

# تشخیص و ارجاع بیماران ناباروری

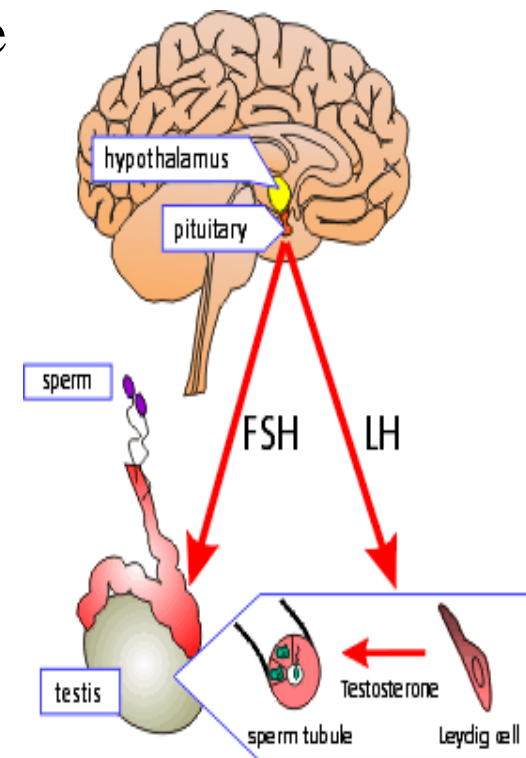
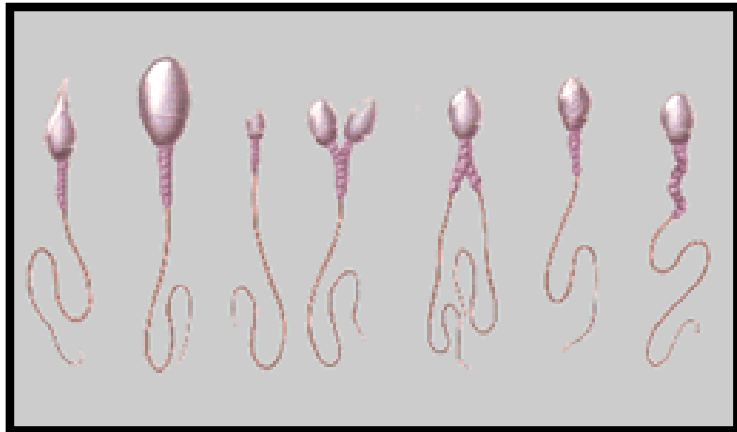


دکتر زهرا مصلی نژاد  
جراح و متخصص زنان زایمان  
فلوشیپ درمان های ناباروری  
استادیار دانشگاه علوم پزشکی جهرم

# Male sperm production

We now recognize that abnormalities in the male are the sole cause of infertility in approximately **20% of infertile couples**

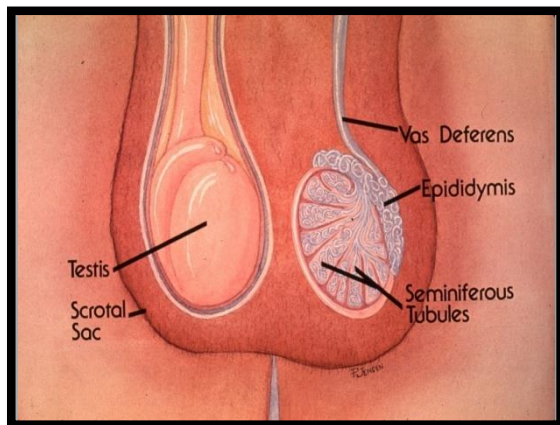
Continued proliferation during adult life supports the production of approximately 100–200 million sperms each day



# Male sperm production

The spermatogenic process is directed by genes located on the Y chromosome and takes approximately **70 days to complete from the spermatocyte stage.**

Another 12–21 days are required for the transport of sperms from the testis through the epididymis to the ejaculatory duct



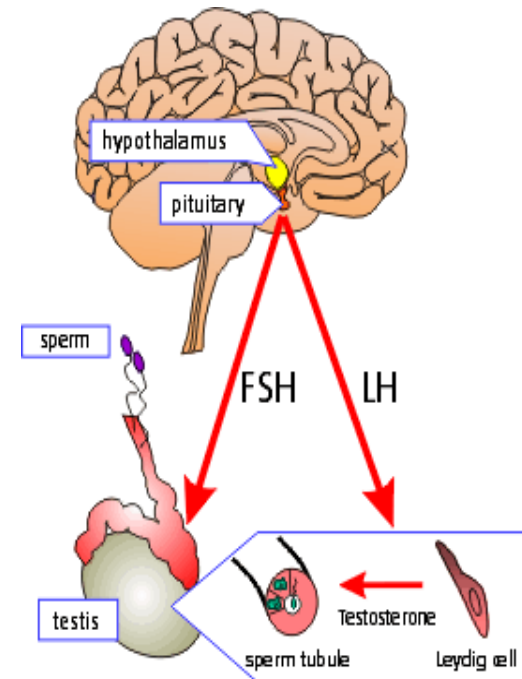
During passage through the **epididymis**, sperms mature further to develop the capacity for **sustained motility**

**The long time required for sperm development and transit implies that the results of a semen analysis reflect conditions existing many weeks earlier**

Final maturation, or capacitation, of sperms may occur after ejaculation into the female genital tract

Normal testicular function requires the actions of both pituitary gonadotropins, folliclestimulating hormone (FSH) and luteinizing hormone (LH). LH stimulates the Leydig cells in the testicular interstitium to synthesize and secrete testosterone (approximately 5–10 mg/day).

In men with hypogonadotropic hypogonadism of prepubertal onset, normal spermatogenesis can be stimulated by combined treatment with human chorionic gonadotropins (hCG, having potent LH-like actions) and human menopausal gonadotropin (containing FSH),



# Female reproductive tract

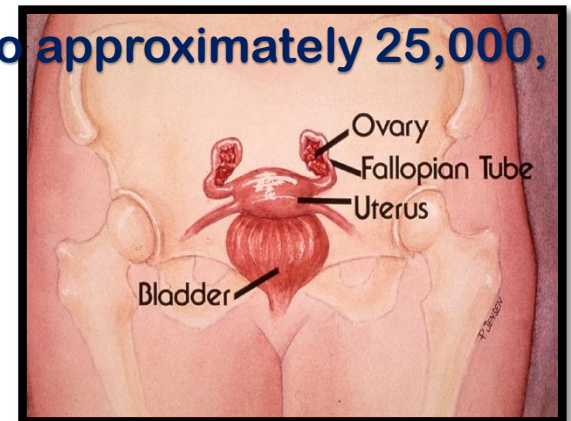
In humans, the number of oocytes peaks around **the 20th week of gestation when approximately 6–7 million oocytes** arrested at the first meiotic prophase are found in the ovarian cortex.

Afterward, regulated apoptosis starts an irreversible decline in the germ cell population.

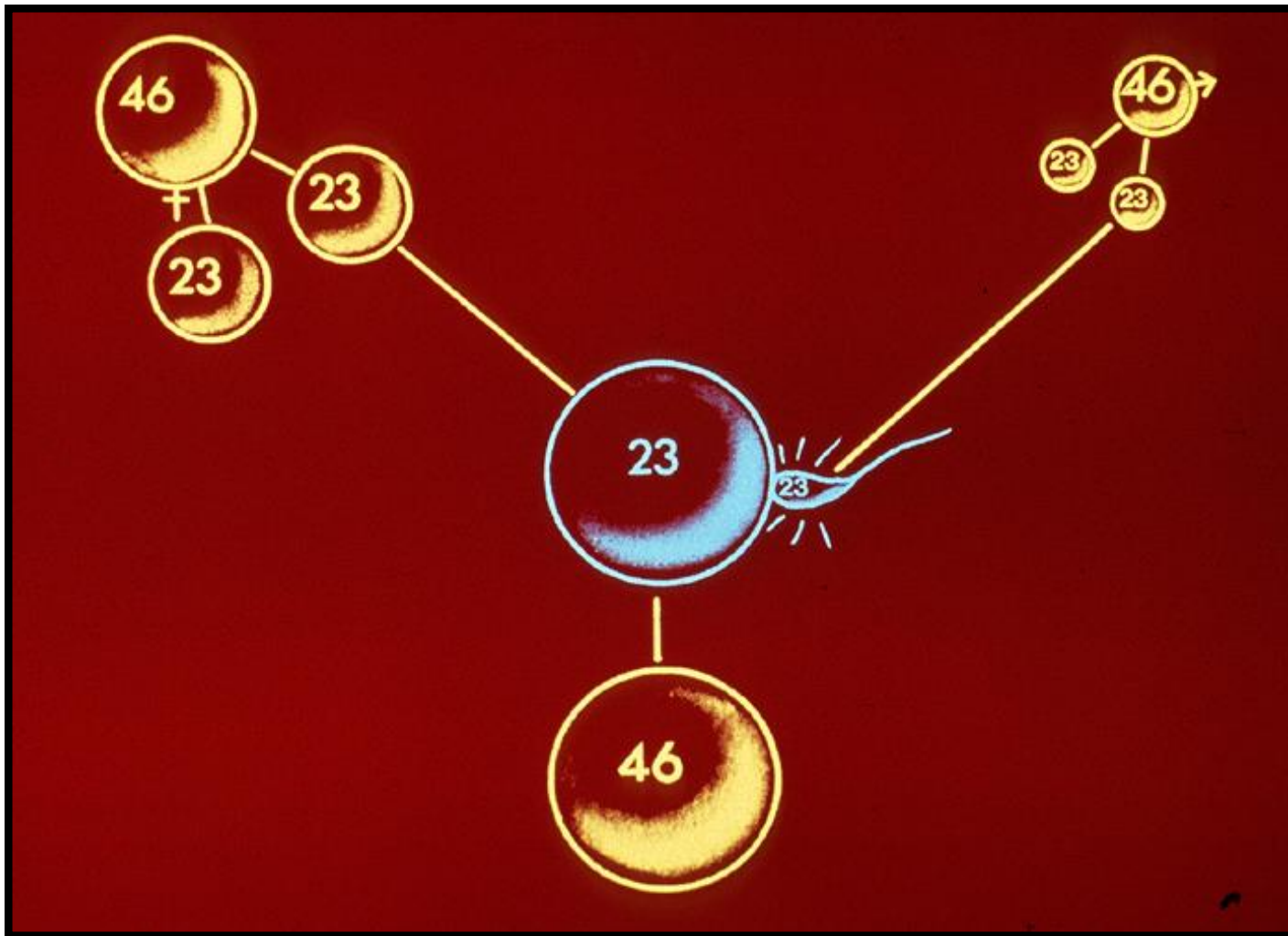
**The number of oocytes declines to 1–2 million at birth** and to 300,000–400,000 by puberty.

Over the next 35–40 years of reproductive life, only about 400 oocytes will ovulate, the rest being lost through atresia.

**By age 40, the number of follicles shrinks to approximately 25,000, and at menopause, there remains less than 1,000 follicle**

