
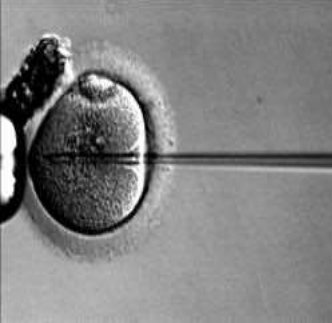



## Infertility & Reproductive Technology


**Objectives:**

1. Infertility
2. Reproductive Technology



**CHLAMYDIA THE EFFECTS**



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1. Infertility (Review Reproductive A&P Lecture Notes)	
Female Infertility ↑ AGE	Male Infertility
uterine fibroids	Kline Felter's
Turner syndrome	Anabolic steroid abuse
high WHR	high WHR (not as problematic)
Chemotherapy	Chemotherapy
Endometriosis	STDs
PCOS ↘	BPH
Ovarian cancer	↑ AGE
Eating disorders	
anabolic steroid abuse	/
STDs	

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## 2. Reproductive Technologies

### Fertility Drugs

Ex. Clomid = Dose of pituitary LH & FSH

- Stimulates egg development & ovulation.
- Usually multiple eggs ovulated at same time.
- Cost varies \$50 for 10 tablets



- **Risks: Increased chance of:**

Multiple pregnancies  
 low fetal <sup>baby</sup> birth weight  
 ↑ risk of premature  
 ↑ chance birth  
 C-section - -

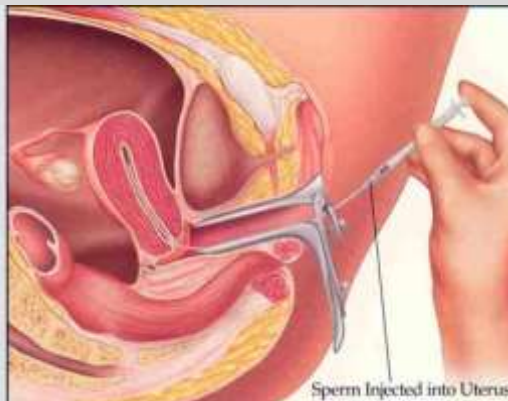


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## Artificial Insemination

- Sperm (semen) sample inserted with catheter into uterus.
- Woman usually been on fertility drugs (ovulated multiple eggs to ↑ chance of working).  
 - Timing is everything!

<https://www.webmd.com/infertility-and-reproduction/guide/artificial-insemination>



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## In vitro fertilization (IVF)

### **Woman undergoes 3 procedures:**

1. Woman on fertility drugs (↑ ovulation of eggs)

2. Ovulated eggs are collected

- Eggs mixed w/sperm in “tube” to create zygotes.
- Best zygote” selected from among many for implanting.
- Rest frozen.

3. Selected zygotes are implanted into uterus.

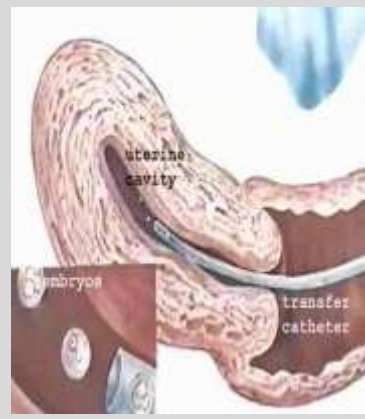
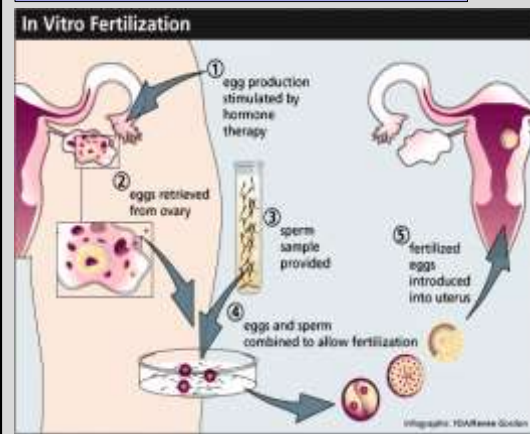
- Not all implants “take”.
- Average # tries for success for women less than 40 yrs = 5-6 treatment cycles
- Very expensive! \$15,000 – 30,000 per trial
- CDC estimates about 1 – 2% of births in US are through IVF (~4 million)
- But sometimes multiple zygotes implant.
- Zygote personhood laws being considered would outlaw this procedure! (Ex. Alabama, 2024)

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### **IVF (test-tube baby)**

1. Go on fertility drugs
2. Collect ovulated eggs (procedure 1)
3. Mix eggs with donated sperm in “dish”
4. Select “best embryos” to implant in uterus.

