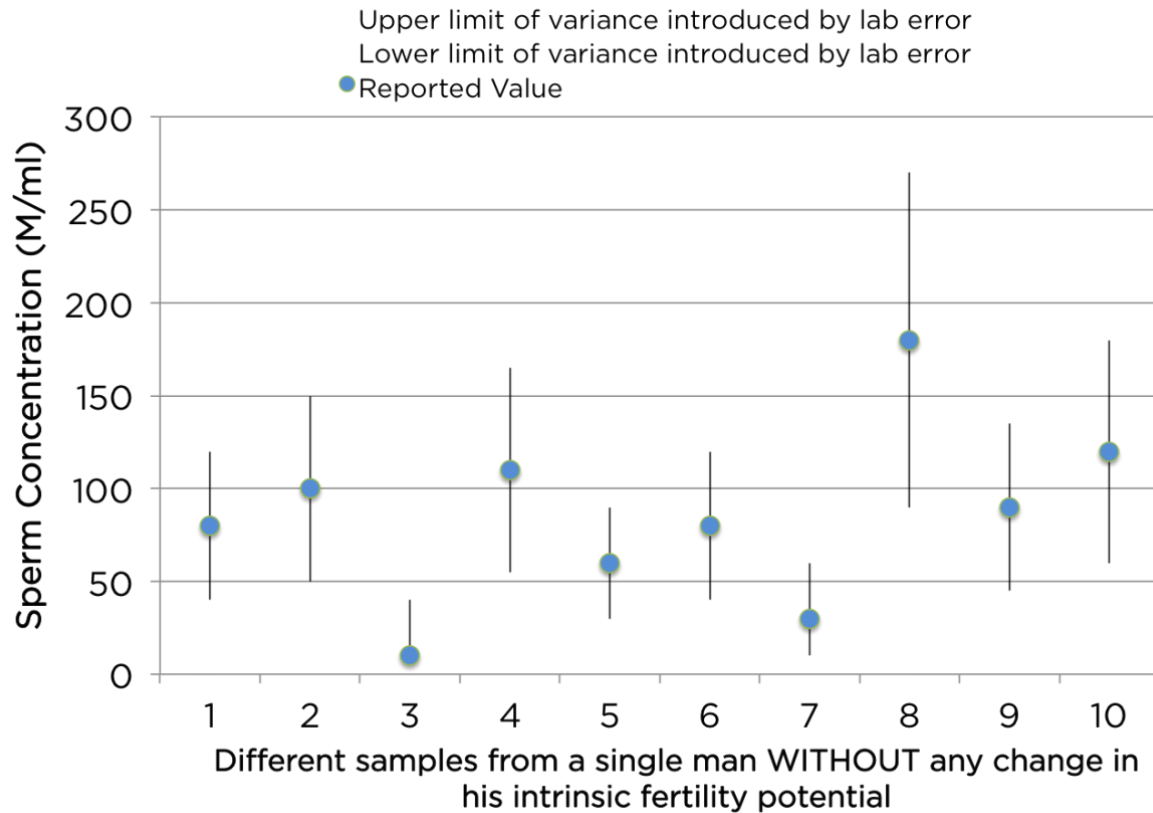
Sperm analysis parameters- what is normal?

World Health Organization reference values:

- semen volume: **1.5 ml or more**
- pH: 7.2 or more
- sperm concentration: **15 million spermatozoa per ml or more**
- total sperm number: 39 million spermatozoa per ejaculate or more
- total motility (percentage of progressive motility and non-progressive motility): **40% or more motile or 32% or more with progressive motility**
- vitality: 58% or more live spermatozoa
- sperm morphology (percentage of normal forms): **4% or more**

Normal values are based on data from men with proven fertility, by their partners conceiving in the previous 12 months

