

Fertility Preservation & Egg Freezing

PCOS Symposium
Breakout Session #1

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Abington Reproductive Medicine

April 18, 2015





Abington

REPRODUCTIVE MEDICINE



Locations

Abington

Price Medical Building
1245 Highland Avenue, Suite 404
Abington, PA 19001



Langhorne

Oxford Square Complex
360 Middletown Blvd, Suite 400
Langhorne, PA 19047



Lansdale

Towamencin Corporate Center
1690 Sumneytown Pike,
Suite 190
Lansdale, PA 19446



Doylestown

599 W. State Street, Suite 211
Pavilion at Doylestown Hospital,
North entrance
Doylestown, PA 18901



Bethlehem

2591 Baglyos Circle,
Suite C46
Bethlehem, PA 18020



Paoli

Paoli Medical & Executive Commons
250 West Lancaster Ave, Suite 260
Paoli, PA 19301



As well as locations in **Lancaster & East Norriton**, and on the
Einstein Medical Campus

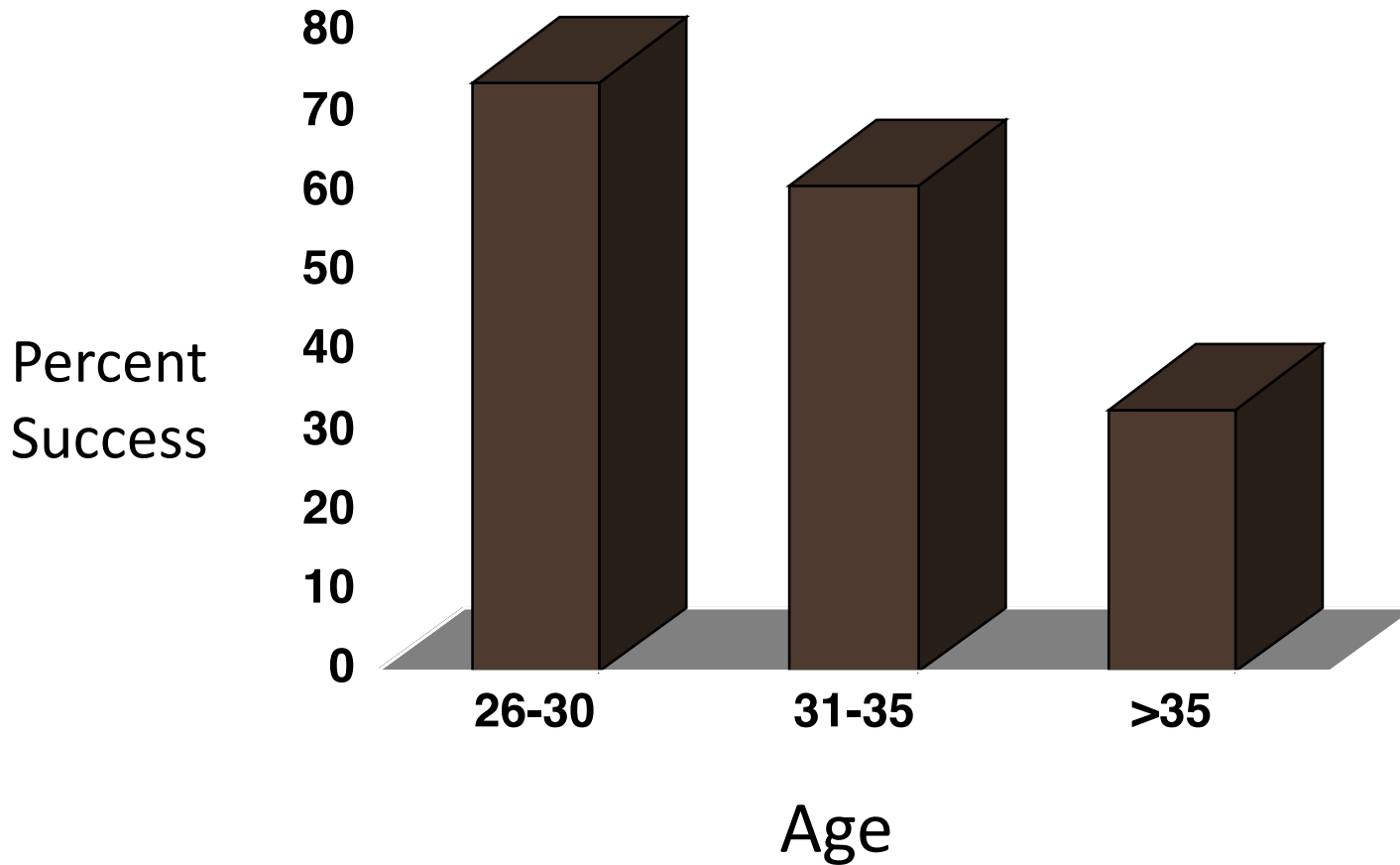
Questions from You....

- What is the process of fertility preservation?
- I have PCOS and I am not ready to start a family yet. I am worried about being able to conceive when I am ready. What are my best options?
- How does PCOS and the egg quality or number of eggs contribute to assessing if egg freezing is a good option?
- What can the test AMH tell me about my fertility?
- Does insurance cover it?