Click [HERE](#) for YouTube video on IVF



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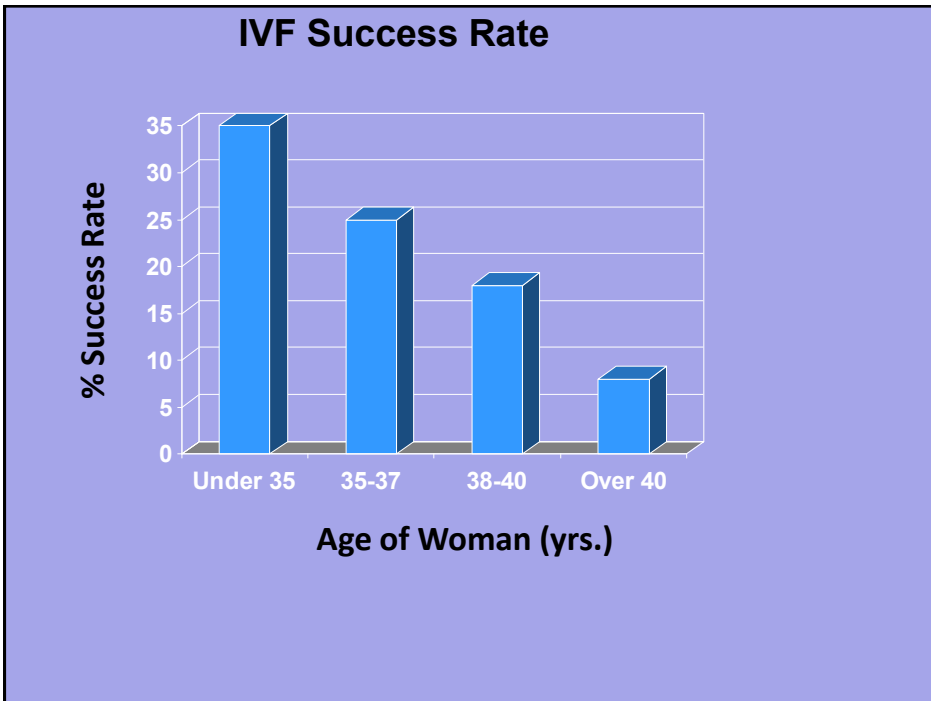
### In-Vitro Fertilization (test-tube baby)



#### **Louise Brown**

- Born July 25, 1978 in England
- First “test tube baby”
- Gave birth to her own baby boy (without aid of in-vitro) in 2006

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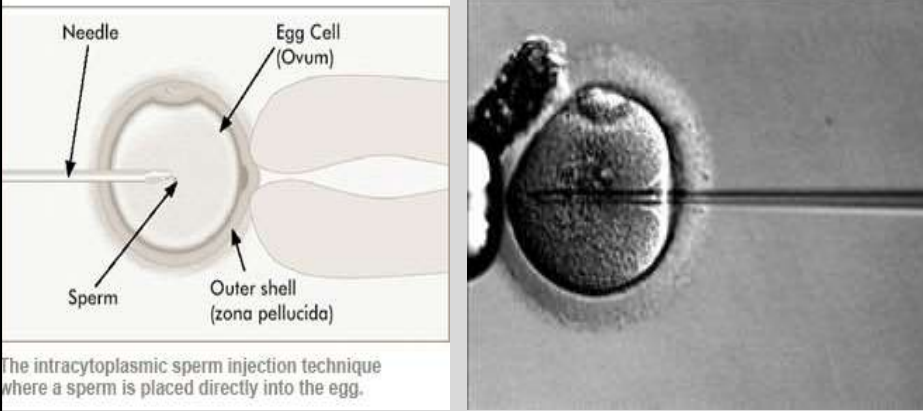


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## Intra cytoplasmic sperm injection (ICSI)

1. Woman goes on fertility drugs
2. Collect ovulated eggs (procedure 1)
3. Inject single sperm cell into each egg.
4. Select "best embryos" to implant in uterus (procedure 2)

Click [HERE](#) for YouTube video of ICSI



The diagram on the left shows a cross-section of an egg cell with a needle inserted into the cytoplasm. Labels include: Needle, Egg Cell (Ovum), Sperm, and Outer shell (zona pellucida). The micrograph on the right shows a real-time view of a sperm being injected into an egg cell.

The intracytoplasmic sperm injection technique where a sperm is placed directly into the egg.

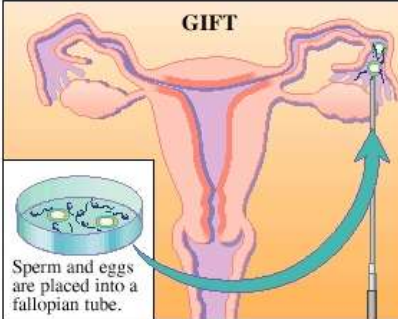
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## Gamete Intra-fallopian Transfer (GIFT)

1. Woman goes on fertility drugs
2. Combine collected eggs with with sperm in petri dish .
3. Put eggs and sperm directly into fallopian tubes & allow for fertilization.