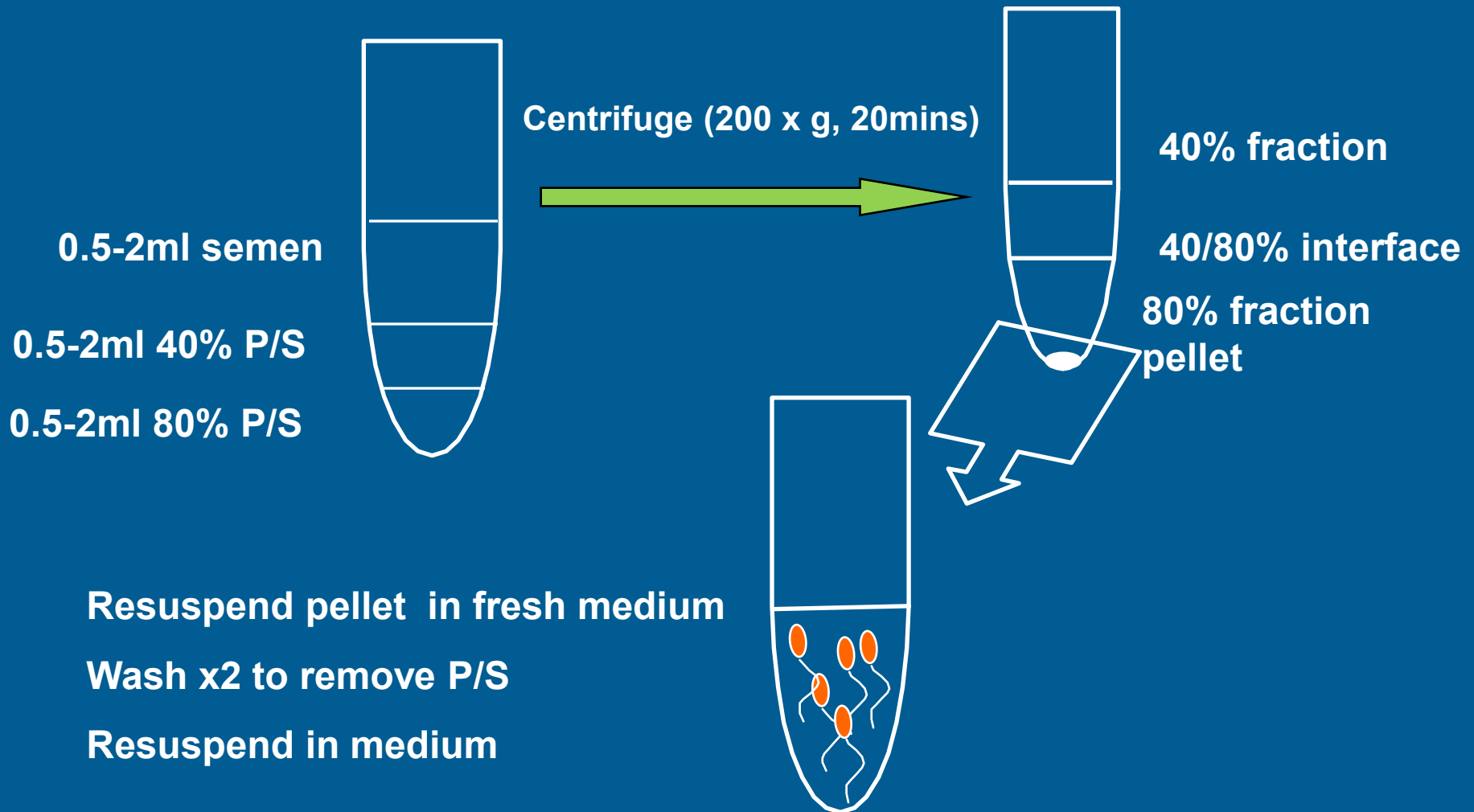
Variation in Semen Analysis Results



SEMEN ANALYSIS IS NOT A DIAGNOSTIC TEST WHICH CAN DIFFERENTIATE FERTILE FROM INFERTILE MEN

With the sole exception of men with azoospermia

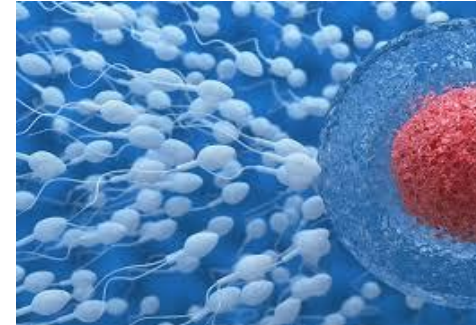
Concentrating motile sperm