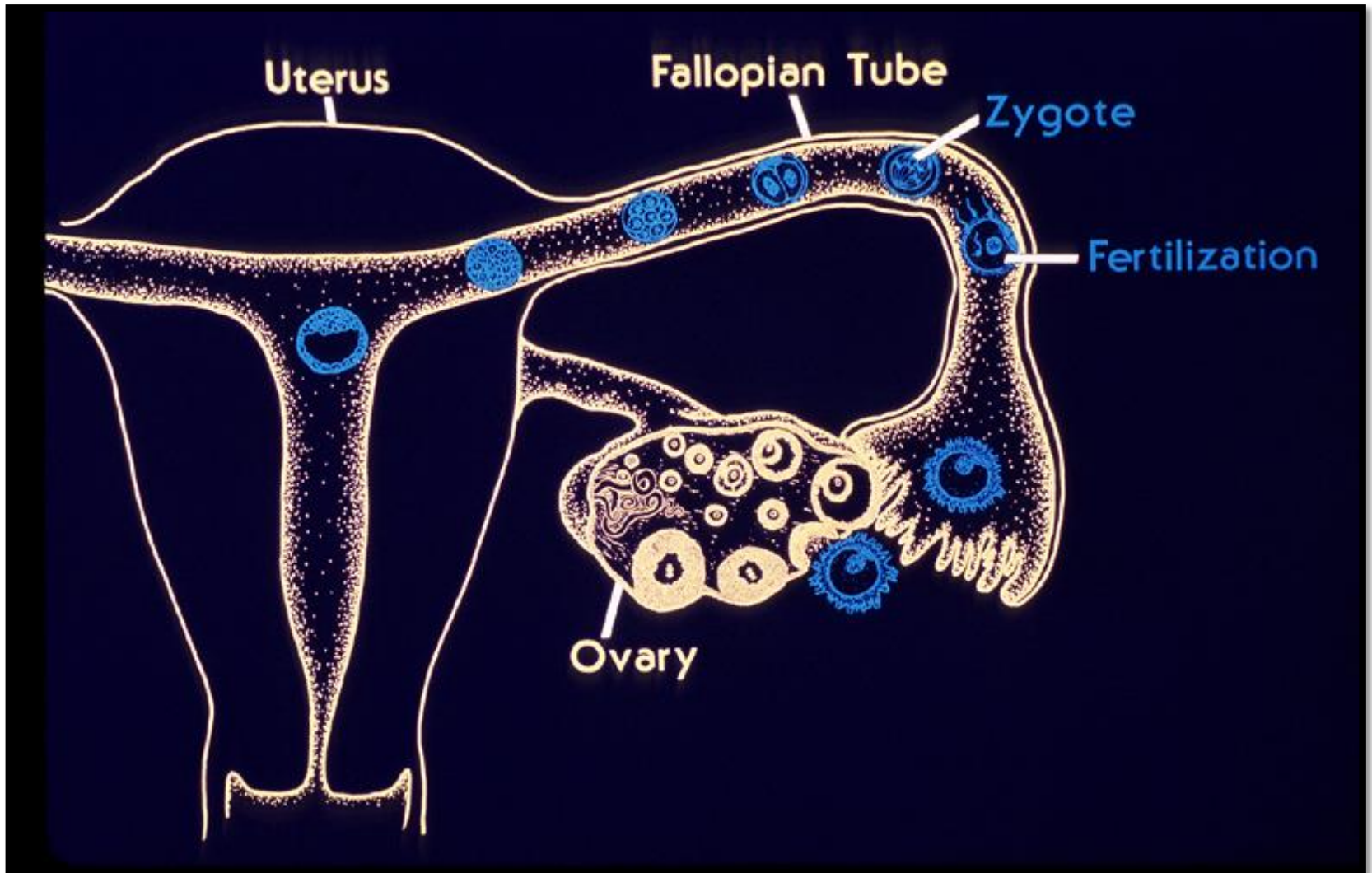


# Fertilization: sperm meets egg





# Implantation





# Key Points: Human Reproductive Process

- Sperm must be deposited at or near the cervix at or near the time of ovulation, ascend into the fallopian tubes, and have the capacity to fertilize the oocyte (male factor).
- Ovulation of a mature oocyte must occur, ideally on a regular and predictable basis (ovarian factor).
- The fallopian tubes must capture ovulated ova and effectively transport sperm and embryos (tubal factor).
- The uterus must be receptive to embryo implantation and capable of supporting subsequent normal growth and development (uterine factor).

# Infertility

- Definition:
  - The inability of a sexually active couple, not using any contraception, to conceive during 1 year (age  $< 35$ ) or 6 months (age  $> 35$ )



# Infertility

## ❖ Fecund ability:

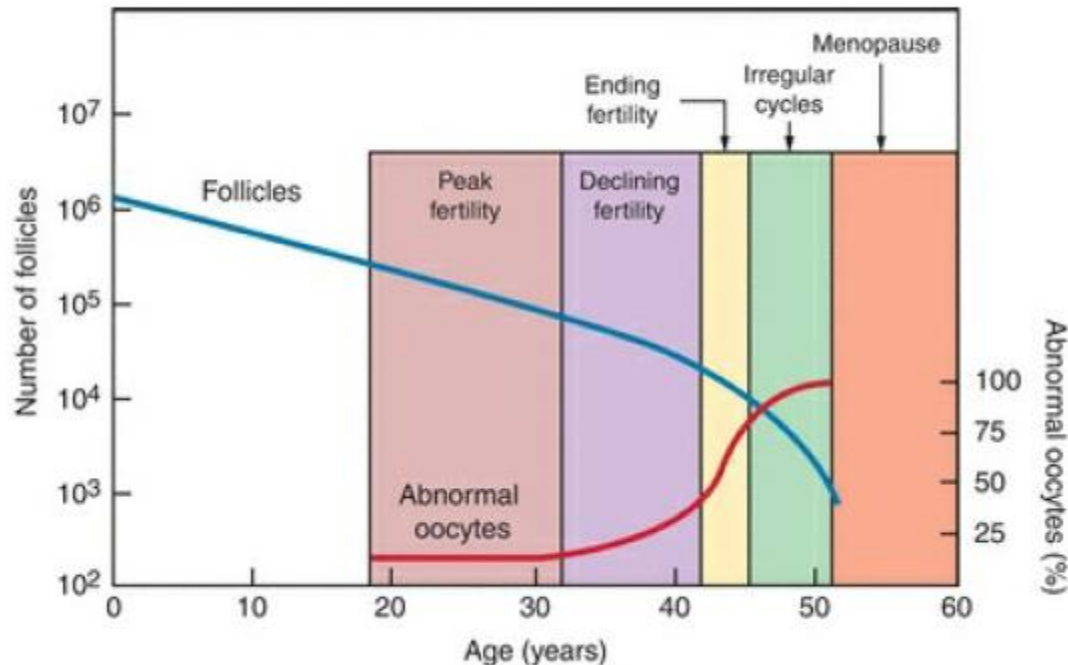
- is the chance of conception in one menstrual cycle (15-25%)

## ❖ Incidence increases with age



**.Initiate evaluation less than six months of unprotected and frequent intercourse:**

- Women **over 40 years** of age.
- Women with **oligomenorrhea/amenorrhea**.
- Women with a history of **chemotherapy, radiation therapy, or advanced stage endometriosis**.
- Women with **known or suspected uterine/tubal disease**.
- Male partner has a history **of testicular surgery, adult mumps, impotence or other sexual dysfunction, chemotherapy and/or radiation**



Adapted from<sup>17, 156</sup>

**Live birth rates in donor egg IVF cycles relate to the age of the donor, not the age of the recipient**

# Infertility

- **Primary infertility**
  - a couple that has never conceived
- **Secondary infertility**
  - infertility that occurs after previous pregnancy regardless of outcome

# Lifestyle and Environmental Factors

- Obesity is defined as a body mass index (BMI) greater than 30 kg/m<sup>2</sup> and overweight is defined as a BMI between **25 kg/m<sup>2</sup>** and 30 kg/m<sup>2</sup>.
- In women, obesity is associated with menstrual dysfunction, decreased fertility, and increased risks of miscarriage and obstetric and neonatal complications.
- In men, obesity is associated with abnormal semen parameters and can adversely affect fertility.

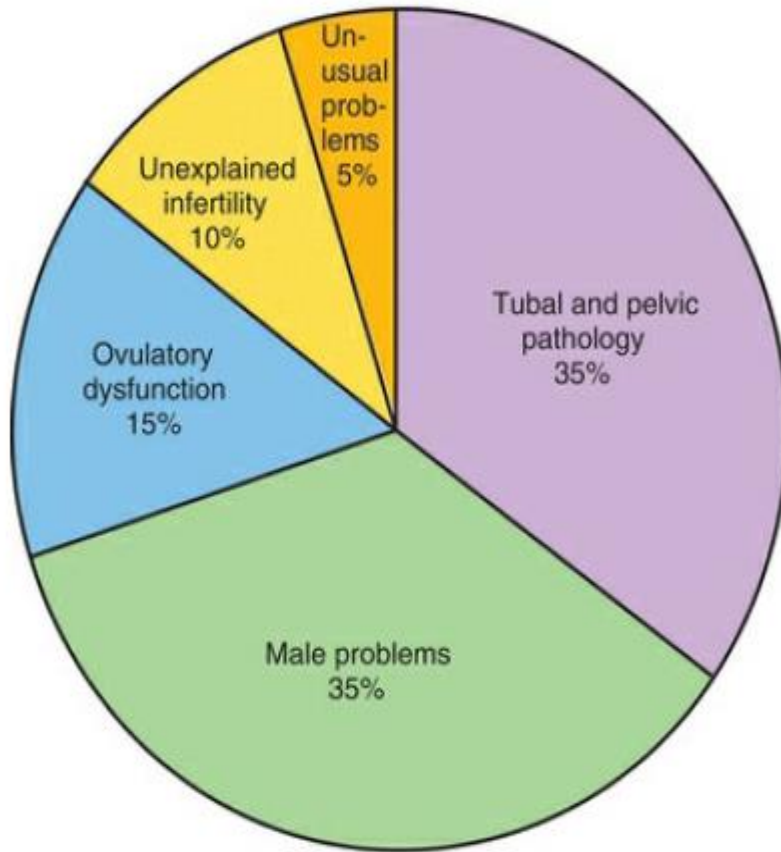


- **Substance abuse** is one of the few things over which the couple may have specific control, smoking being the most important

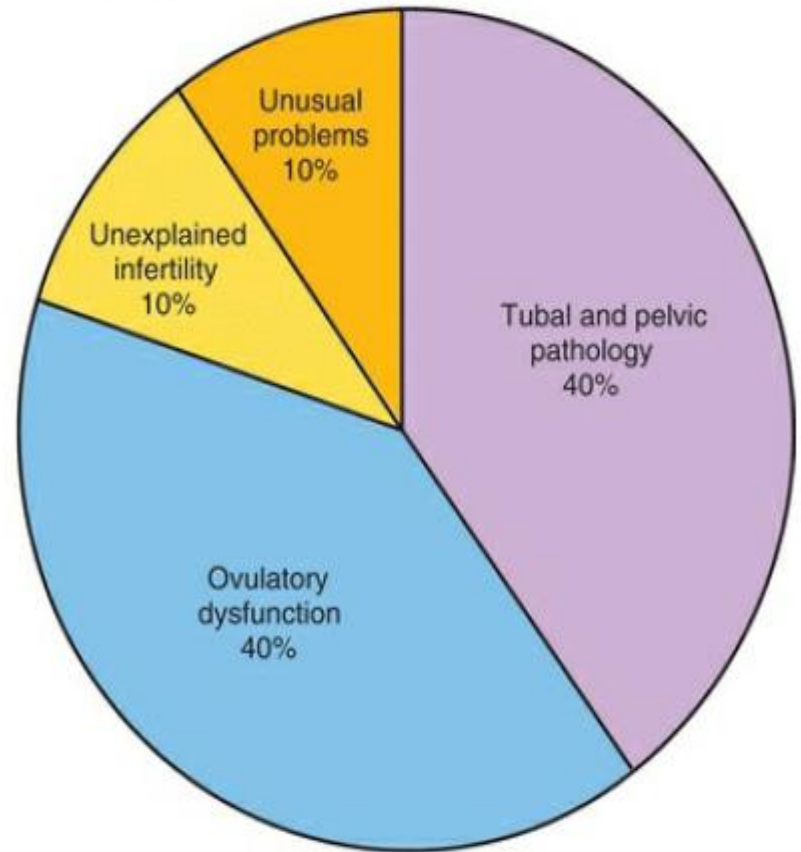
Although moderate **caffeine ingestion (200 mg daily, which is equal to about one 12-ounce cup of coffee)** appears not to have any adverse effects on fertility, higher levels of consumption may delay conception

- Other **potentially harmful occupational and environmental exposures**, although uncommon, may be identified. Exposures to perchlorethylene in the **dry-cleaning industry**, **toluene in the printing business**, **ethylene oxide**, and mixed solvents have been associated with decreased fecundity.
- Semen abnormalities have been described in men exposed to radiant heat or heavy metals

## Causes of Infertility



Couples



Women

# The Causes of Infertility and their Approximate Frequency

Causes	Frequency %
Sperm defects or dysfunction	30
Ovulation failure ( <i>amenorrhoea or oligomenorrhoea</i> )	25
Tubal infective damage	20
Unexplained infertility	25
Endometriosis ( <i>causing damage</i> )	5
Coital failure or infrequency	5
Cervical mucus defects or dysfunction	3
Uterine abnormalities ( <i>eg fibroids or abnormalities of shape</i> )	1
<i>15% of couples have more than one sub-fertility factor</i>	

# Workup



❖ History is KEY

❖ Focused Physical Exam

❖ Labs and Specialized Tests

## History

- Obstetric history including gravidity, parity, pregnancy outcomes, and associated complications.
- Menstrual history including cycle length and characteristics and onset and severity of dysmenorrhea.
- Coital frequency and sexual dysfunction.
- Duration of infertility and results of any previous evaluation and treatment.
- Medical and surgical history, including episodes of pelvic inflammatory disease or exposure to sexually transmitted infections.
- Previous abnormal cervical cancer screening results and subsequent treatment.
- Current medications and allergies.
- Occupation and use of tobacco, alcohol, and other drugs.
- Family history of birth defects, mental retardation, early menopause, or reproductive failure.
- Symptoms of thyroid disease, pelvic or abdominal pain, galactorrhea, hirsutism, or dyspareunia.

## **Physical Examination**

- Weight and BMI.
- Thyroid enlargement, nodule, or tenderness.
- Breast secretions and their characteristics.
- Signs of androgen excess.
- Pelvic or abdominal tenderness, organ enlargement, or mass.
- Uterine size, contour, position, and mobility.
- Vaginal or cervical abnormality, secretions, or discharge.
- Mass, tenderness, or nodularity in the adnexa or cul-de-sac.