Overview

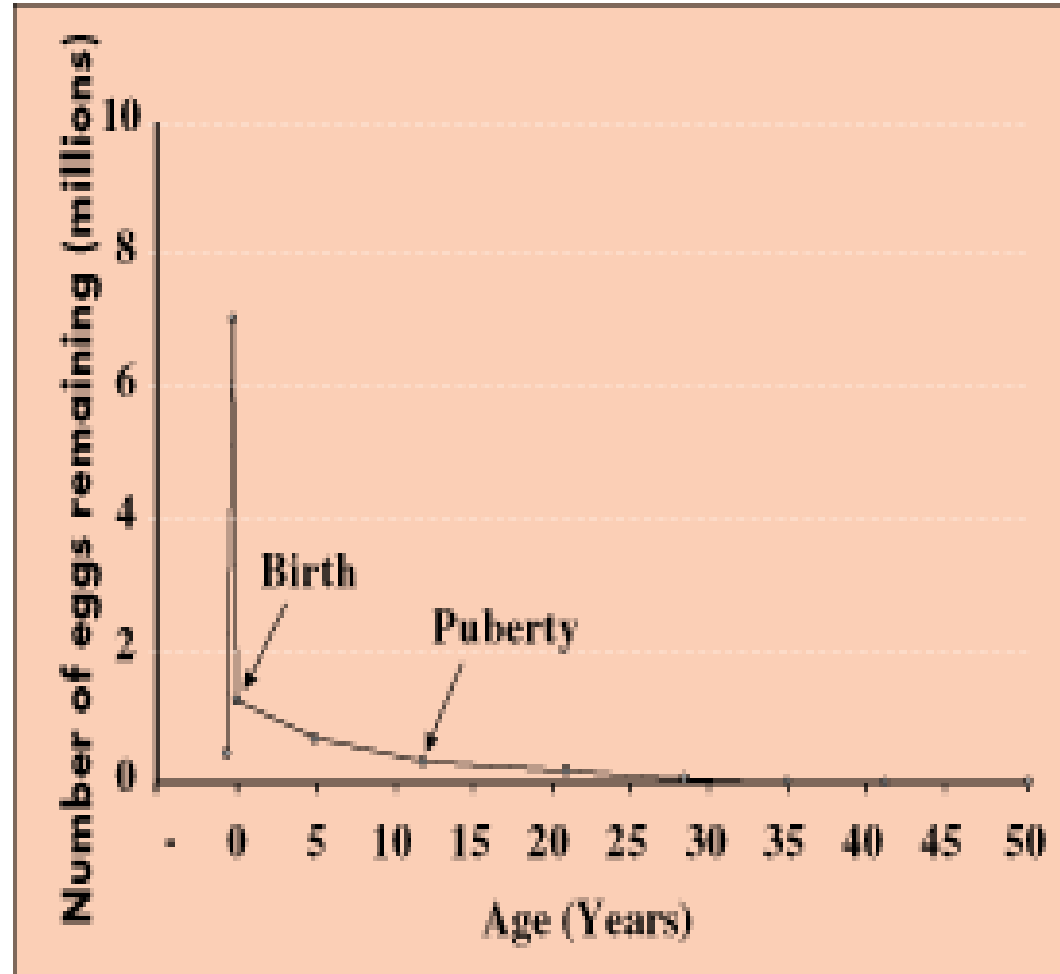
- Age and fertility
- Other factors and effect on fertility
- The process of IVF/egg freezing
 - Stimulation of ovaries
 - Egg retrieval
 - Egg freezing, thawing, fertilization and embryo transfer
- Success with egg freezing
- Ovarian function and AMH

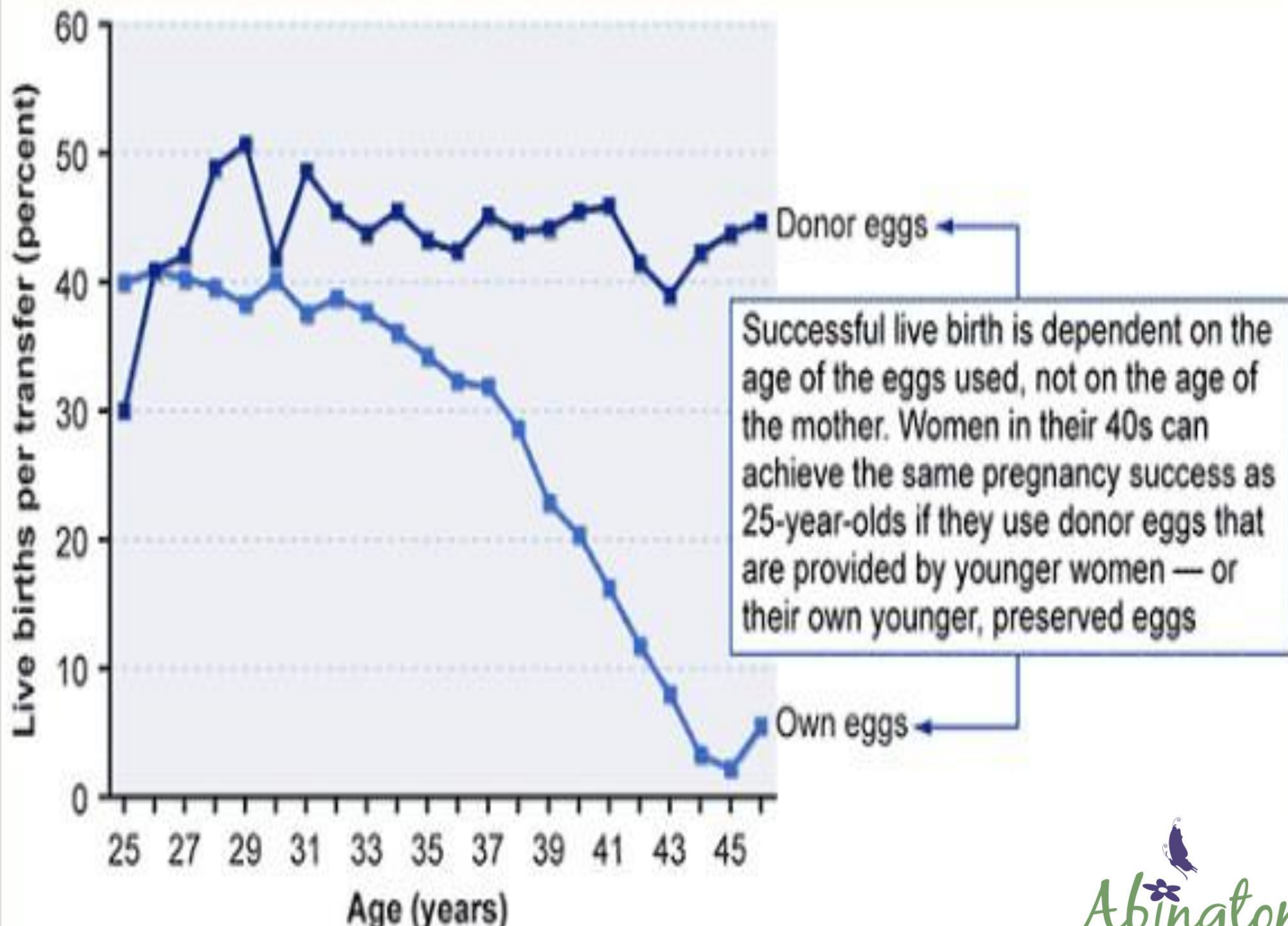
Age & Fertility



You are born with your eggs

- Eggs are depleted
- Fetal: 6-7 million
- Birth: 1-2 million
- Puberty: 300,000
- Menopause: None