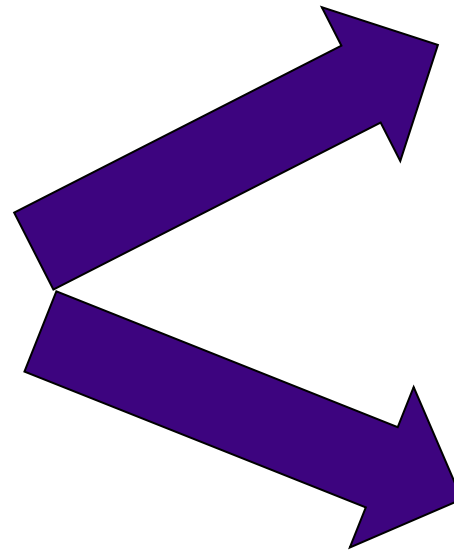
IVF / ICSI Treatment Cycle



**Egg Collection
+
Sperm Analysis
and Preparation**



**IVF Insemination
OR
IntraCyttoplasmic
Sperm Injection**

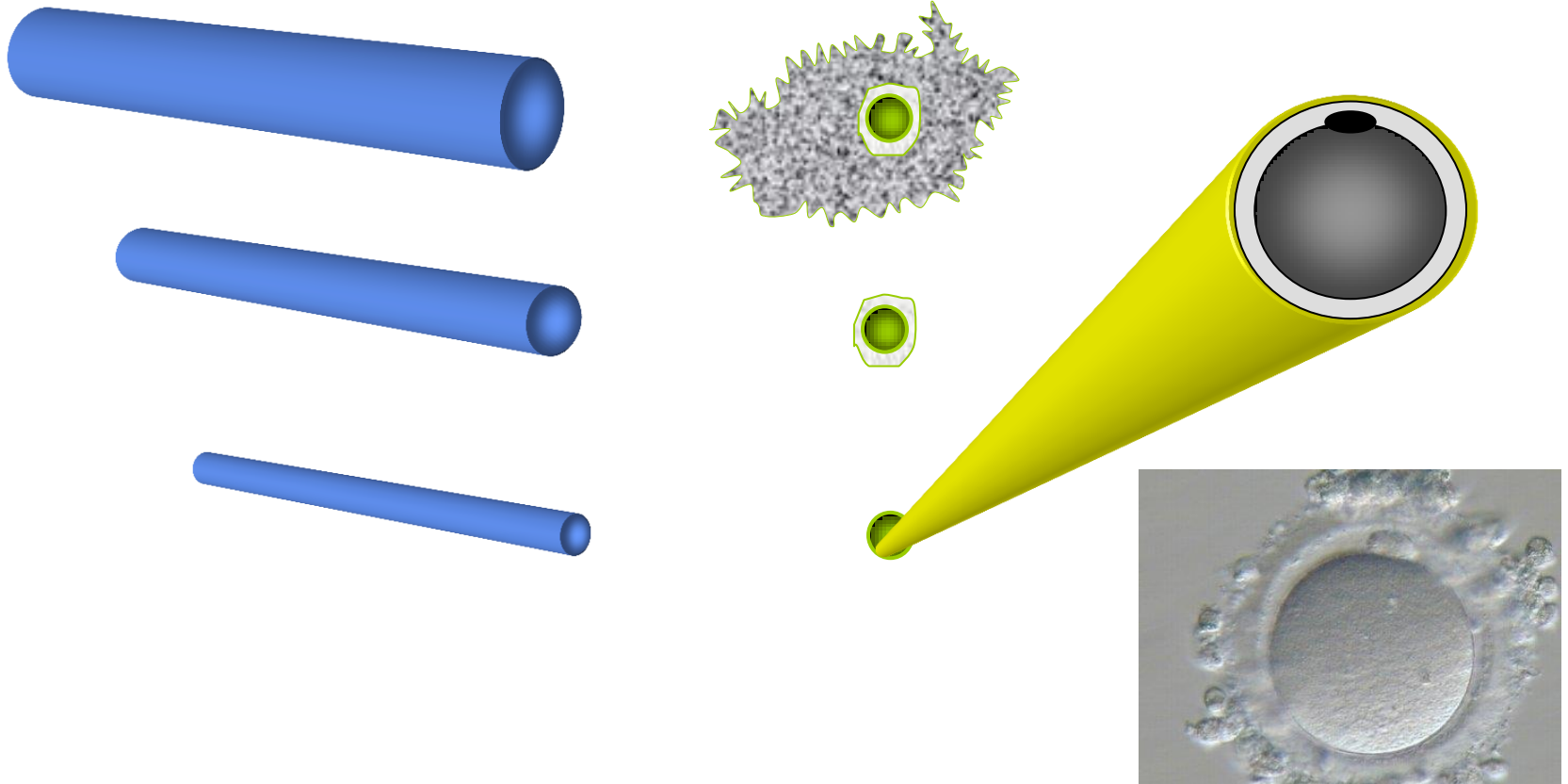


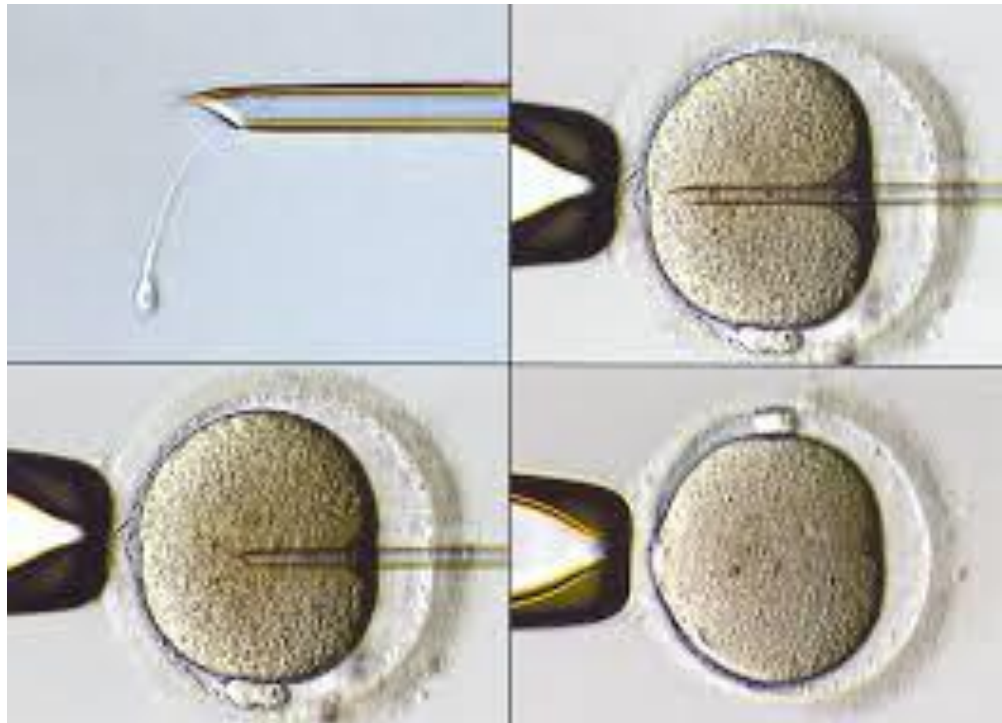
**Depending on sperm
parameters and
patients' history**