# SCREENING TESTS

- Pap smear screening is recommended for all sexually-active women of reproductive age who have a cervix.
- A blood type, Rh factor, and antibody screening (in Rh-negative women) also are recommended, if not already known.
- screening for cystic fibrosis (CF) be offered to individuals with a family history of CF, partners with CF, one or both partners are Caucasian or of Ashkenazi Jewish descent.

# SCREENING TESTS

- All women attempting pregnancy with undocumented previous **rubella** infection or vaccination should be tested for immunity, and vaccinated if seronegative.
- Centers for Disease Control and Prevention (CDC) has determined that women need not avoid pregnancy for more than 1 month after vaccination.
- The CDC also recommends that all women without history of previous infection or evidence of immunity or vaccination against **varicella (chicken pox)** receive two doses of vaccine and avoid pregnancy for 1 month after each dose.

# SCREENING TESTS

- Screening for **sexually-transmitted infections** (STI) is recommended for all women at moderate to high risk for infection.
- Screening for all pregnant women for chlamydia and gonorrhea (nucleic acid-based tests), syphilis (rapid plasma reagin; RPR), hepatitis B (hepatitis B surface antigen; HBsAg), and voluntary screening for human immunodeficiency virus type 1 (HIV-1 ) at the first prenatal visit.

# SCREENING TESTS

- For women receiving inseminations of donor sperm, (ASRM) considers HIV-I screening mandatory, recommends screening for syphilis, hepatitis B and C, cytomegalovirus (CMV), HIV-2, and human T-cell lymphocyte virus (HTLV) types I and II, and suggests screening for chlamydia and gonorrhea.
- For male partners of women receiving inseminations of donor sperm, the ASRM recommends HIV-I and other STI screening.
- For recipients of donor oocytes or embryos and their male partners, the ASRM recommends screening for syphilis, hepatitis B and C, CMV, and HIV\_I.

# Chlamydia Trachomatis

Prophylactic antibiotics should be considered before uterine instrumentation if screening has not been carried out.(D)-NICE

Before undergoing uterine instrumentation women should be offered screening for Chlamydia trachomatis(B)-NICE



# History

- Sexual dysfunction
- Mumps / STD
- Trauma
- Past medical history
- Past surgical history
- ★ *cigarettes/ alcohol*
- Common medications
  - Ketoconazole
  - Cimetidine
  - Spironolactone

- **Heavy smoking**

- Development of impotence

- Abnormal semenogram :

- Decreased sperm count,  
alteration in motility , and increase  
in the abnormal forms.



# Physical Exam

## Male

- Infection
- Hernia
- Vas deferens
- Androgen deficiency
- Testicular mass
- Varicocele

# basic evaluation

**1-Semen analysis**

**2-Uterine/tubal evaluation**

**3-Determination of ovulation**



# Causes of Male Infertility

- Abnormality in sperm production
- Abnormality in sperm function
- Obstruction in the ductal system

# Male Infertility

- Semen Analysis
  - 3 days of abstinence, collection technique, 72 days for sperm to be ejaculated
  - Vol > 2ml
  - Concentration >  $20 \times 10^6 / \text{mL}$
  - Motility > 50%
  - Morphology > 15% normal
  - Note: SA best performed in andrology lab; If abnormal **always repeat**

# Causes for Abnormal SA

## Abnormal Count

- No sperm
  - Klinefelter's syndrome
  - Ductal obstruction
  - Hypogonadotropic-hypogonadism
- Few sperm
  - Genetic disorder
  - Endocrinopathies
  - Varicocele

# Hormone testing

- for all sub fertile men is **not necessary**.
- When sperm concentration is **less than 10 million per mL**,
- measurement of the **serum testosterone and (FSH)** levels is indicated.
  
- If the **total testosterone level is normal**, no further endocrine testing is needed.
- If the **total testosterone level is low**, the **serum luteinizing hormone and prolactin** levels can be checked to evaluate for a **pituitary cause**.

# Genetic studies

- **Karyotype**
  - 5.8% of infertile men has chromosomal abnormalities
  - 16% in azoospermia
  - Klinefelter syndrome, trisomy 21, mixed gonadal dysgenesis,
- **Yq microdeletion**
  - Not detected on routine karyotype testing
  - 3 distinct loci on the long arm
- **Specific gene defects (C.F mutation)**



# testicular biopsy

- A diagnostic testicular biopsy is indicated only in men (azoospermia, a normal testicular volume and normal FSH)(grade B recommendation)

# History

- Duration
- Previous pregnancies
- Ht / BMI
- Full menstrual history
- Androgenising signs
- Pelvic pain
- Past surgical history
- Medications / cigarettes / alcohol
- PID
- Thyroid signs
- STD
- Ep



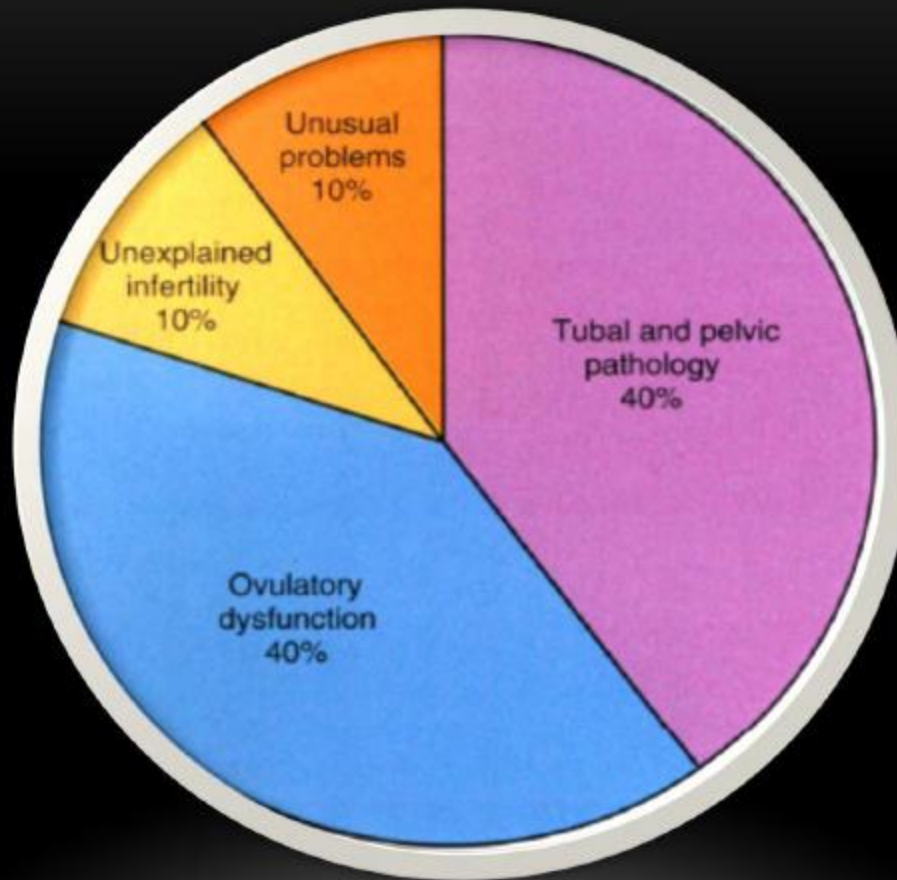
# Ruptured tube in EP





# **EVALUATION OF OVULATION**

# FEMALE INFERTILITY CAUSES



# WHO CLASSIFICATION OF ANOVULATION

WHO class 1: Hypogonadotropic hypogonadal anovulation (hypothalamic amenorrhea)

low or low-normal serum FSH and low serum estradiol concentrations due to decreased hypothalamic secretion of GnRH or pituitary unresponsiveness to GnRH.

WHO class 2: Normogonadotropic normoestrogenic anovulation

FSH secretion during the follicular phase of the cycle is subnormal. This group includes women with PCOS. Some ovulate occasionally, especially those with oligomenorrhea.

# WHO CLASSIFICATION OF ANOVULATION

## WHO class 3: Hypergonadotropic hypogonadism

The primary causes are POF (absence of ovarian follicles due to early menopause) and ovarian resistance (follicular form).

## Hyperprolactinemic anovulation

hyperprolactinemia inhibits gonadotropin and therefore estrogen secretion; they may have regular anovulatory cycles, but most have oligomenorrhea or amenorrhea. Their serum gonadotropin concentrations are usually normal or decreased.

# Ovulation

- A history of regular menstruation suggests regular ovulation

- Absence of PMS symptoms may suggest anovulation



- **OVULATORY FUNCTION**
- **•Women who report monthly menses and molimina (breast tenderness, dysmenorrhea, bloating) are typically ovulatory.**
- **•A woman with regular menstrual cycles every 21-35 days is most likely to be ovulating. But in small percentage of cases (< 10%)they may still be anovulating.**



# Diagnostic studies to confirm Ovulation

- Basal body temperature
  - Inexpensive
  - Accurate
  - Thermogenic potential of progesterone (.4-.8)
- Serum progesterone
  - After ovulation rises
  - Can be measured
  - Progesterone 3-4 ng/mL
- Urinary ovulation-detection kits
  - Measures changes in urinary LH

# PROGESTERONE

A **progesterone** level (mid-luteal)  $>3$  ng/mL is evidence of ovulation. serum progesterone measurement should be taken one week before the onset of expected menses (for example, day 21 if the woman has a 28-day cycle) .

If a woman has long and unpredictable cycles, the sample may need to be repeated weekly until the next cycle starts.

# LH SURGE

- **The LH surge** appears in the urine within 12 hours after it appears in the serum, The rise in serum LH typically occurs approximately 36 hours before the oocyte is released from the follicle .
- Home kits have a 5 to 10 percent false positive and false negative rate..
- According to the WHO, regular use of urinary LH kits should be discouraged because of the psychological pressure of timing intercourse and the expense of the kits.

# ENDOMETRIAL BIOPSY

- **Endometrial Biopsy** is preferably done between days 21 and 24 of the luteal phase of the cycle. for two reasons: (1) to document a secretory endometrium, which is indirect evidence that ovulation has occurred, and (2) to evaluate whether the maturity of the secretory endometrium is in phase ( consistent with menstrual cycle date) or out of phase ( luteal phase defect).
- a discrepancy of two or more days behind the menstrual dating defines luteal-phase deficiency(LPD).

# ENDOMETRIAL BIOPSY

- In normal fertile women, half will have a single out-of-phase biopsy (using two-day or greater lag criteria) . As the treatment of luteal phase defect does not improve pregnancy outcome in infertile women, luteal phase evaluation by histological dating of the endometrium is not worthwhile.(B)
- It is invasive, expensive, uncomfortable, unnecessary for evaluation of ovulation, and ineffective for assessment of endometrial receptivity for implantation.

## Basal body temperature

- (BBT) chart has largely been abandoned because it is cumbersome and is not reliable as a predictor of the time of ovulation.(B)

## Serial ovarian ultrasound

- disappearance of the preovulatory follicle/follicles together with the appearance of free fluid in the pouch of Douglas confirms that ovulation has occurred.

# Checking for Ovarian Reserve

**Age over 35**

**Unexplained infertility to identify unsuspected loss of ovarian reserve**

**Family history of early menopause**

**Previous ovarian surgery (ovarian cystectomy or drilling, unilateral oophorectomy), chemotherapy, or radiation**

**Smoking**

**Demonstrated poor response to exogenous gonadotropin stimulation**

# Checking for Ovarian Reserve

## Physiology:

- age related increase of FSH
  - Day 3 FSH: >10-15 mlu/mL
- Clomiphene Challenge Test (CCT)
  - Day 3 & Day 10 FSH (after clomid 50mg day 5-9)



## DAY 3 FSH AND CCCT

- Both the day 3 FSH level and the CCCT, which is a provocative test for measurement of FSH, are widely used for screening ovarian reserve.
- Women with a reduced pool of follicles and oocytes have insufficient production of ovarian hormones to provide normal inhibition of pituitary secretion of FSH, so FSH rises early in the cycle .

# DAY 3 FSH AND CCCT

- The CCCT involves oral administration of 100 mg clomiphene citrate on cycle days 5 through 9 with measurement of day 3 and day 10 FSH levels and day 3 estradiol level.
- With either test, a normal result is not useful in predicting fertility, but a highly abnormal result (we use FSH >20 mIU/mL) suggests that pregnancy will not occur with treatment involving the woman's own oocytes
- If CCCT is performed, we consider FSH less than 15 mIU/mL on both day 3 and day 10 suggestive of adequate ovarian reserve; an elevated FSH level on either day 3 or day 10 suggests decreased ovarian reserve

# DAY 3 FSH

- Based on these findings and the cost advantage and simplicity of the day 3 FSH, we obtain a day 3 FSH concentration and consider a value less than 10 mIU/mL suggestive of adequate ovarian reserve, and levels of 10 to 15 mIU/ml borderline.
- The upper threshold for a normal FSH concentration is laboratory dependent; cutoff values of 10 to 25 mIU/mL have been reported because of use of different FSH assay reference standards and assay methodologies.