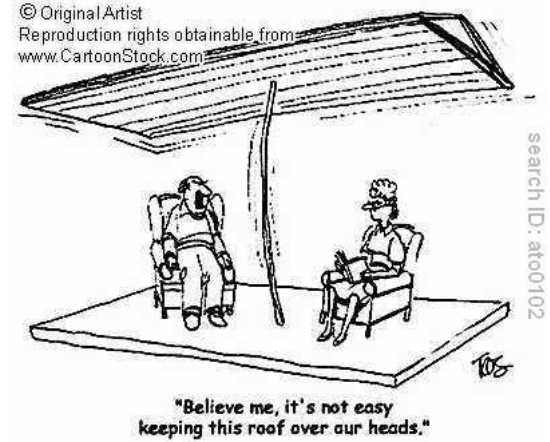
Current Trends in Childbearing

- 1980-2010 the number of women 35-45 years old increased from 13 million to 18.5 million
- Delay in childbearing into the 30' s increased from 7% (1970) to 15% (1982) to 20% by 2010

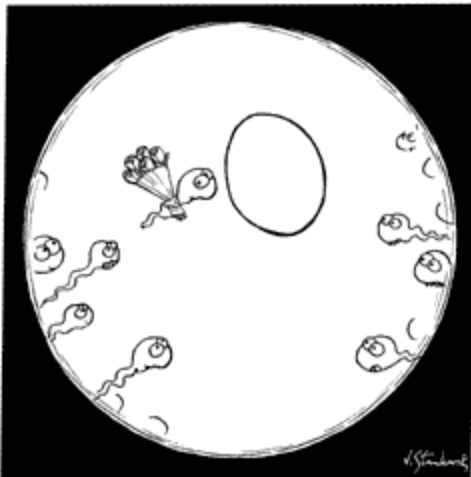
Declining Birth Rates and Fertility



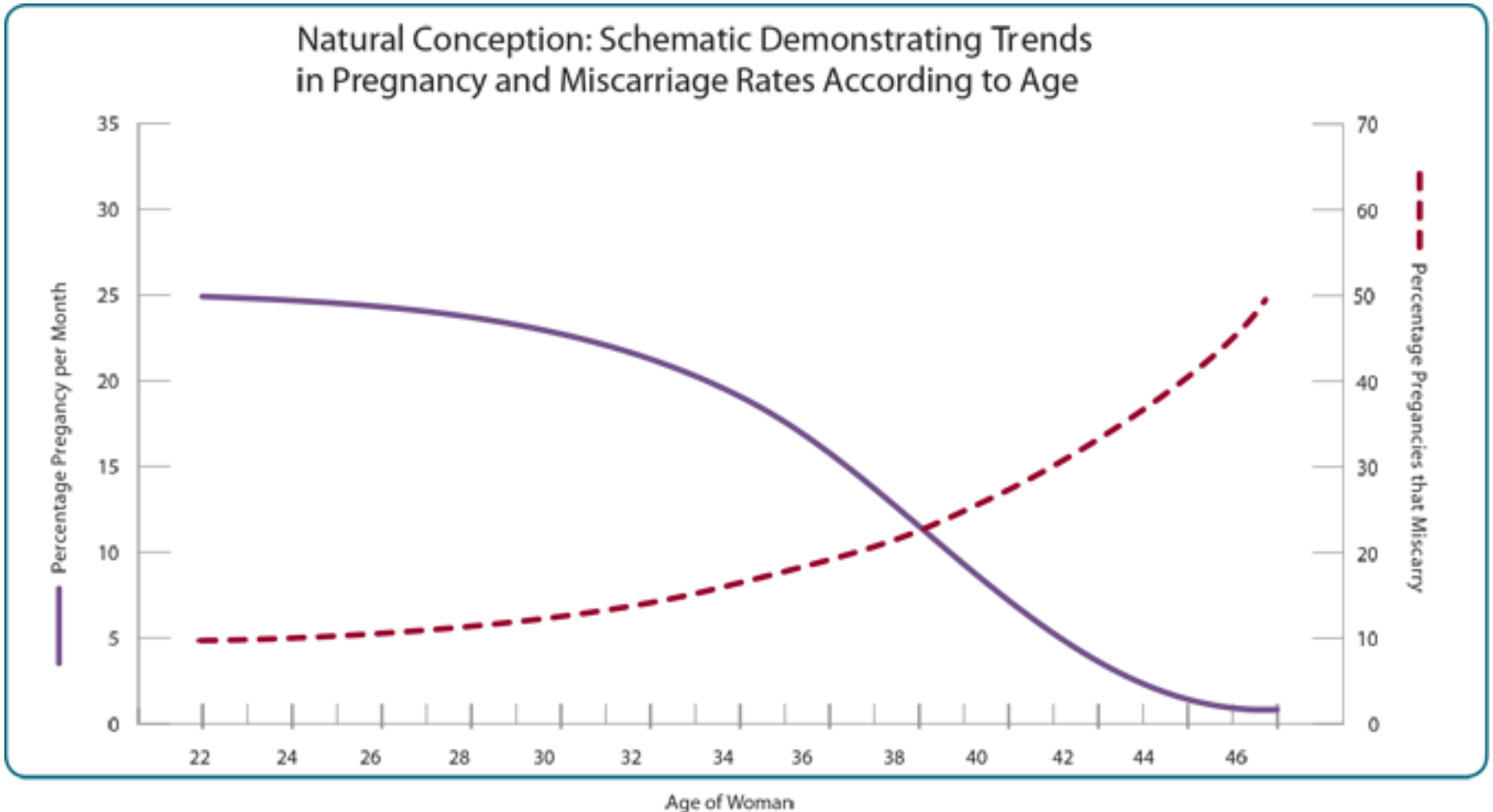
Societal Changes



Sperm constantly being produced



Pregnancy & Miscarriage (Based on Age)



Age & Fertility

Table 2. Risk of Chromosomal Abnormality in Newborns by Maternal Age

<i>Maternal Age (years)</i>	<i>Risk for Down Syndrome</i>	<i>Total Risk for Chromosomal Abnormalities</i>
20	1/1,667	1/526
25	1/1,250	1/476
30	1/952	1/385
35	1/378	1/192
40	1/106	1/66
41	1/82	1/53
42	1/63	1/42
43	1/49	1/33
44	1/38	1/26
45	1/30	1/21
46	1/23	1/16
47	1/18	1/13
48	1/14	1/10
49	1/11	1/8

Source: *Maternal Fetal Medicine: Practice and Principles*. Creasy and Resnick, eds. W.B. Saunders, Philadelphia, PA. 1994:71. Reproduced with permission.