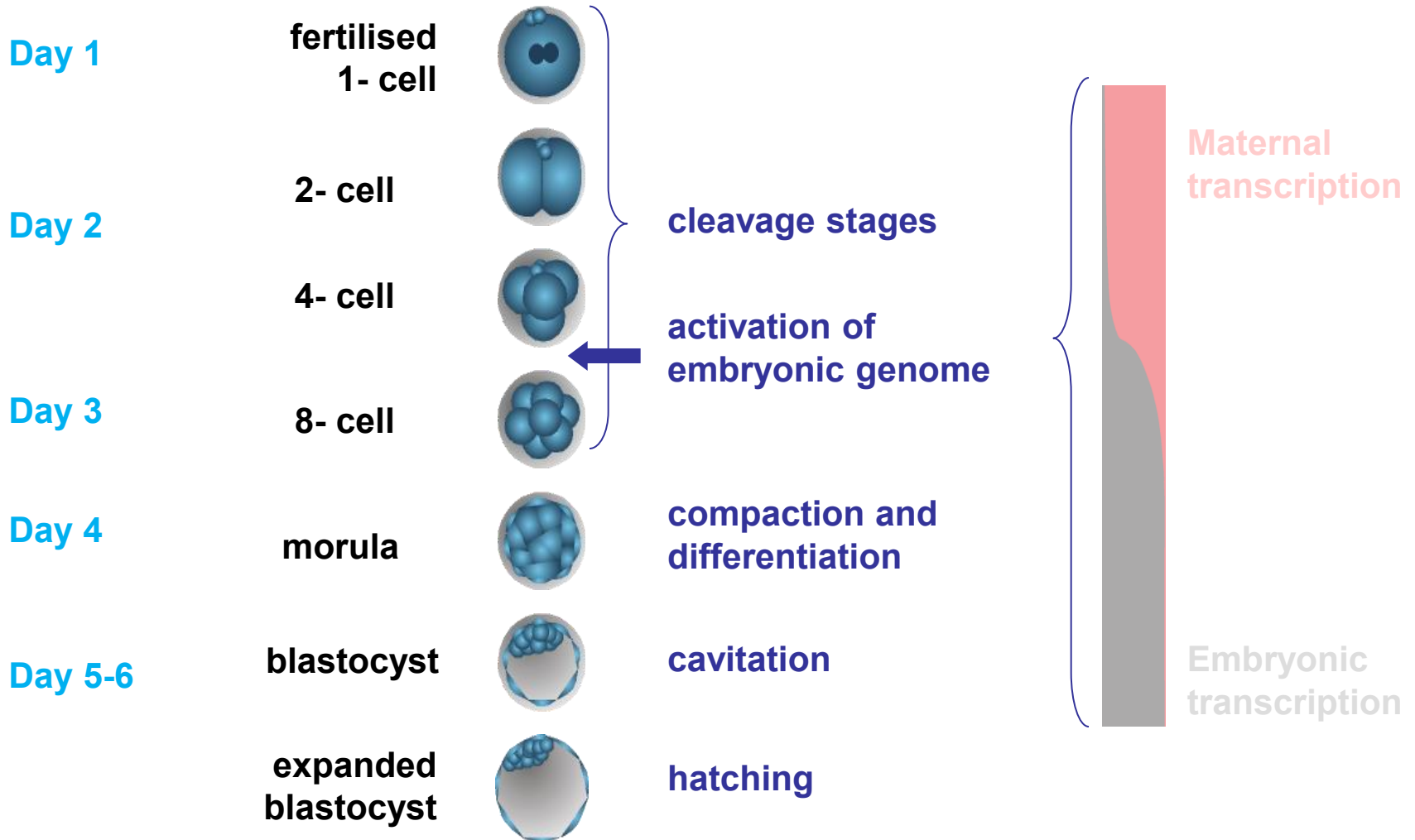
ICSI

Oocyte denudation – removal of cumulus cells by cumulase and mechanical action

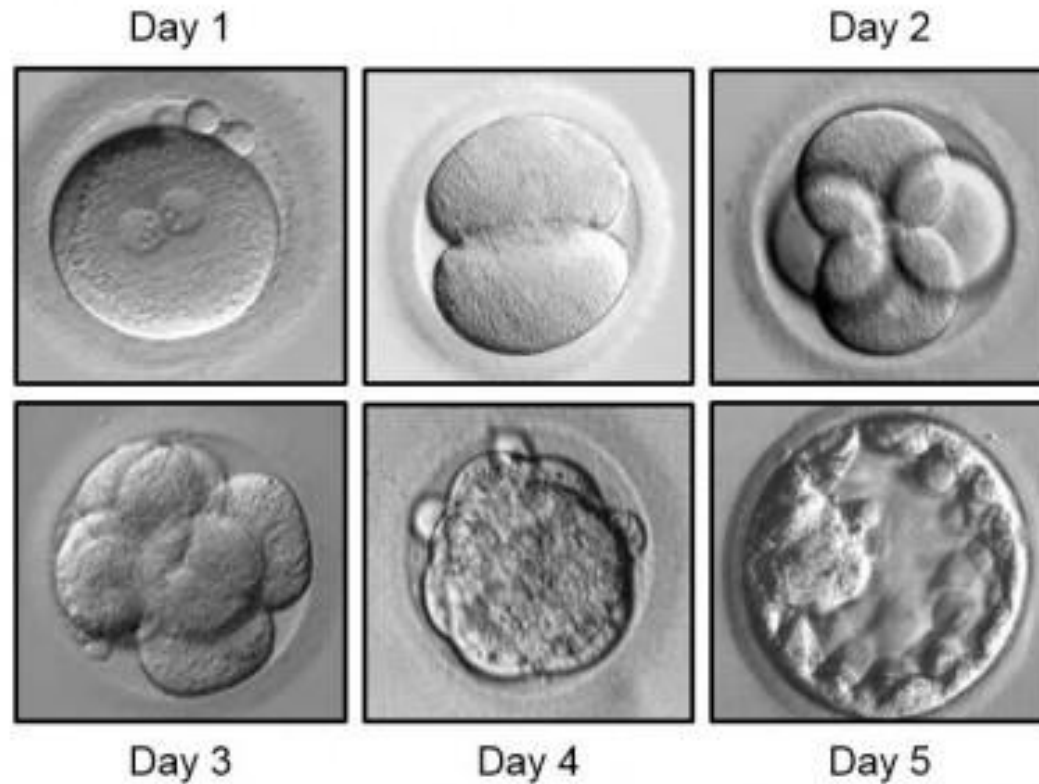




After Fertilisation