# DAY 3 ESTRADIOL

- There are conflicting data as to whether it is predictive of ovarian reserve and the response to ovarian stimulation (as in IVF).
- A value  $<80$  pg/mL suggestive of adequate ovarian reserve, but other cut-offs are also utilized.
- In one prospective study of women undergoing IVF, day 3 estradiol levels  $>80$  pg/mL resulted in higher cycle cancellation rates and lower pregnancy rates, and estradiol levels  $>100$  pg/mL were associated with a 0 percent pregnancy rate

# DAY 3 ESTRADIOL

- Elevated basal estradiol levels are due to advanced **premature follicle recruitment** that occurs in women with poor ovarian reserve.
- High estradiol levels can inhibit pituitary FSH production and thus mask one of the signs of decreased ovarian reserve in perimenopausal women.
- **measurement of both FSH and estradiol levels helps to avoid false-negative FSH testing.**

# ANTI-MULLERIAN HORMONE

- AMH is produced by the granulosa cells of preantral and small antral follicles, beginning when primordial follicles start development and ending when they reach a diameter of 2-6 mm.
- The number of small antral follicles correlates with the size of the residual follicular pool and AMH levels decline progressively, becoming undetectable near the menopause.
- AMH can be measured anytime during the menstrual cycle.

# ANTI-MULLERIAN HORMONE

- A serum AMH level above 0.5 ng/mL is consistent with good ovarian reserve. Levels less than 0.15 ng/mL suggest the patient will have a poor response to IVF .
- Low threshold values have good specificity for poor response to ovarian stimulation, but not for predicting pregnancy.

## **Antral follicle count (AFC)**

- On transvaginal ultrasound, the presence of 4 to 10 antral follicles measuring between 2 and 10 mm in diameter suggests good ovarian reserve .



# ANOVULATION



# Anovulation

## Symptoms

- Irregular menstrual cycles
- Amenorrhea
- Hirsutism
- Acne
- Galactorrhea
- PCO
- POF

## Evaluation

- Follicle stimulating hormone
- Lutenizing hormone
- Thyroid stimulating hormone
- Prolactin
- Androstenedione
- Total testosterone
- DHEAS

# POLYCYSTIC OVARIAN SYNDROME

## Rotterdam criteria

- Oligo- and/or anovulation
- Clinical and/or biochemical signs of hyperandrogenism
- Polycystic ovaries (by ultrasound)
- In addition, other etiologies (congenital adrenal hyperplasias, androgen-secreting tumors, Cushing's syndrome) must be excluded

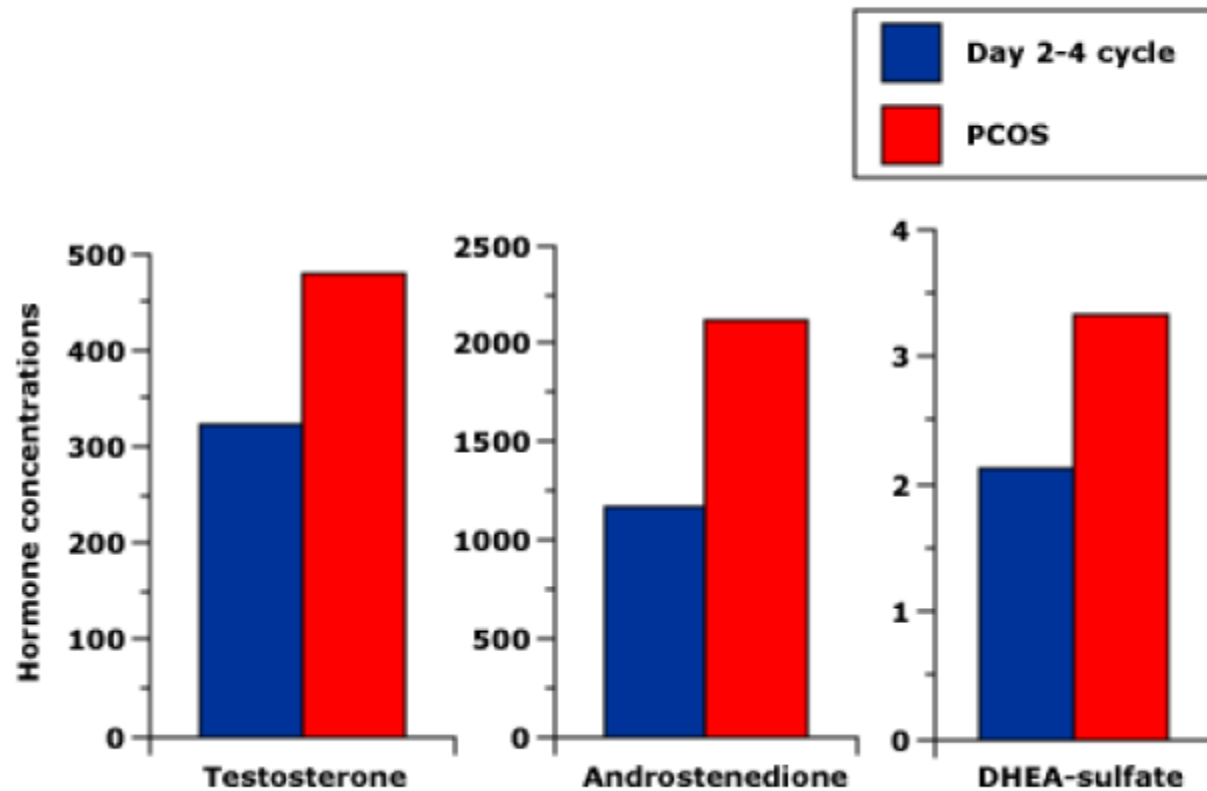
# MENSTRUAL IRREGULARITY

- Biochemical evaluation of the oligomenorrhea is the same as in women with these disorders in the absence of PCOS.
- In addition to measurement of **serum hCG to rule out pregnancy, minimal laboratory testing should include measurements of serum prolactin, TSH, and FSH to rule out hyperprolactinemia, thyroid disease, and ovarian failure respectively.**

# HYPERANDROGENISM

- We do not routinely measure serum androgen concentrations in women with mild hirsutism.
- In women with moderate to severe hirsutism, we typically measure a total and free testosterone concentration, and if there are concerns about a possible androgen-secreting tumor causing the hyperandrogenism, we add serum DHEA-S.
- Other tests that should be considered depend upon the clinical presentation.

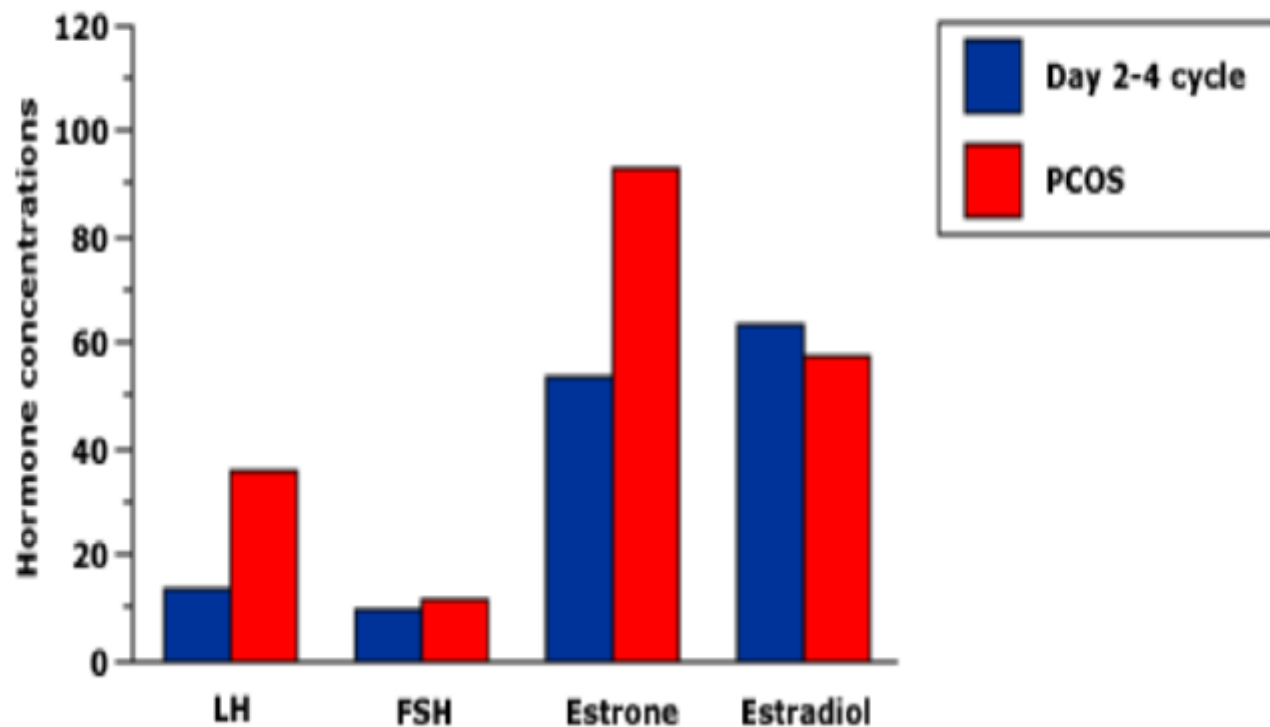
## polycystic ovary syndrome



# HYPERANDROGENISM

- An elevation in free testosterone is the most sensitive test to establish the presence of hyperandrogenemia. Elevated insulin and androgen levels both act to inhibit hepatic production of SHBG.
- Elevation of serum luteinizing hormone (LH) concentrations, normal serum estradiol, and increased serum estrone concentrations. None of these hormones are part of the diagnostic criteria for PCOS and, therefore, do not need to be measured.

## Serum estrogen and gonadotropin concentrations in women with the polycystic ovary syndrome





# **DYSLIPIDEMIA**

- **Lipid abnormalities, in particular low serum HDL, high serum triglycerides, and high serum LDL concentrations are common in women with PCOS.**
- **We suggest a fasting lipid profile in women with newly diagnosed PCOS.**

# OGTT

- Both lean and obese women with PCOS may have insulin resistance and hyperinsulinemia.
- Many obese women with PCOS are diagnosed with impaired glucose tolerance (up to 35 percent) or type 2 diabetes mellitus (up to 10 percent)
- A standard fasting glucose measurement lacks the sensitivity to detect impaired glucose tolerance or early type 2 diabetes.

**Once the diagnosis of PCOS is made, we perform an OGTT in all patients.**

- When this is not practical, a FBS along with a hemoglobin A1C can be obtained.**
- If either one is abnormal, an OGTT should be performed to distinguish between IGT and diabetes.**

- Patients with normal glucose tolerance should be rescreened at least once **every two years** or more frequently if additional risk factors are identified.
- Patients with impaired glucose tolerance should be screened annually for development of type 2 diabetes.

# INSULIN RESISTANCE

- Hyperinsulinemic euglycemic clamp.
- Homeostatic model assessment of insulin resistance (HOMA-IR)
- insulin sensitivity check index (QUICKI)
- The fasting serum insulin concentration is easy to obtain and requires no calculations; in euglycemic White women with PCOS, values greater than 20-30 $\mu$ U/mL suggest insulin resistance.
- The fasting glucose/insulin ratio has been used widely as an index of insulin sensitivity in women with PCOS; a ratio less than 4.5 has reasonable sensitivity and specificity for insulin resistance.