Other effects on fertility

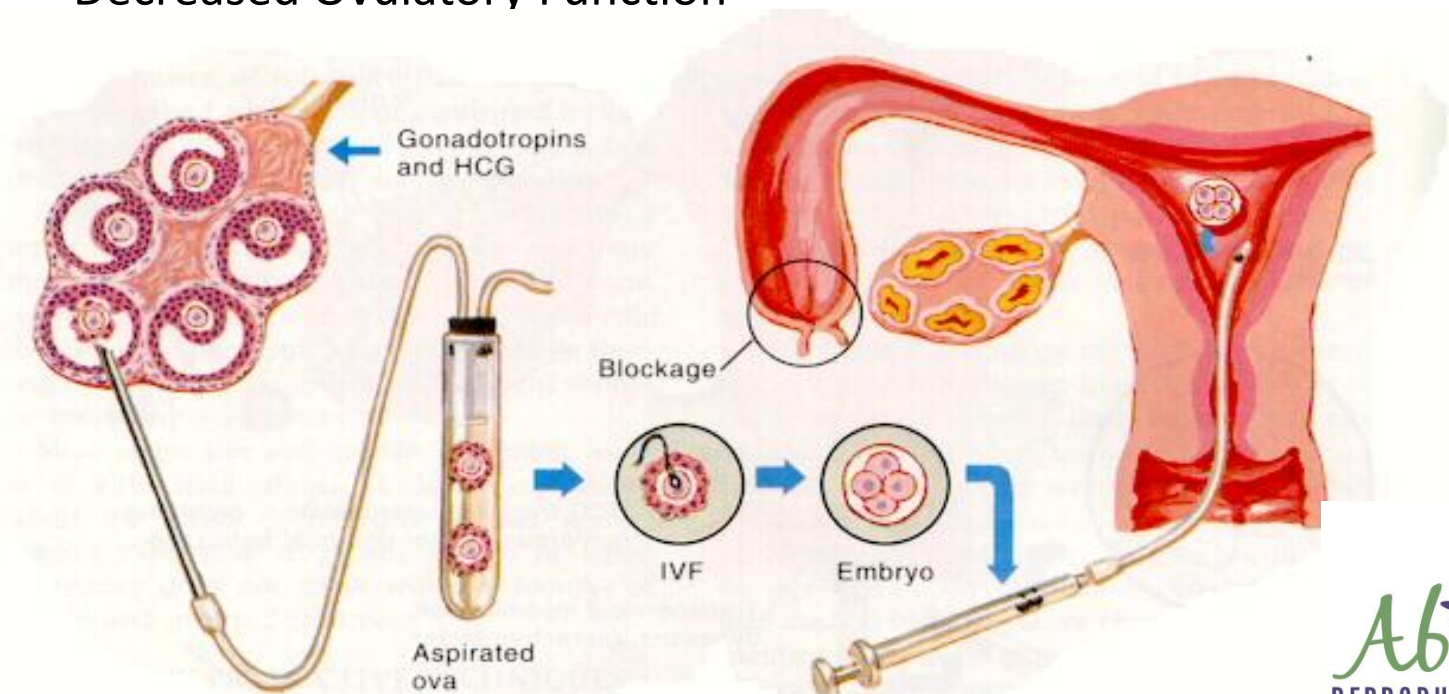
- PCOS - Lack of normal ovulation
 - Ovulation induction
 - Oral medication OR injectable medication
 - IVF
 - In group of patients with other co-existing causes of infertility
 - Decrease possible multiple pregnancy rates with ovarian stimulation
- Male factor (sperm)
- Tubal factor
- Uterine factor

Evaluating Infertility

Clinical Need	Routine Tests
Ovarian Reserve	<ul style="list-style-type: none">• Day 3 FSH and estradiol testing• AMH• Antral follicle count
Uterine Factors	<ul style="list-style-type: none">• Ultrasound scanning• Hysteroscopy• Hysterosalpingography (HSG)
Tubal Factors	<ul style="list-style-type: none">• Hysterosalpingography (HSG)• Laparoscopy chromotubation
Male Factor	<ul style="list-style-type: none">• Semen analysis

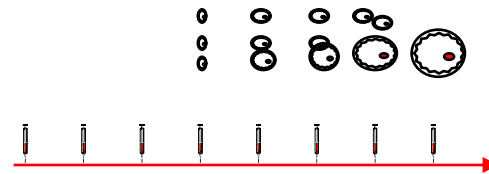
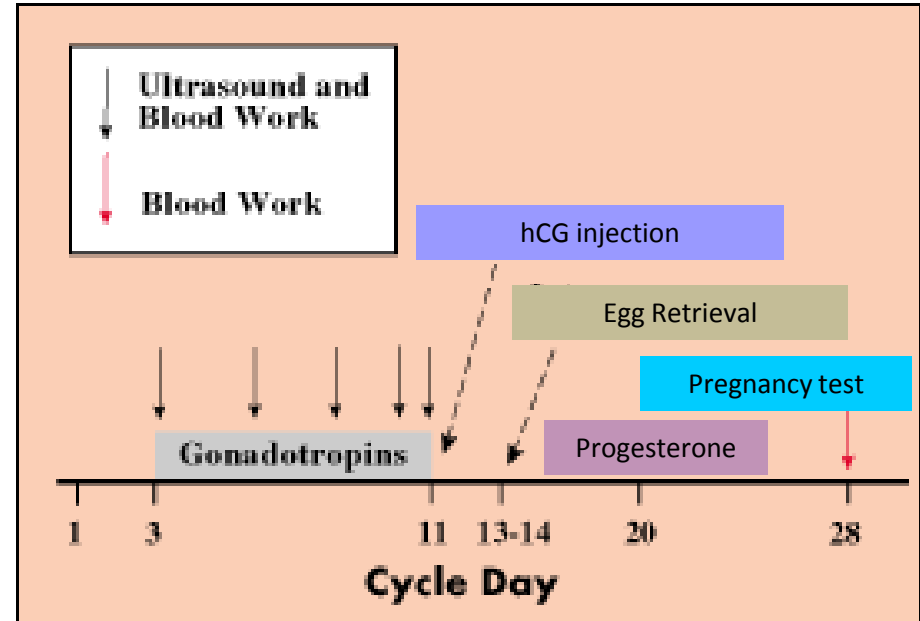
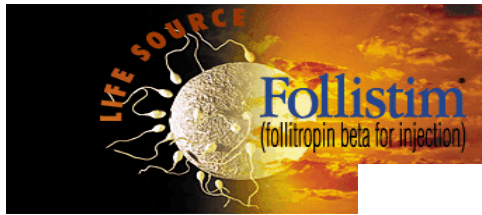
In Vitro Fertilization (IVF) – And Process of Ovarian Stimulation for Egg Freezing

- Indications for IVF
 - Tubal Disease
 - Severe endometriosis
 - Male Infertility Factor
 - Unexplained Infertility/Advanced Age
 - Decreased Ovulatory Function