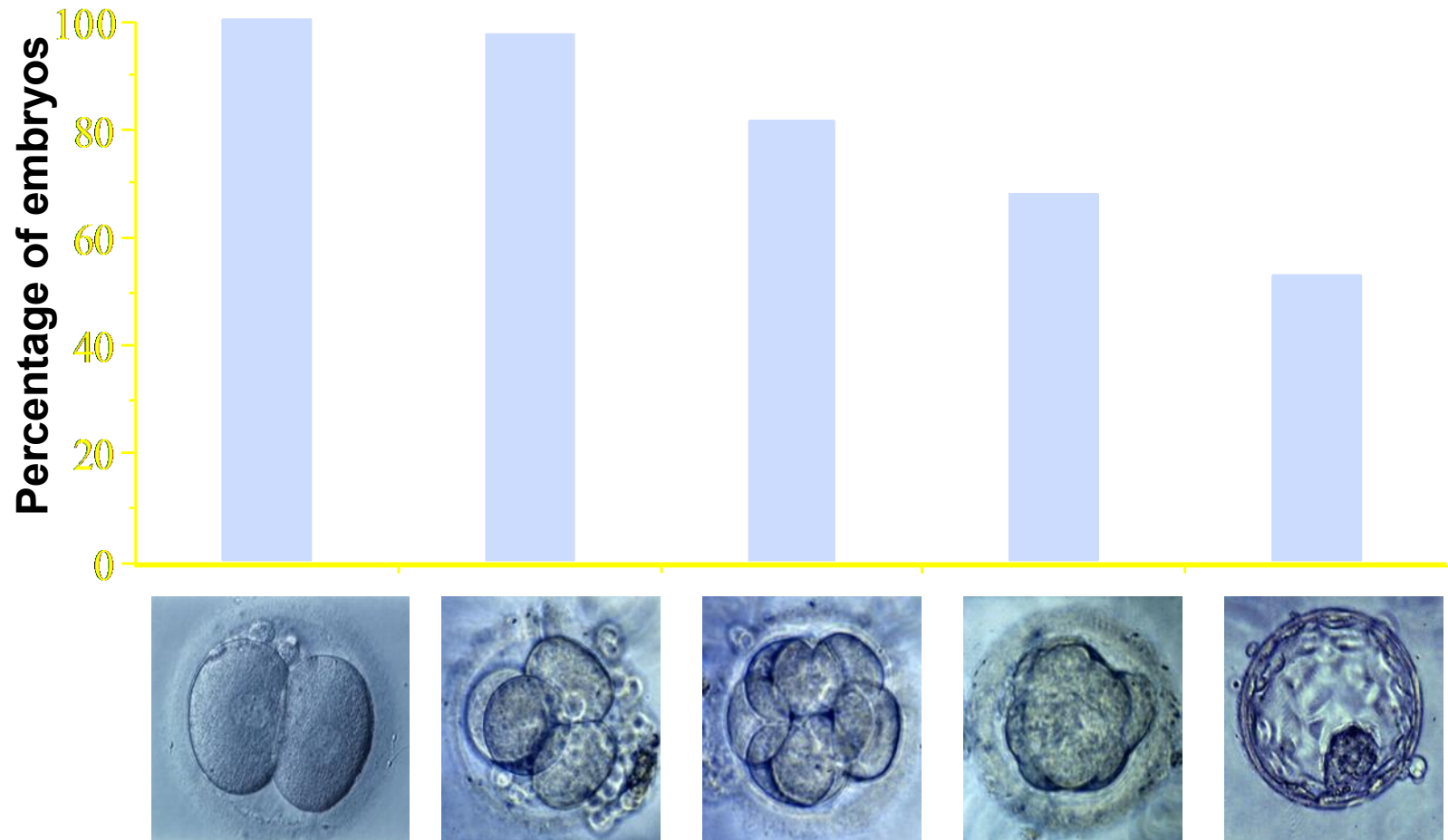
Embryo Development



Embryo Development

Using time lapse videos you can see an embryo develop from fertilisation stage (Day 1) to the blastocyst stage (Day 5)