**GIFT**

With GIFT, sperm and eggs are placed in a fallopian tube to allow fertilization in the natural site. The woman must have at least one normal, open fallopian tube.



The diagram shows a female reproductive system with a fallopian tube highlighted. An inset shows a petri dish with sperm and eggs. A green arrow indicates the transfer of these gametes into the fallopian tube.

Sperm and eggs are placed into a fallopian tube.

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## Ovary Transplant

First done in 2004

Identical twin sisters – one sister donated ovarian tissue to her other sister (same genetic info so no tissue rejection).

You can also “freeze” your ovary if you have to undergo cancer treatment.

> cost of procedure is ~ \$3,000

> Then can get ovary transplanted back for ~ \$6,000 – 10,000)



<https://www.infertile.com/infertility-news/ovary-transplant-surgery/>

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## Freezing Sperm Freezing Eggs

1. Woman goes on fertility drugs
2. Collect ovulated eggs (procedure 1)
3. Use rapid-freezing (liquid nitrogen) for either eggs or sperm.

- More difficult to freeze eggs & have them viable than with freezing sperm
- Freezing eggs in the news:



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Forbes How To Survive A Bad Boss ...theirs (2/24/14) ...

**Apple Seeds Perk Wars, Adds Egg Freezing As Employee Benefit**

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**Kelly Phillips Erb**  
Contributor

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I never stop paying tax or grateful for reading about it should I be. See Me ...

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When I was in high school, I had my entire life mapped out. I planned on four years of college (three if I took classes through summer) followed immediately by three years of law school. It takes seven years to make partner at most firms which meant, I figured, that I could, by my early thirties, be a tax partner at a large firm, married to a doctor (no lawyers!) and on my way to thinking about having two kids, ideally, one right after the other (having kids before making partner would just complicate things).

But then life happened. I worked summers through college in order to pay bills so there was no time to pick up extra classes. I stayed home for a year after graduation to be with my mom (I was still working) while my dad was overseas. I decided that I actually really liked the law – especially tax law – and decided to get an additional degree. I didn't like working at a large firm and had no desire to become partner. More importantly, I met a guy – a lawyer, no less – that I decided might be the one. We got married and by my early thirties, I had not two but three kids. Funny how things don't always end up like you plan.

Nowadays, however, not all women are content to simply take their chances. They're taking matters into their own hands by planning for the future with a technological twist: freezing their eggs in order to have children on a schedule. And in some industries, such as the tech sector, employers are more than happy to help.

At least two companies in the tech sector, Apple and Facebook, are [adding egg freezing to the list of benefits](#) offered to employees. The egg freezing perk is estimated to be worth about \$20,000 (Facebook [also offers](#) a surrogacy benefit). In some cases, the benefits are also extended to spouses.

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## Choosing Gender

### MicroSort Technique

- > Normal semen sample - 50% of sperm carry X & 50% carry Y = 50 % chance of having either boy or girl.
- > Technique to “pre-sort” sperm into X-bearing or Y-bearing sperm based on mass of sperm (if carry X chromosome it's heavier).
- > Can sort with success to:
  - ~91% primarily X-bearing sperm in sample and
  - ~76% primarily Y-bearing sperm in sample.
- >Then use sample for artificial insemination.



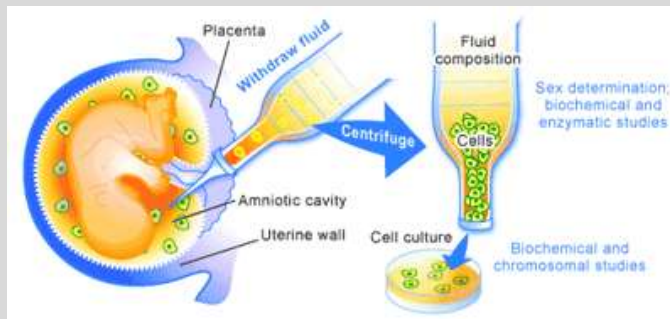
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## Pre-Implantation Diagnosis (PGD)

> “Screen” embryos (produced by assisted reprod. Technology) for genetic disorders before implanting.

> Embryos with disorders aren’t selected.

Click [HERE](#) for YouTube video on PGD



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## Review

- > Causes of infertility (men & women)
- > Fertility drugs
- > Artificial insemination
- IVF
  - > ICSI
  - > GIFT
  - > Ovary transplants
  - > Freezing eggs or sperm
- > Choosing sex (Microsort technique)
- > Pre-Implantation Genetic Diagnostics

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