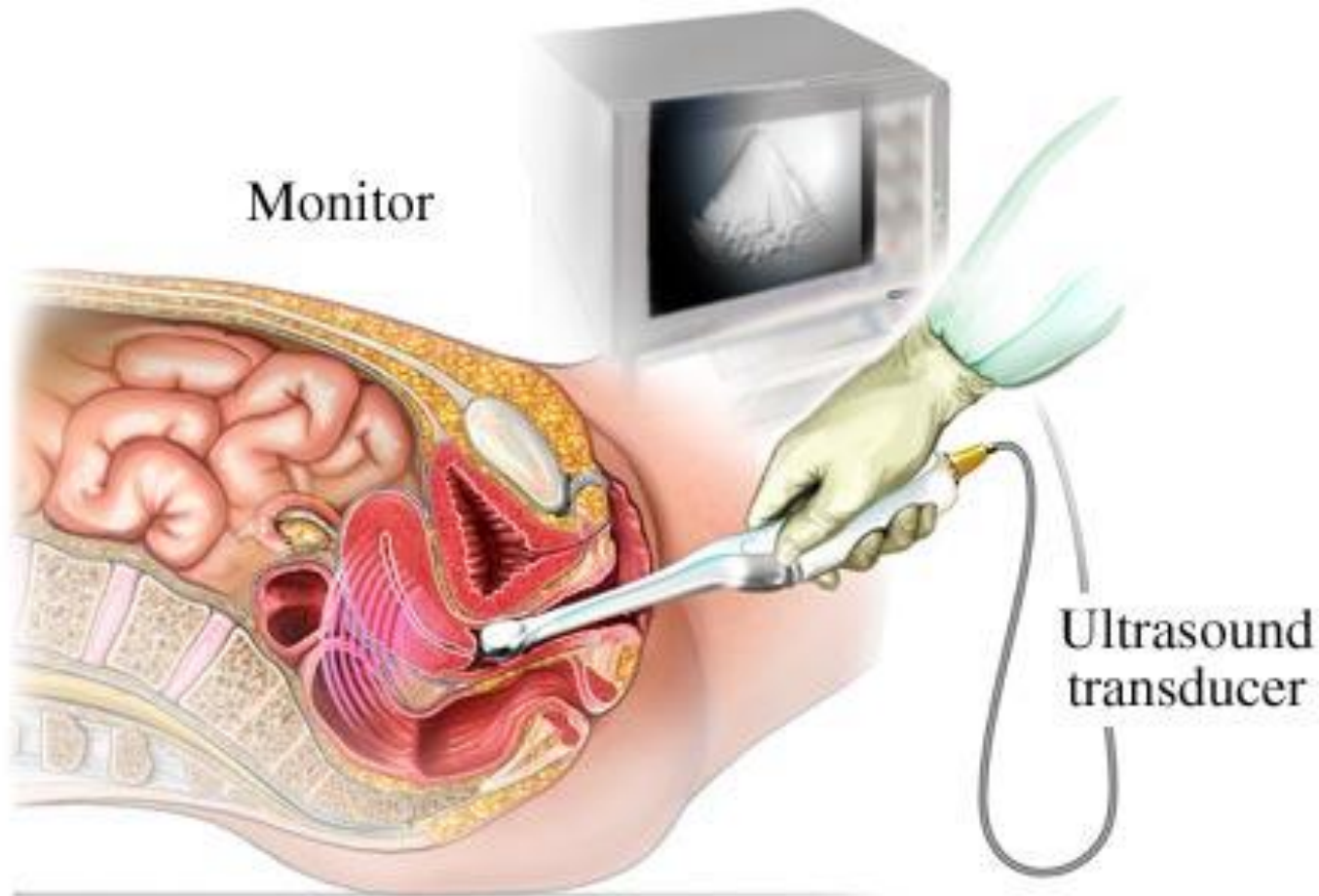


Ovulation Induction Procedure

Injectable medications



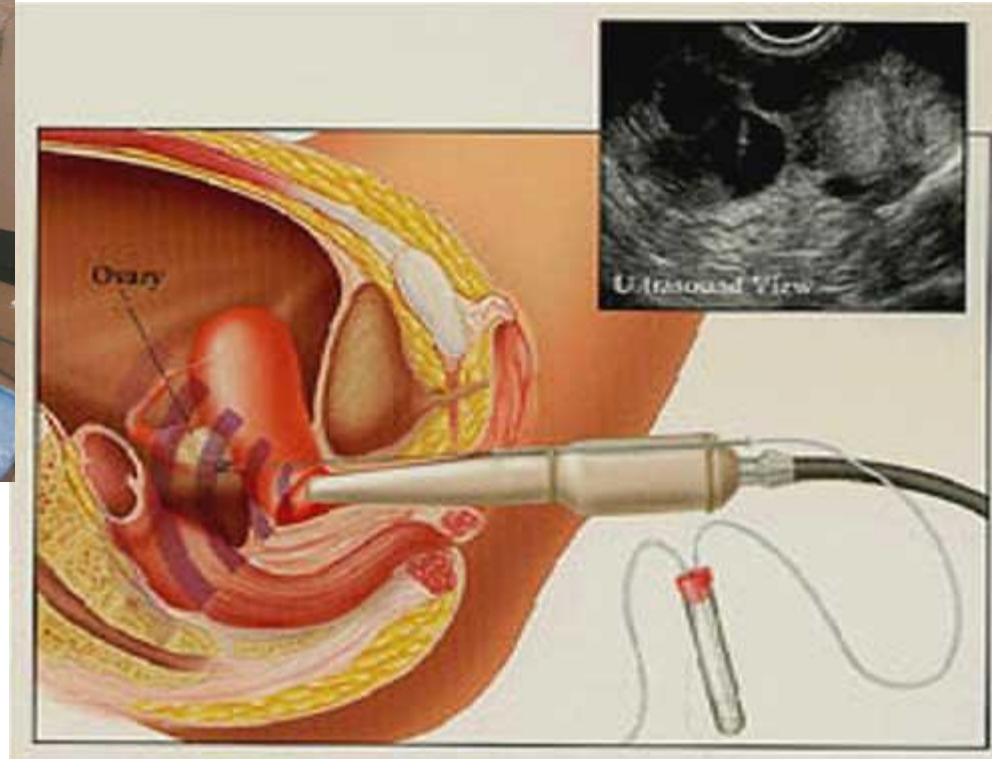
Transvaginal Ultrasound



Ovarian Stimulation



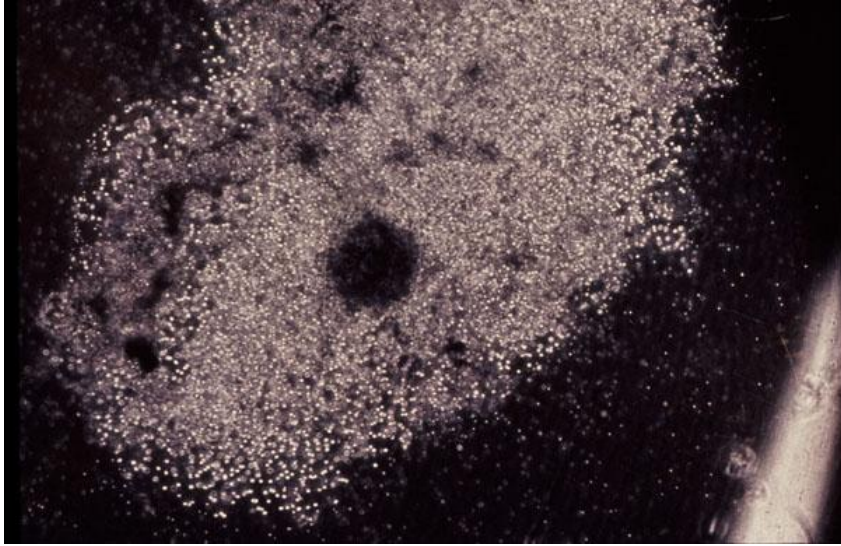
Oocyte (Egg) Retrieval



In Search of the Oocyte



Oocyte



Oocyte Cryopreservation (Egg Freezing)



Oocyte cryopreservation (Egg Freezing)