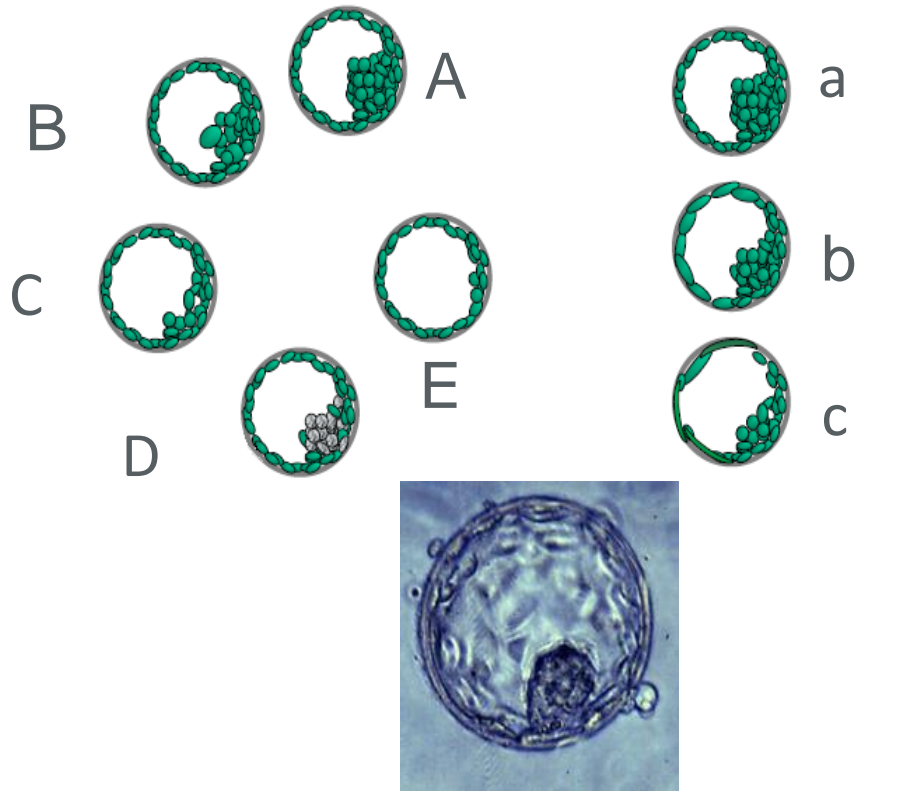
Human embryo arrest *in vitro*



Blastocysts

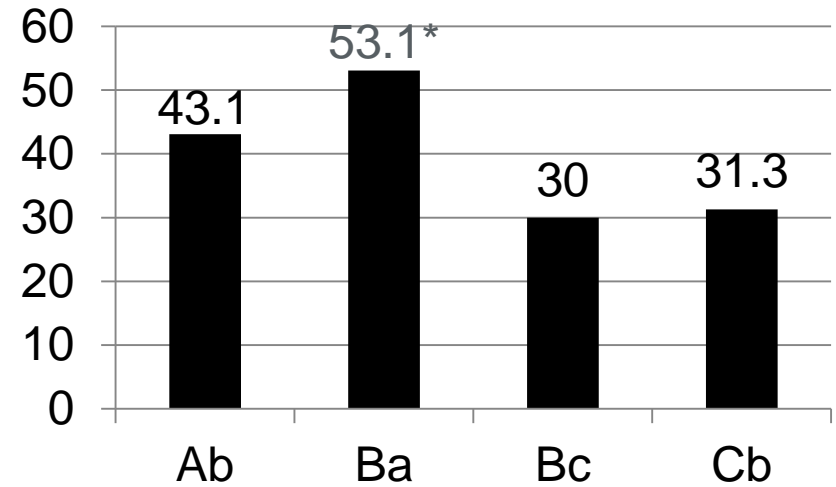
Inner Cell Mass

Trophectoderm



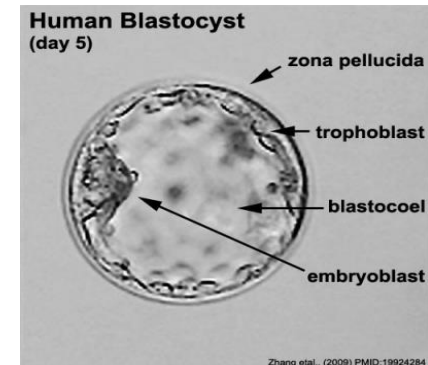
Trophectoderm or Inner Cell Mass Grade – which has a greater influence on embryo implantation?

Implantation rate



Embryo Transfer

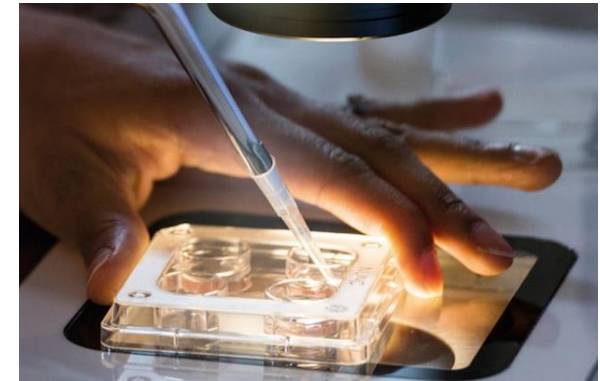
- Days 3 or 5 of embryo development depending on number and quality of embryos