*Interpretation*

*2-hour Glucose*

*2-hour Insulin<sup>†</sup>*

Normal

<140 mg/dL

Impaired glucose tolerance

140–199 mg/dL

Diabetes mellitus

≥200 mg/dL

Normal

<80–100  $\mu$ U/mL

Insulin resistance

>80–100  $\mu$ U/mL

Severe insulin resistance

>300  $\mu$ U/mL

- *As the sheer number of different measures of insulin resistance demonstrates, there is no uniformly accepted test for measuring insulin resistance in a clinical setting. Consequently, routine screening for insulin resistance is not recommended.*

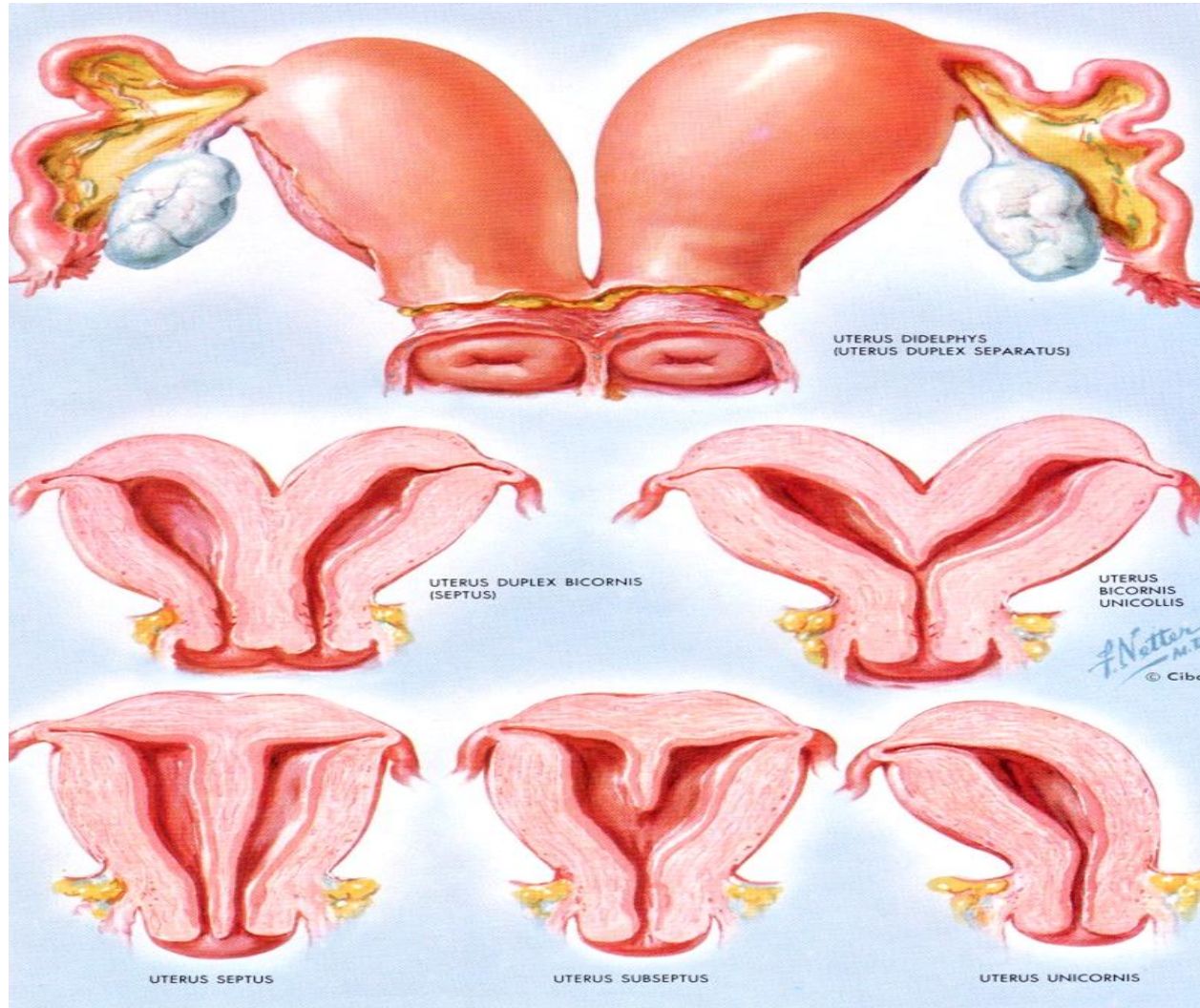
# **ANATOMIC DISORDERS OF THE FEMALE GENITAL TRACT**



# Uterine Factors

- **Hysterosalpingography (HSG)**
  - HSG v Hysterscope: Sens 98%, Spec 35%
  - All polyp vs submucous myomas
- **Ultrasound/Sonohysterography**
  - SIS 75 sens, spec 90%

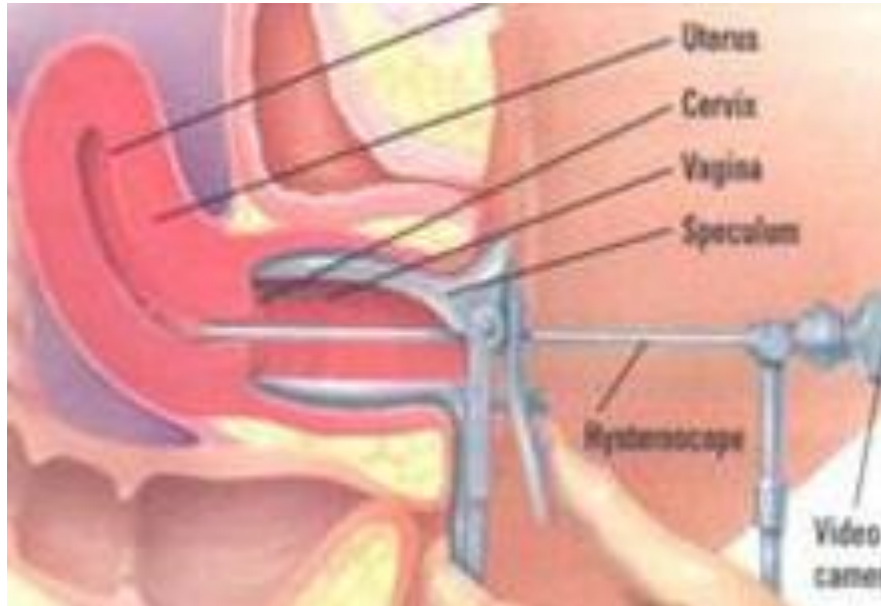
# Congenital Anomalies



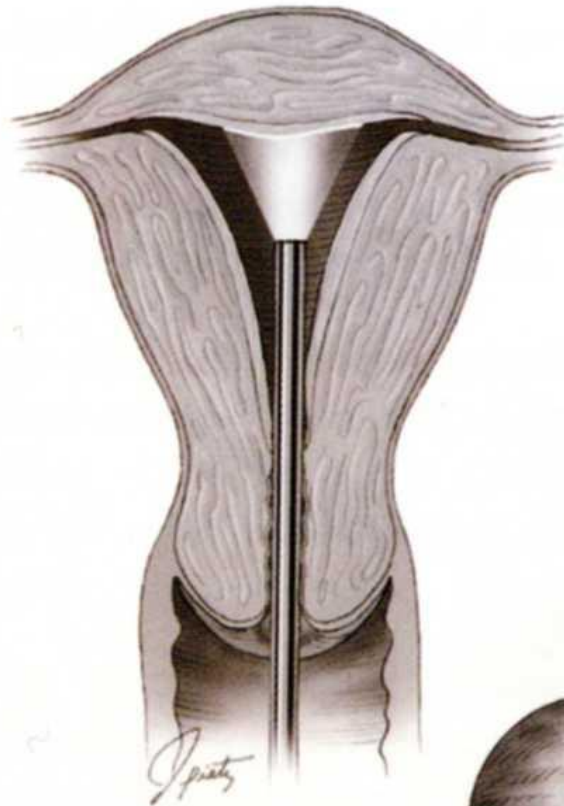
# Acquired Disorders

- Acute salpingitis
  - Alters the functional integrity of the fallopian tube
    - N. gonorrhea and C. trachomatis
- Intrauterine scarring
  - Can be caused by curettage
- Endometriosis, scarring from surgery, tumors of the uterus and ovary
  - Fibroids, endometriomas ,Trauma