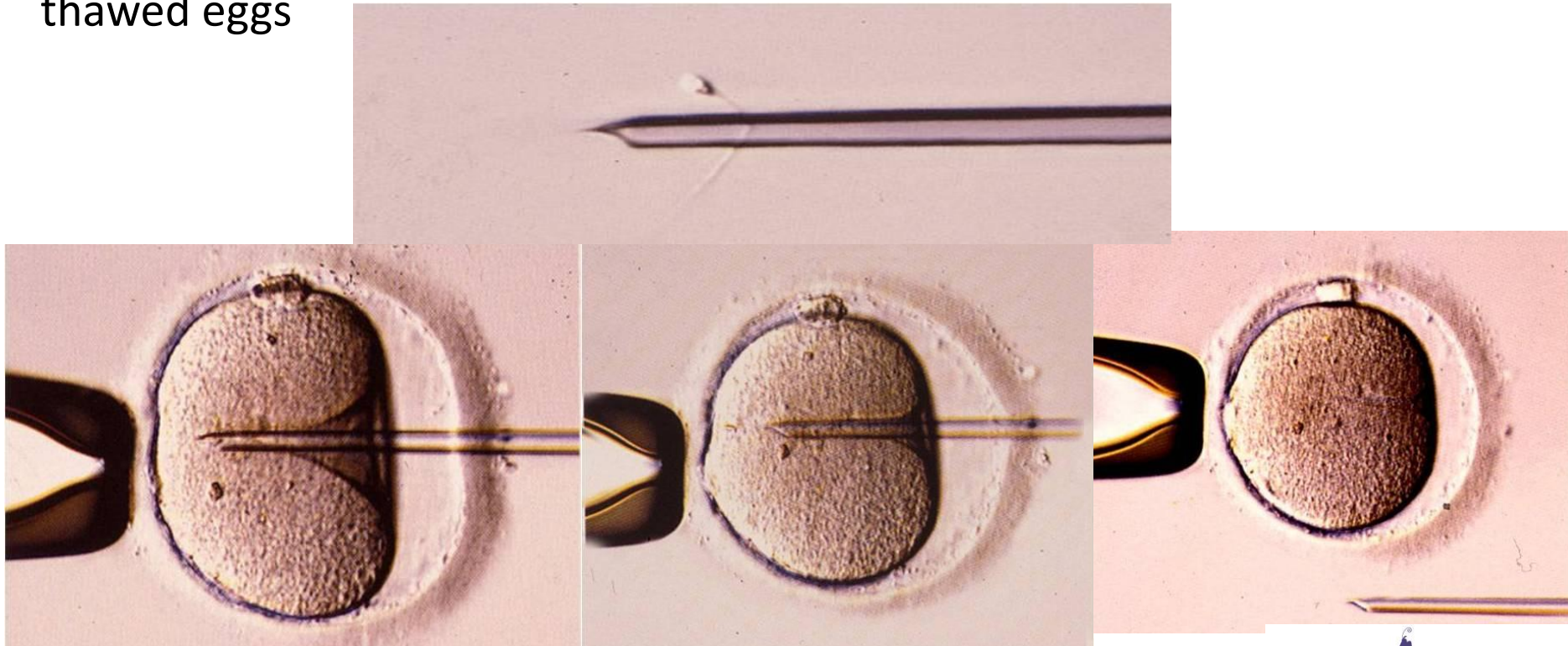
- Before 2012—considered experimental
 - Use for young cancer patients, patients with imminent ovarian failure
- Methods of freezing an egg
 - Slow Freezing vs. Vitrification technique
- 2012 – American Society for Reproductive Medicine took off the experimental label

Oocyte cryopreservation (Egg Freezing)