- Blastocyst culture is offered for better selection of the best embryo(s) for transfer
- Discussion with embryologist about embryo quality for transfer and potential cryopreservation



Single Embryo Transfer Policy

Need to minimise the number of twin pregnancies

Single embryo transfer in the first cycle for patients <37 yrs with good quality embryos (53% CPR)



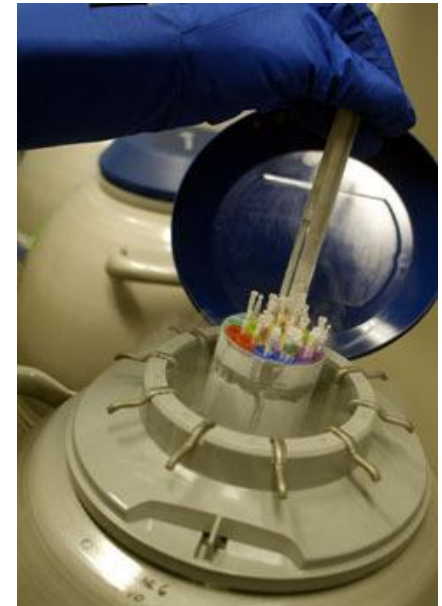
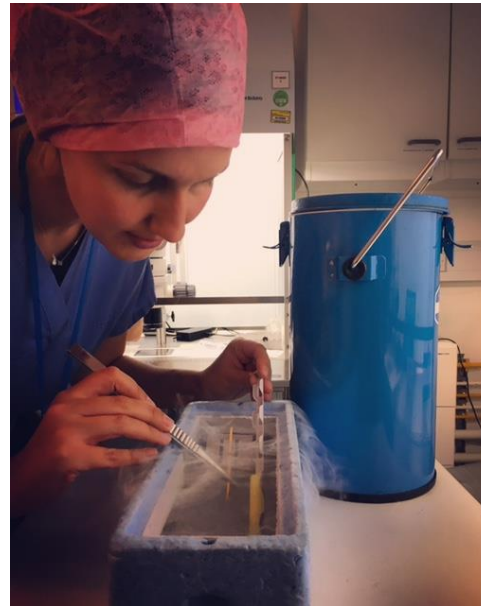
Embryo Cryopreservation