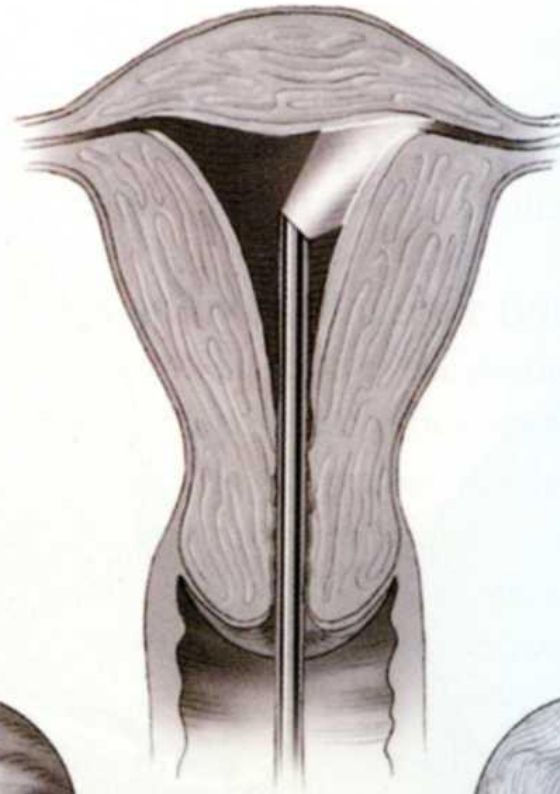
# Hysteroscopy



# Hysteroscopy



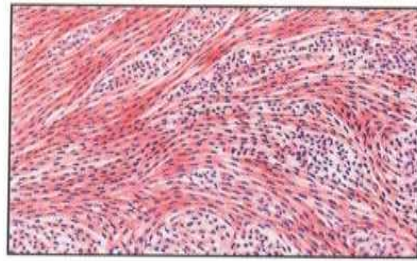
0-degree angle



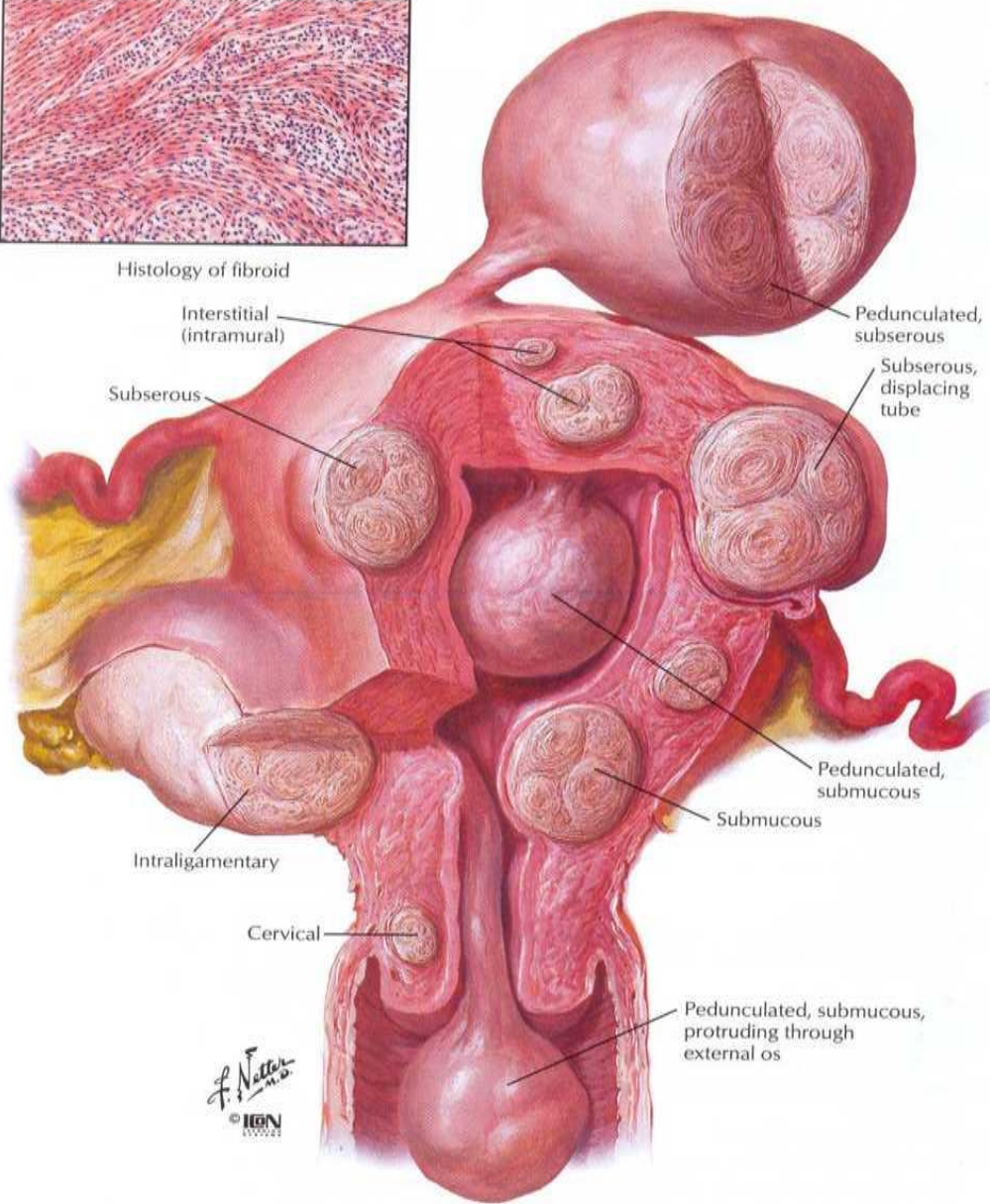
30-degree angle







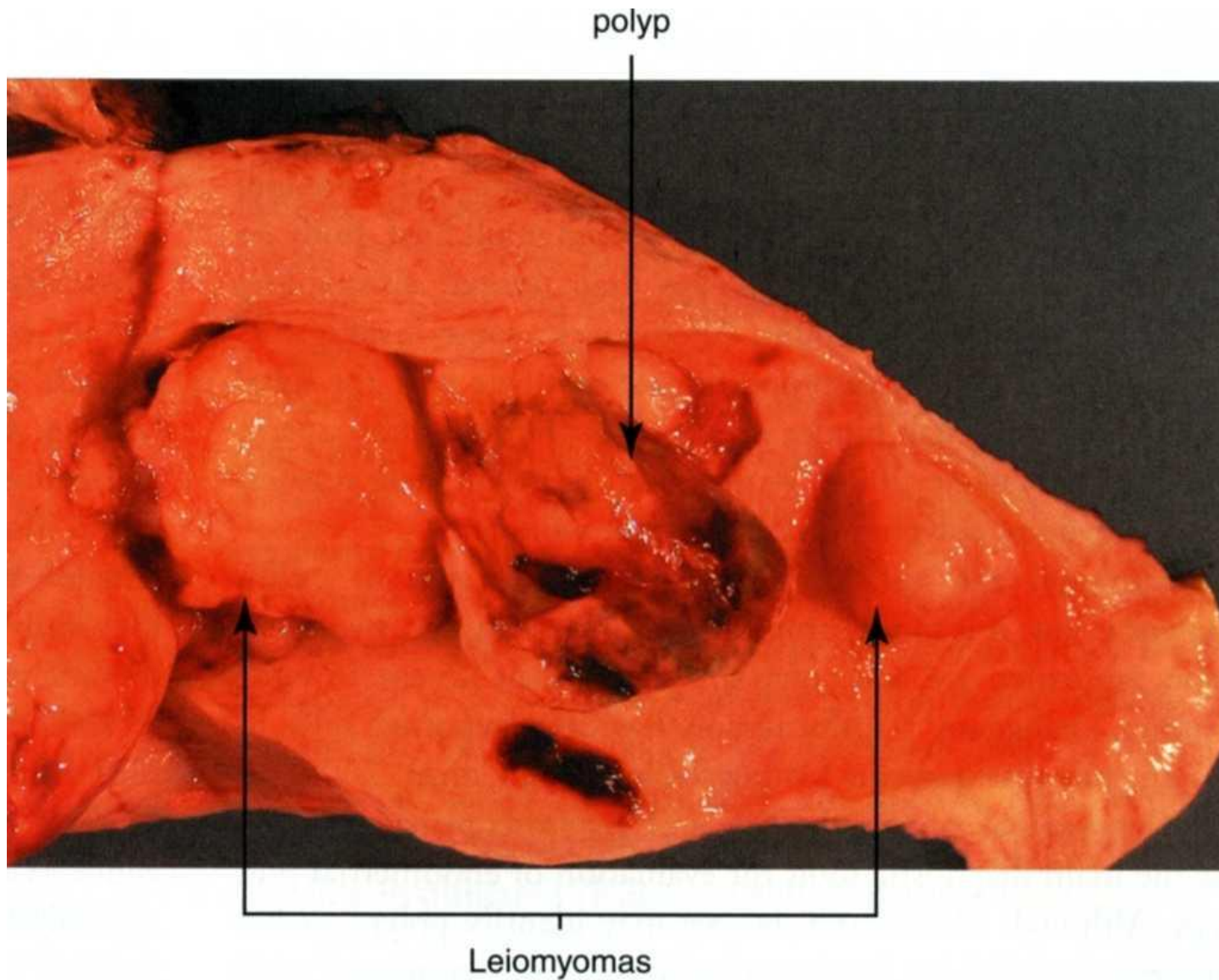
Histology of fibroid



*F. Netter M.D.*  
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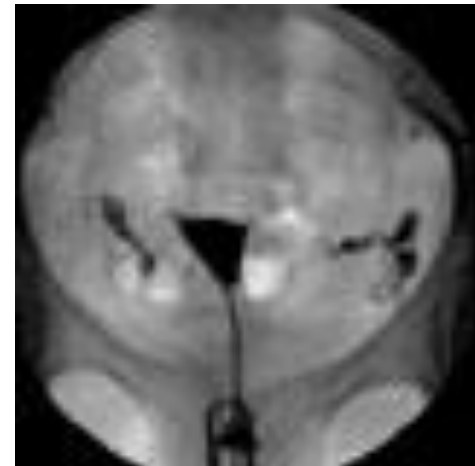
# Leiomyoma

# Leiomyoma



# Tubal Factor

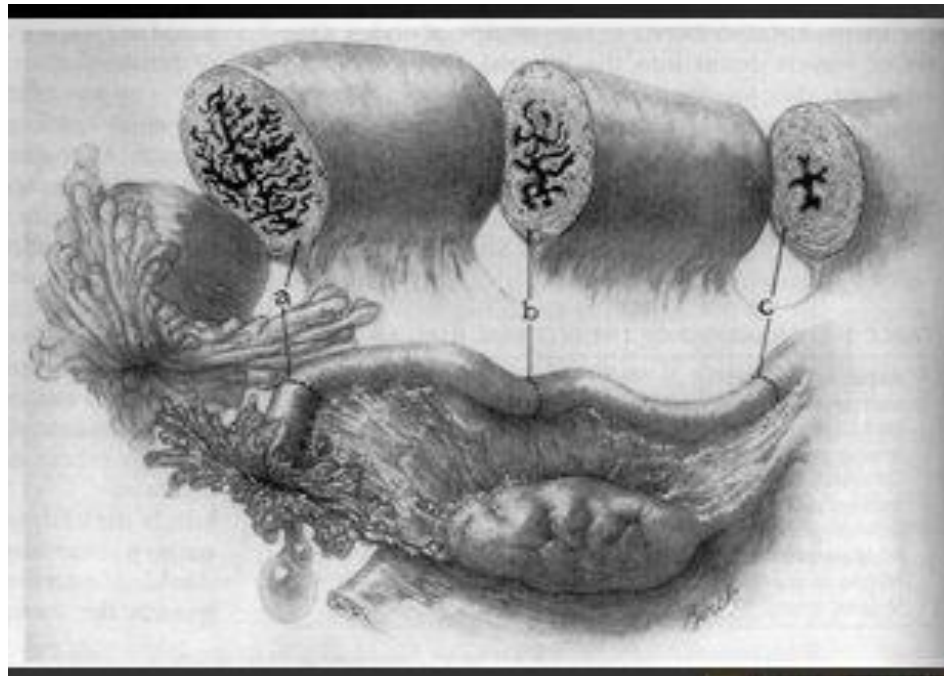
- Risk factors
  - PID; 12%, 24%, 75%, Ectopic 6 fold
- HSG
  - 2-5 days after menses
  - 1-3 % infection rate high risk
  - Increase preg rate
  - Possibility of Treatment