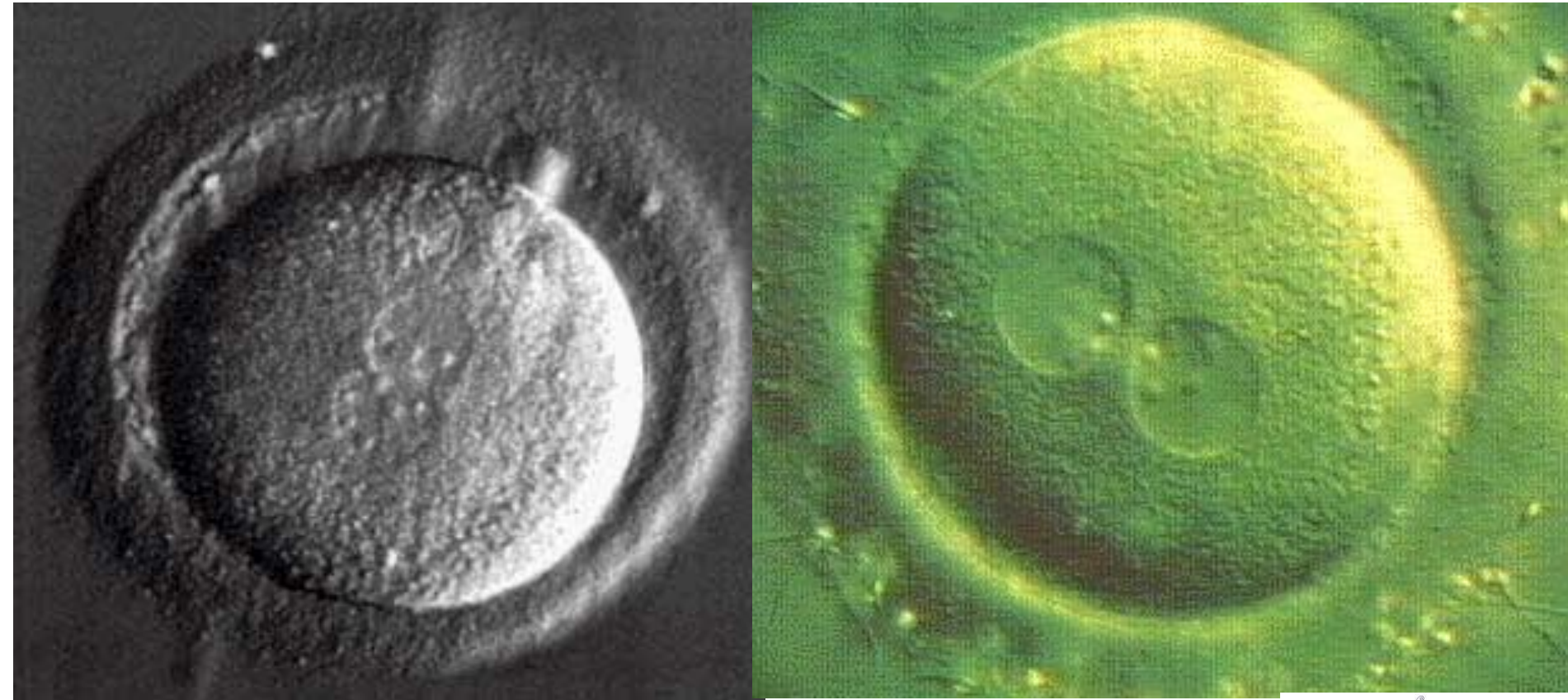
- Similar rates of fertilization and pregnancy with frozen compared to fresh eggs
- Egg freezing can be done for many reasons
- No increased risk of congenital anomalies or genetic abnormalities using frozen eggs

ICSI (Intracytoplasmic Sperm Injection)

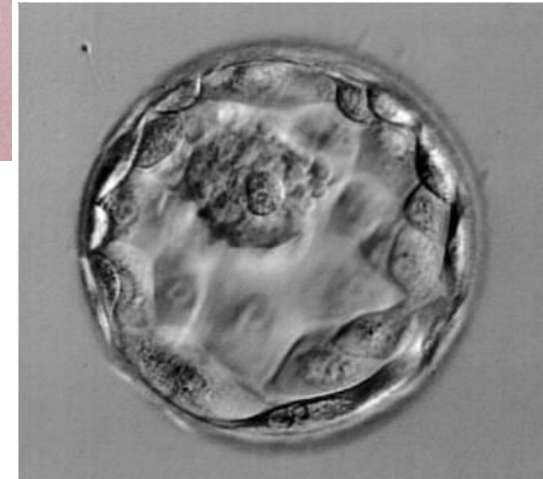
- Traditionally, treatment for male factor infertility
- Due to hardening of 'shell' of egg, ICSI recommended when using frozen-thawed eggs



Fertilization



Embryo cleavage (growth)



- Great predictability of implantation
- Decreased multiple rates

The Embryo Transfer

Number of Embryos to transfer

Age	Day 3 Transfer	Day 5 Transfer
< 35	1-2	1
35-37	2	2
38-40	3	2
> 40	5	3



If multiple failed prior cycles and less favorable prognosis additional embryos may be transferred

What is the success of egg freezing?

- 90% survival of frozen eggs that are thawed
- 75% fertilization rate
- Pregnancy rates depends on **age** when eggs are frozen...

Oocyte cryopreservation (Egg Freezing)

<http://www.i-fertility.net/probability-calc>

Freezing Method Vitrification Slow Freezing

Patient's Age at Freezing

Number of Oocytes

Livebirth Probability %

Calculate

- Based on the number of eggs frozen (Thawed)
- Based on the number of thawed eggs injected with sperm
- Based on the number of embryos transferred

Comparing success based on age and number of eggs frozen/thawed:

10 eggs frozen/thawed:

Age when froze	28	35	40
Probability of a live birth	29.9%	20.5%	15.3%

VS.

20 eggs frozen/thawed:

Age when froze	28	35	40
Probability of a live birth	38.5%	27.4%	20.9%

Testing 'Ovarian Reserve'

- **Blood Tests:**

- Day 3 Follicle Stimulating Hormone (FSH)/
Estradiol
- Anti-Mullerian Hormone (AMH)