Use of vitrification to cryopreserve surplus, good quality embryos for future use

Success rates comparable between fresh and frozen embryos

Can also vitrify eggs

- Fertility preservation
- Social reasons



E-Freeze

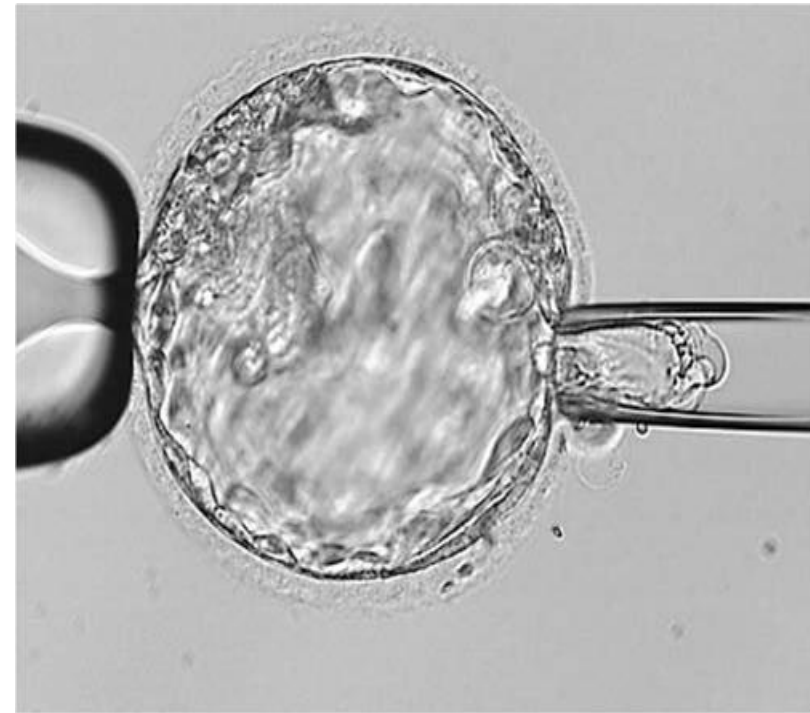
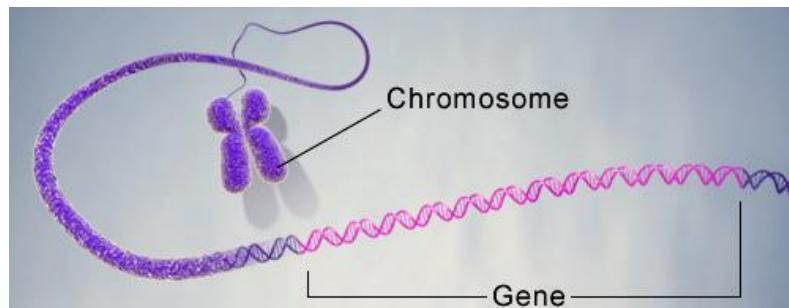
The logo for 'E-Freeze' features the text 'E-Freeze' in a green, sans-serif font. The final 'e' is stylized as a green circle with a white highlight, and a green swoosh curves around it from the bottom and right.

To determine if a policy of freezing created embryos, followed by thawed frozen embryo transfer is a more **clinically** effective, **safer** and **cost effective** way to provide in-vitro fertilization when compared with the current practice of transferring fresh embryos.

PGD/PGS

Testing of embryos using:

- **PGD for specific genetic disorders - HFEA licence for each condition**
- **PGS screening for aneuploidies**



The IVF laboratory



The IVF Laboratory Employing the Latest Technology

HFEA licence

State of the ART technology

Enhanced confidence with RI
Witness™ - electronic witnessing
system



RI WITNESS™

Monitoring system for all critical laboratory equipment

The screenshot displays the ViGIE monitoring system interface. The main area features a line graph titled "PINK 1 L Temp" for the "IVF | IVF&CSI LAB". The graph shows a temperature that is mostly stable at approximately 37.10°C, with some initial fluctuations between 13/07 and 14/07. Below the graph, a summary bar indicates the current temperature is 37.10°C, with a minimum of 36.00°C and a maximum of 37.10°C. The right sidebar lists various pieces of equipment, including "PINK 1 Contactor", "PINK 1 L Temp", "PINK 1 R Temp", "PINK 2 Contactor", "PINK 2 L Temp", "PINK 2 R Temp", "PINK 3 Contactor", "PINK 3 L Temp", and "PINK 3 R Temp". The interface includes a navigation menu at the top with options like "Sensors", "Energy", "Transport", "VIGIE GO", "Alarms", "Floor Plans", "Analysis", "Reporting", and "PLUS!". The bottom of the screen shows a Windows taskbar with several open applications and the system clock at 15:00 on 14/07/2017.

Thank you