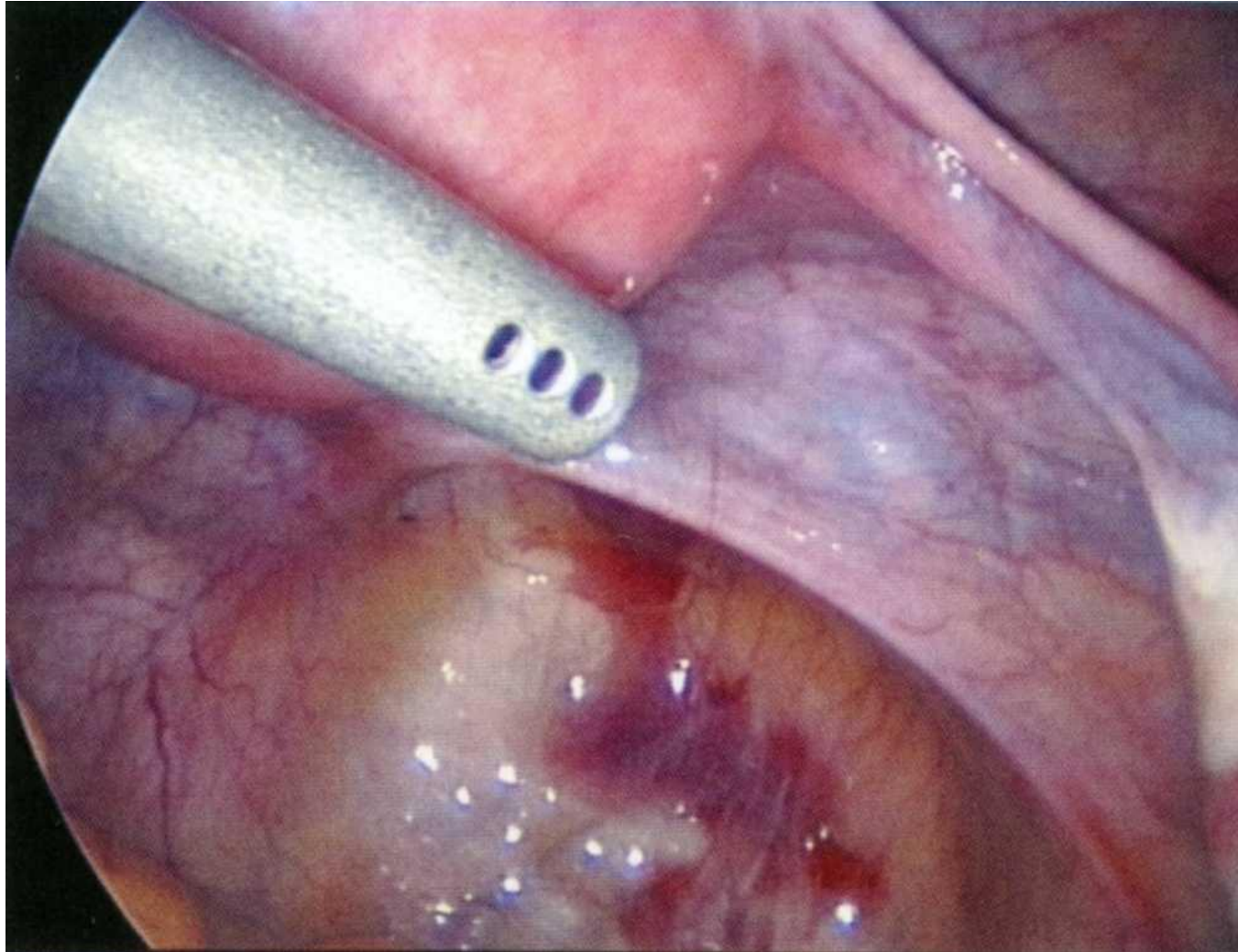


# Tubal Factor

- Peristalsis
- Ciliary dysfunction
- Narrowing
- Blockage



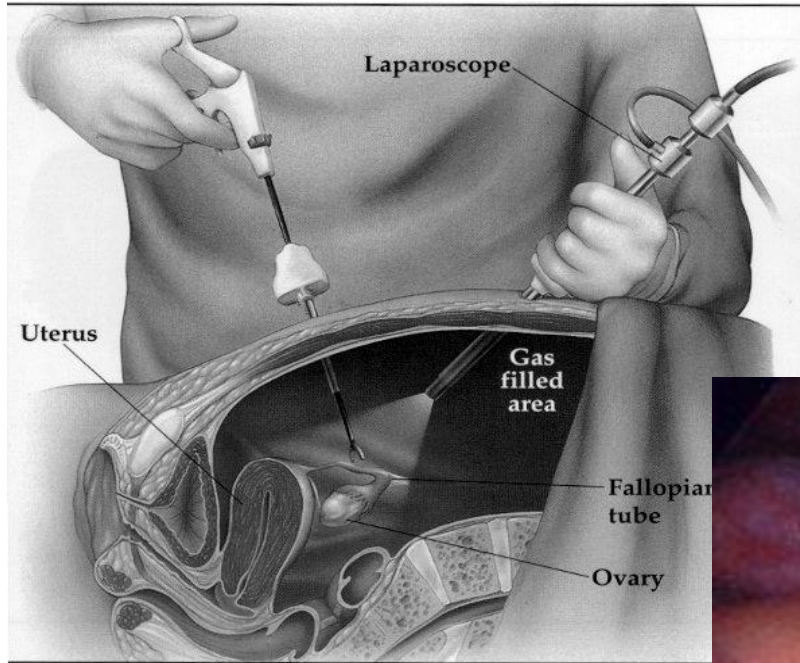
# Endometriosis



# Endometriosis

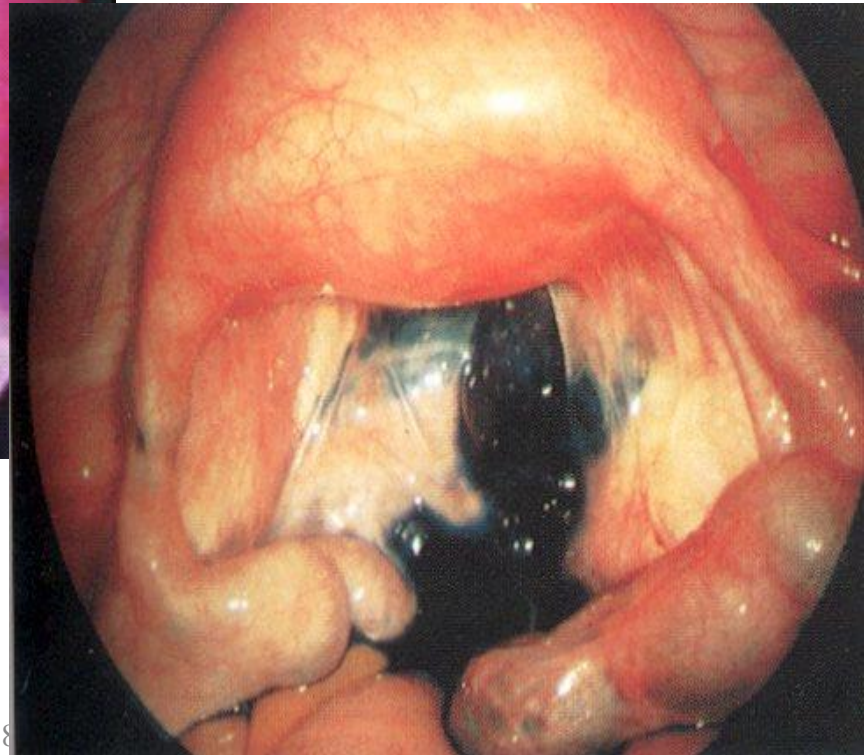
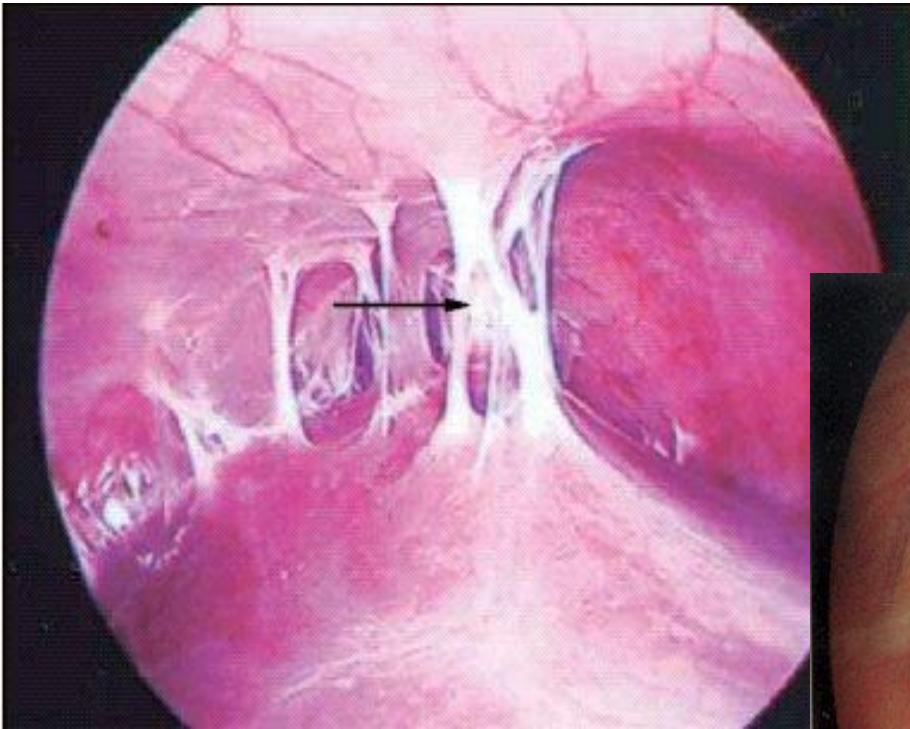


# Lap / Dye





# Pelvic Infection and Tubal Disease

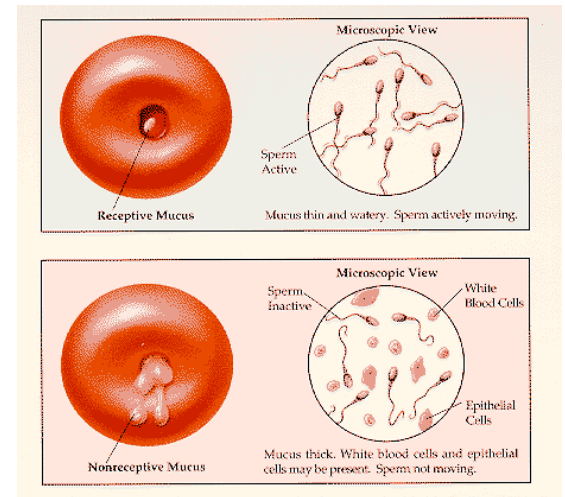
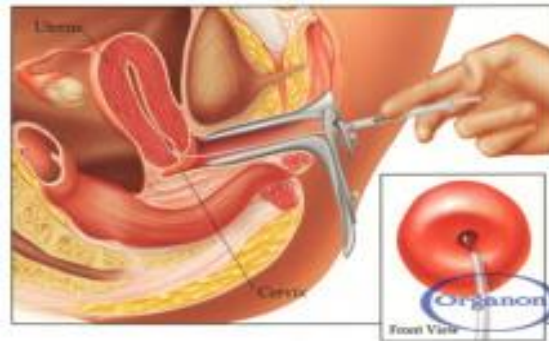


# Septate uterus



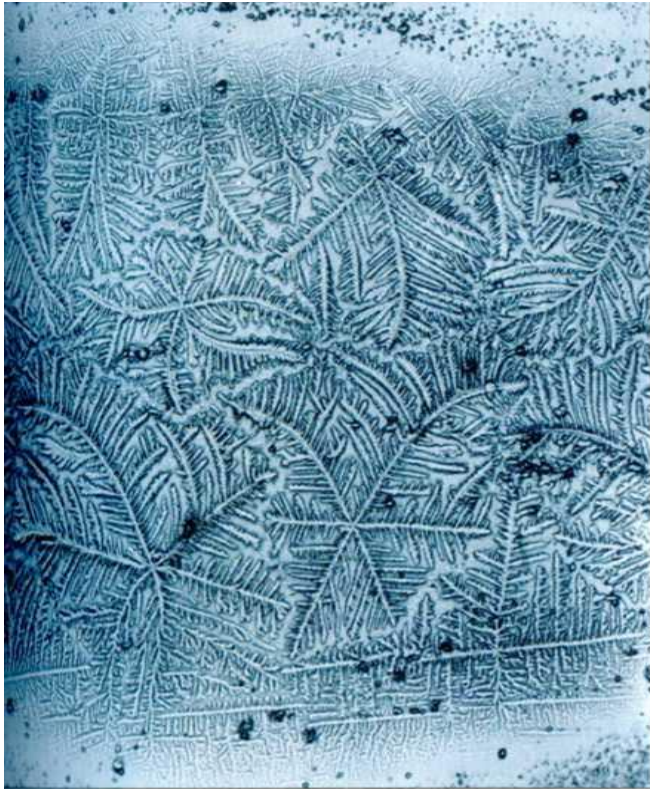
# Cervical Factor

- Postcoital test (Sims-Huhner)  
Intercourse (2-12 hrs) for test  
Look at: pH, Sperm, Spinnbarkeit, Ferning  
Cellularity, Sperm Shaking, sperm  
Agglutination  
Has seen better days

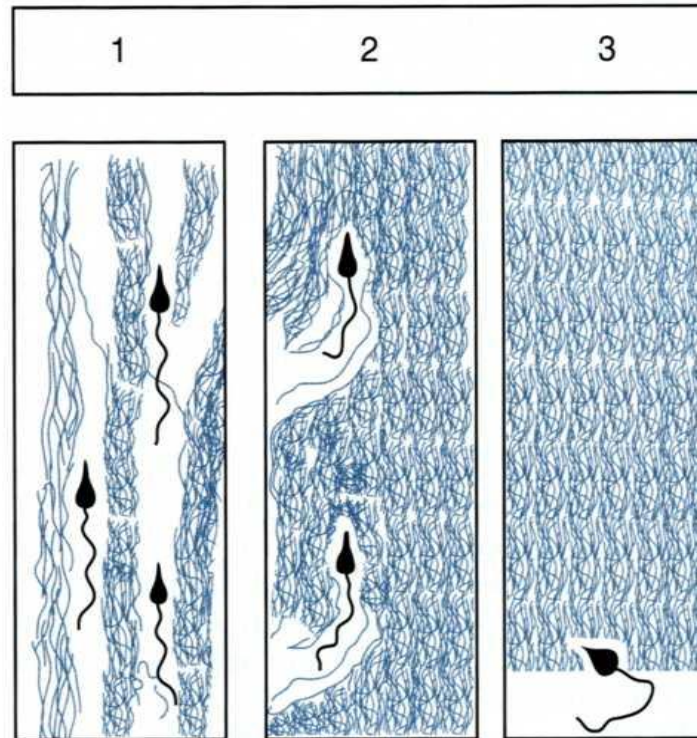




# Ferning



A



B



# Unexplained infertility



- 15-25 % of infertile couples will have a completely normal workup



# TREATMENT OF INFERTILE



# Emotional Impact

- Infertility places a great emotional burden on the infertile couple.
- The quest for having a child becomes the driving force of the couples relationship.
- The mental anguish that arises from infertility is nearly as incapacitating as the pain of other diseases.
- It is important to address the emotional needs of these patients.

# Therapy

## Male factor

- Urology consult
- Surgery
- Donor sperm insemination
- Intrauterine insemination (IUI)
- In Vitro Fertilization- Embryo Transfer (IVF-ET)
- IVF with ICSI (intracytoplasmic sperm injection)

# Anovulation

- Clomiphene citrate
  - Antiestrogen
  - Combines and blocks estrogen receptors at the hypothalamus and pituitary causing a negative feedback
  - Increases FSH production
    - stimulates the ovary to make follicles



# Ovulation Induction

## PCOS

### 1<sup>st</sup> line

Clomiphene – 60% pregnant after 6 months

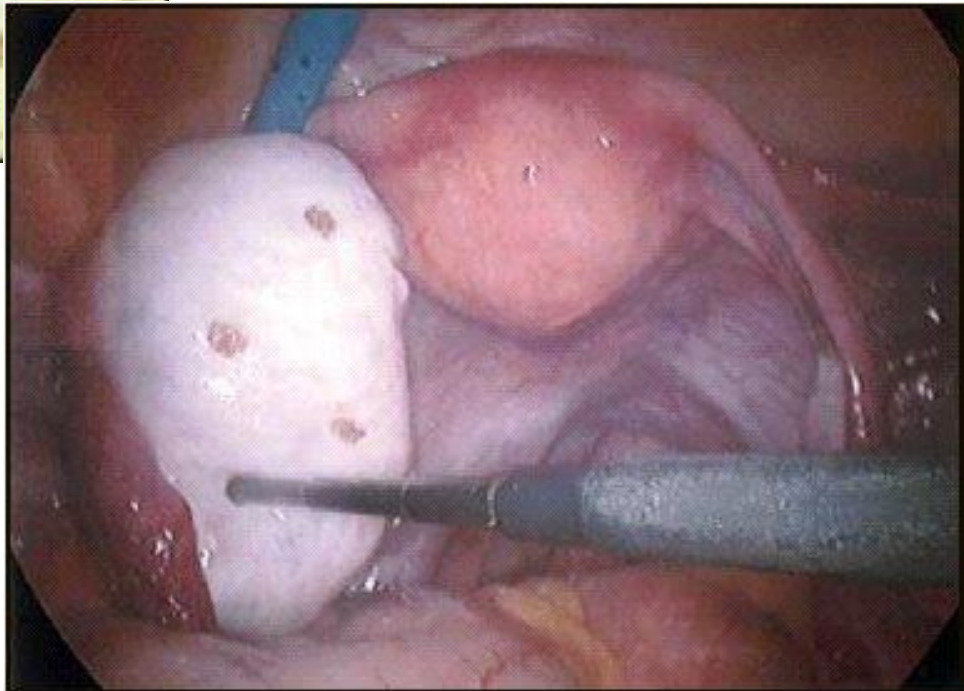
### 2<sup>nd</sup> line

Metformin

FSH

Surgical Ovarian Drilling

# Ovarian Drilling



# Ovarian Induction

## ❖ Hypothalamic amenorrhoea

❖ FSH

❖ Pulsatile GnRH

## ❖ Hyperprolactinaemia

❖ Carbergolide



# POF

## ❖ treatment

- with **estrogen** has been observed to lower elevated
- **FSH levels** in women with POF,
- **donor oocytes**