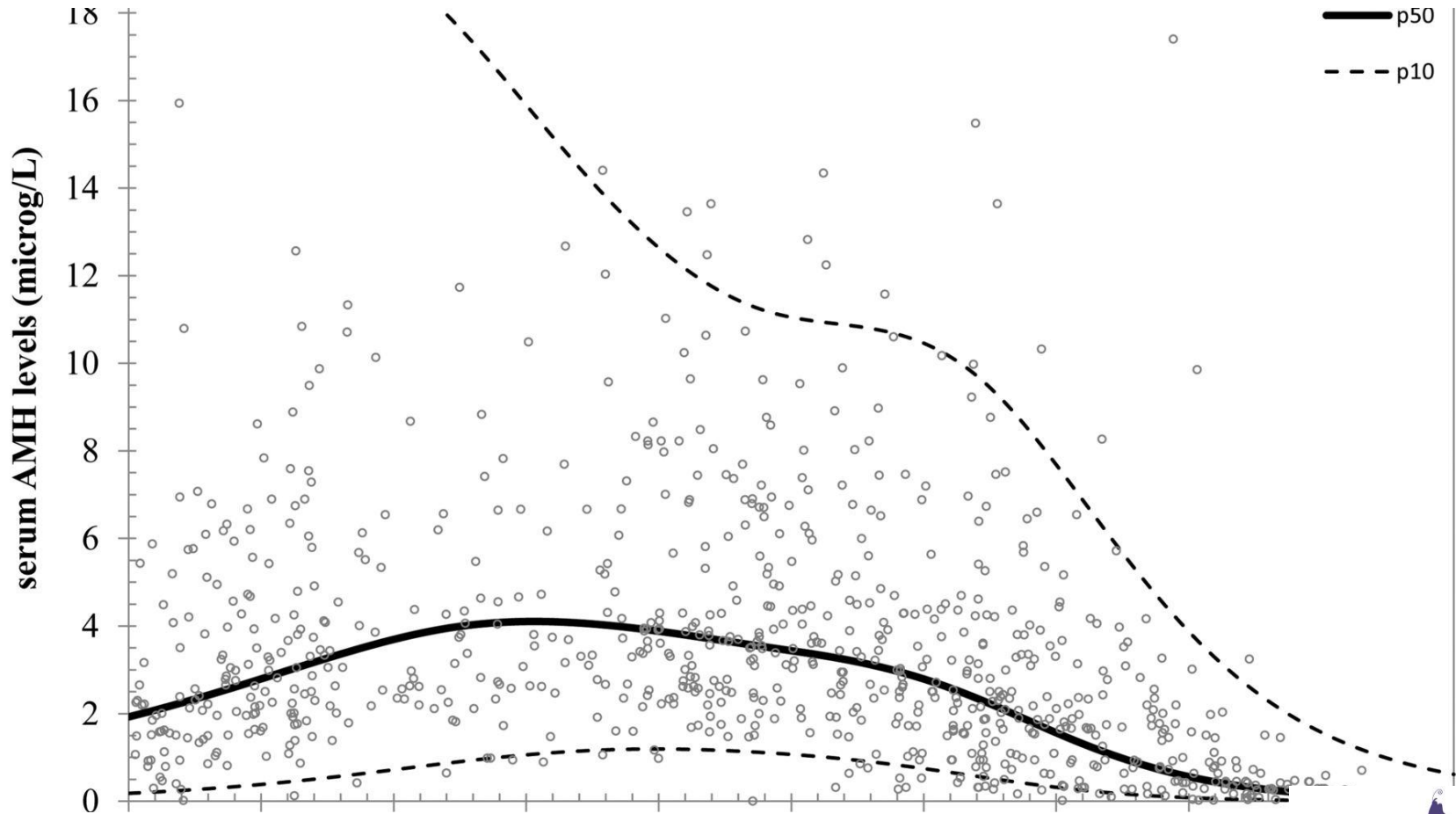
- **Ultrasound:**

- Antral Follicle Count (AFC)

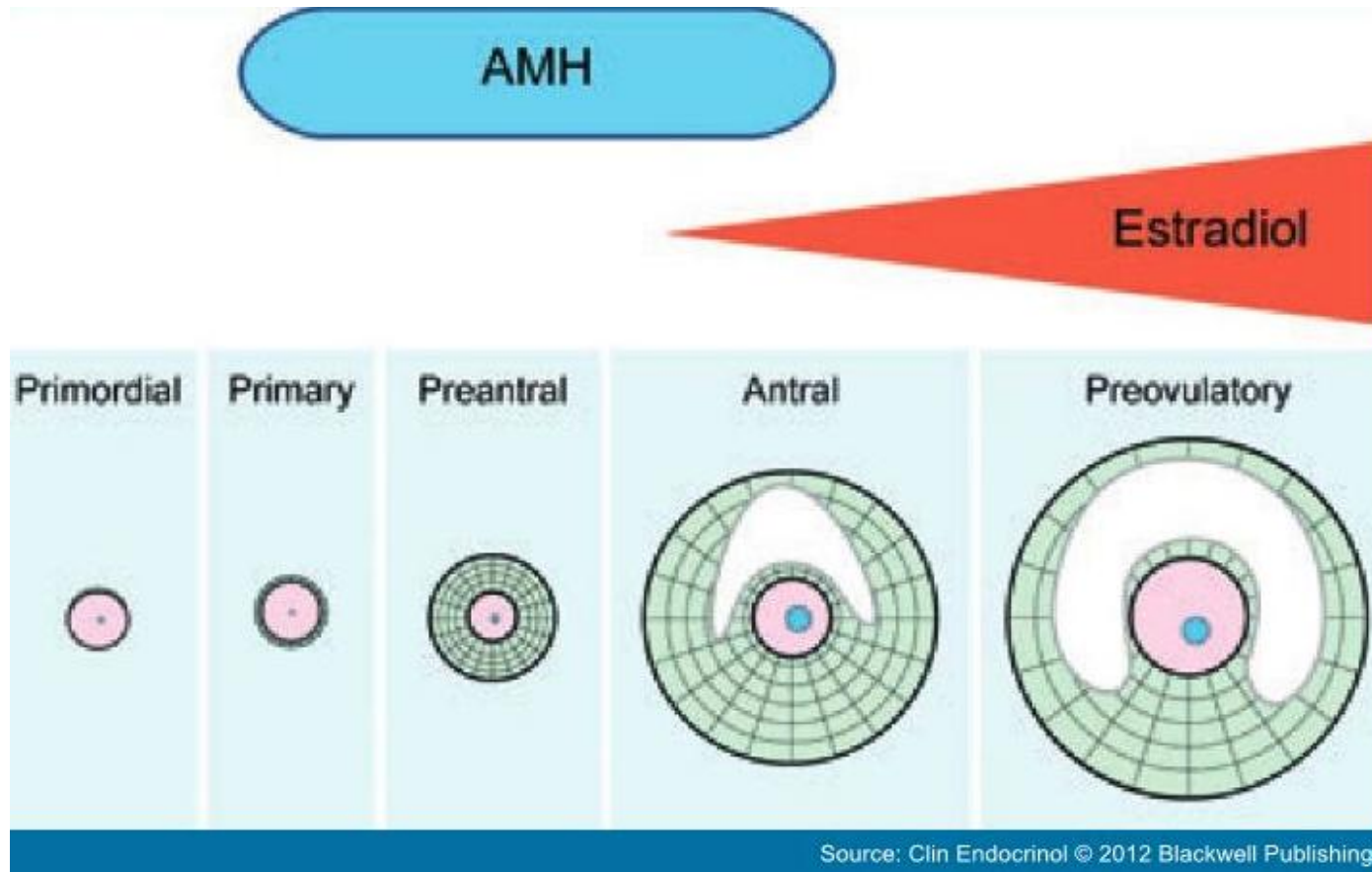
Anti-Mullerian Hormone (AMH)

- Hormone that is made in the ovaries
- Measured in the blood, at any time during the menstrual cycle
- > 1 ng/ml = normal ovarian reserve
- < 1 ng/ml = decreased ovarian reserve
- Levels decline with increasing age

Anti-Mullerian Hormone (AMH)



Anti-Mullerian Hormone (AMH)



AMH and PCOS

- AMH ~ 5 ng/ml as part of the criteria for diagnosing PCOS
- Higher AMH, number of preantral and antral follicles
- ‘Increased’ ovarian reserve – or pool of eggs
 - ? start out with more eggs at birth
 - ? or decreased rate of ‘losing eggs’ throughout life
- Higher number of eggs obtained in IVF
- Higher number of embryos available for freezing
- Likely no advantage over age of 40 in terms of pregnancy rates

Conclusions

- Women with PCOS do well in terms of pregnancy rates
- Age is one of the most important factors in fertility and the decline of fertility
- Egg freezing may be an option in the right candidate

Information overload

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THANK YOU

Questions?