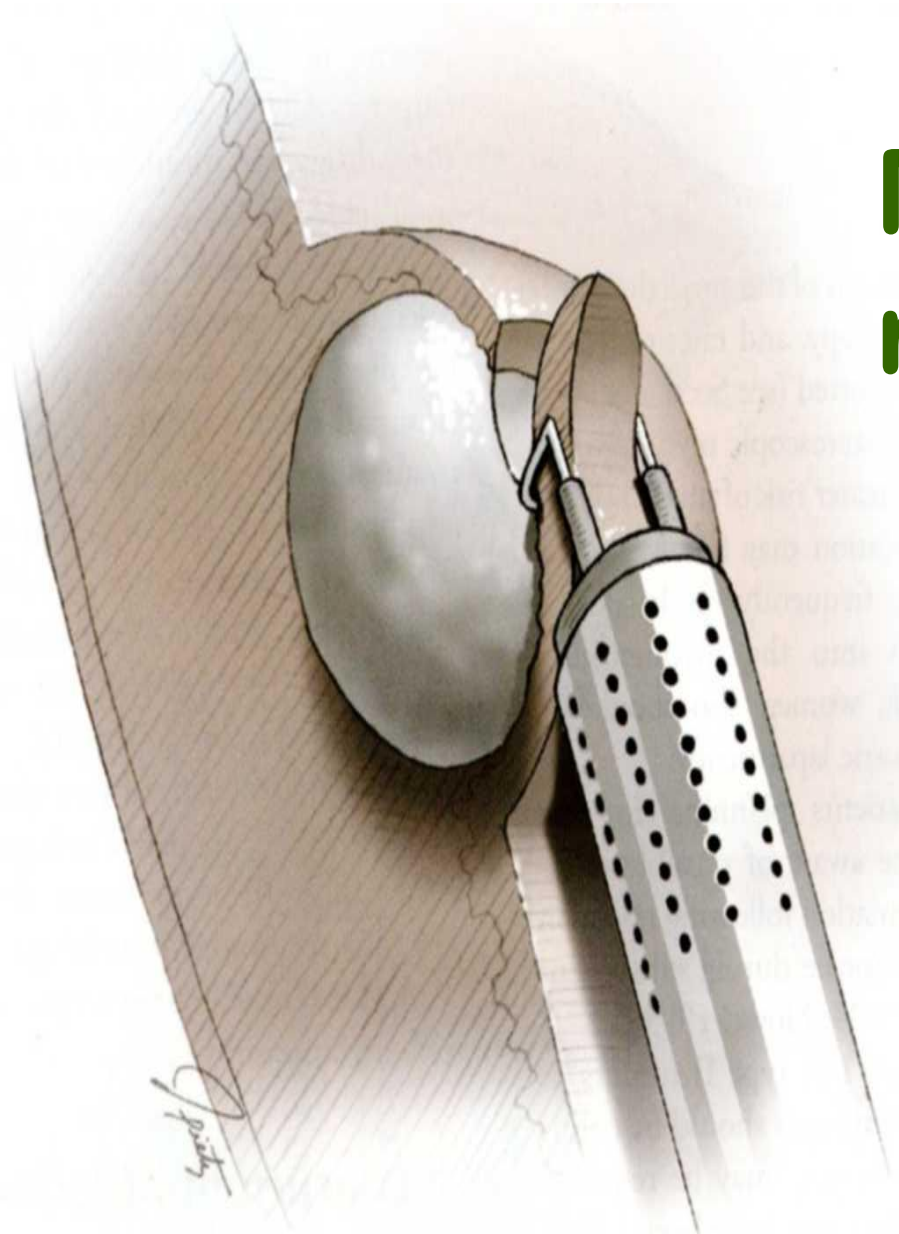
# Superovulatory Medications

- If no response with clomid then gonadotropins-FSH (e.g. pergonal) can be administered intramuscularly
  - This is usually given under the guidance of someone who specializes in infertility
- This therapy is expensive and patients need to be followed closely
- Adverse effects
  - Hyperstimulation of the ovaries
  - Multiple gestation
  - Fetal wastage

# Anatomic Abnormalities

- **Surgical treatments**
  - Septoplasty
  - Tuboplasty
  - Myomectomy
- **Surgery may be performed**
  - laparoscopically
  - hysteroscopically
- **If the fallopian tubes are beyond repair one must consider in vitro fertilization**

# Myoma resection



# Septal resection



# Tubal cannulation



# Endometriosis



# Assisted Reproduction

- Indications for ART:
  - Tubal disease
  - Male-factor infertility
  - Endometriosis
  - Premature ovarian failure
  - Polycystic ovarian syndrome
  - Immunologic infertility
  - Unexplained infertility

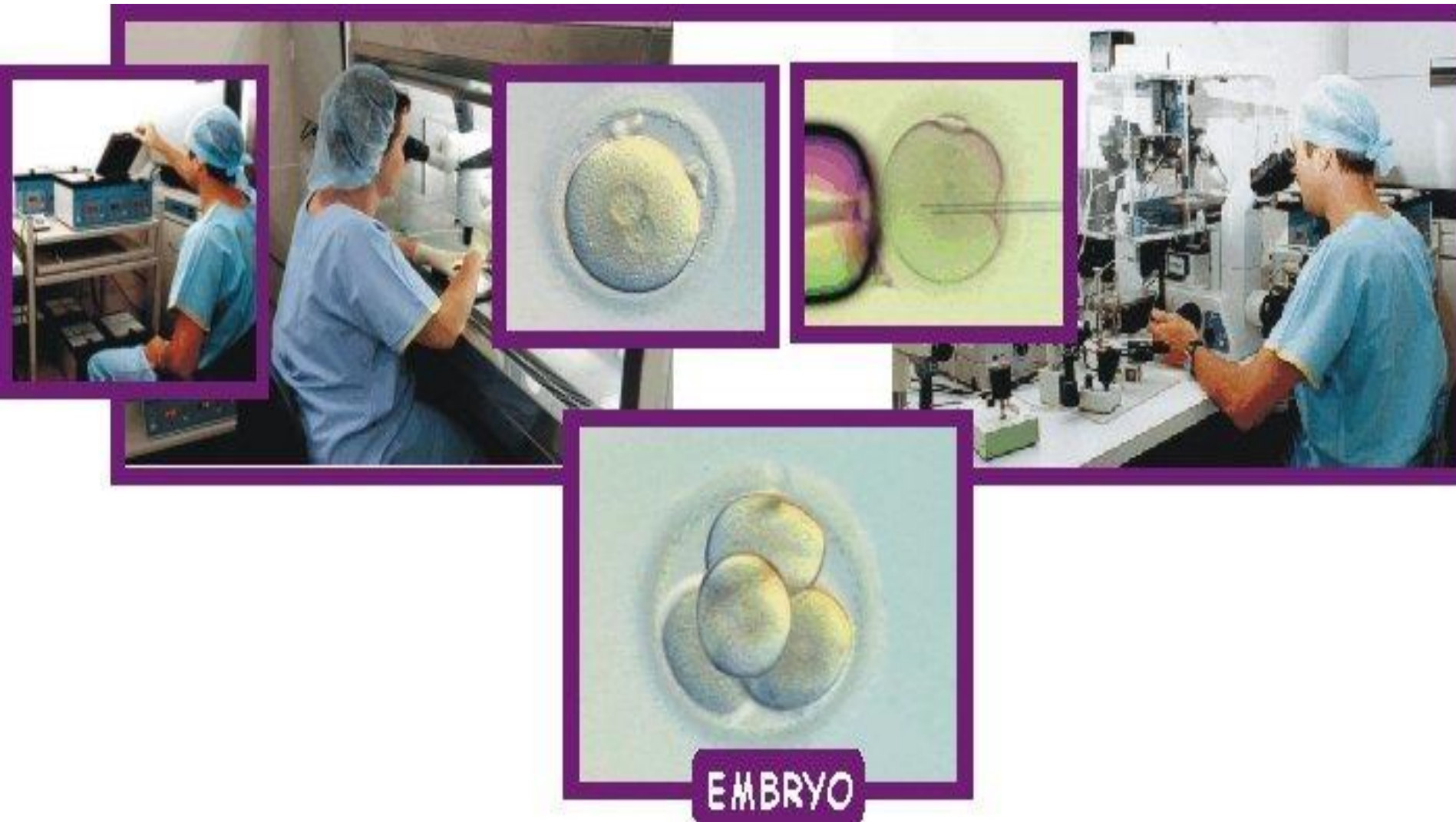


# IVF

(In Vitro Fertilisation)

# ICSI

(Intra Cytoplasmic Sperm Injection)






# Assisted Reproduction: Cryopreservation

- Freezing, thawing and using:
  - Sperm
  - Embryos
  - Oocytes

# Treatment Options

<b>Advice</b>	Assessment
<b>OI</b>	Ovulation Induction
<b>IUI</b>	Intrauterine Insemination
<b>IVF</b>	In Vitro Fertilisation
<b>ICSI</b>	Intra Cytoplasmic Sperm Injection
<b>SSC</b>	Surgical Sperm Collection
<b>Donor</b>	Sperm, Eggs or Embryos

# Clinical therapy

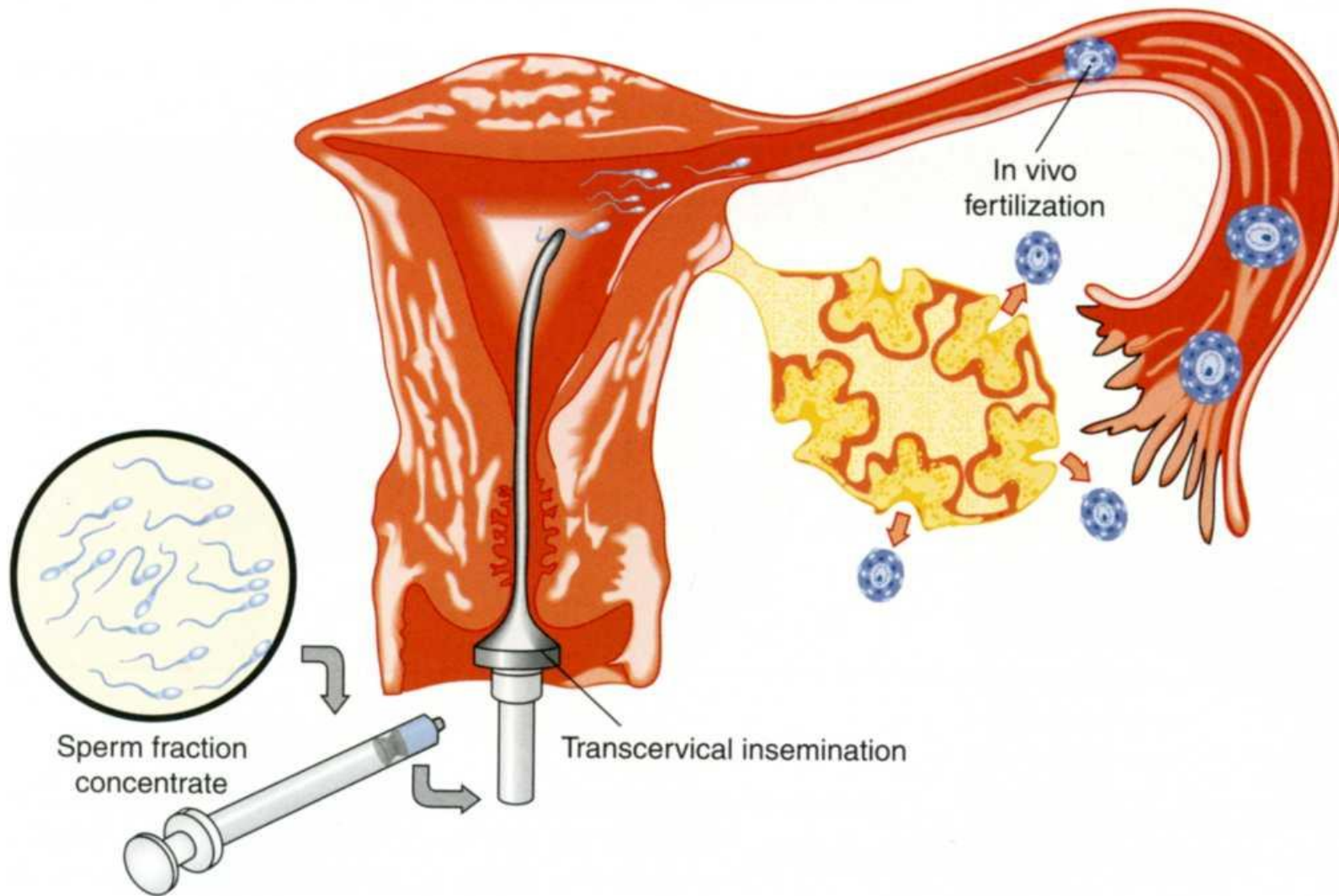
- From the lowest  highest
- We choose  
IUI  IVF  ICSI

# IUI-----intrauterine insemination



- Send sperms directly into the uterine cavity
- First choice for male immunological infertility





IUI

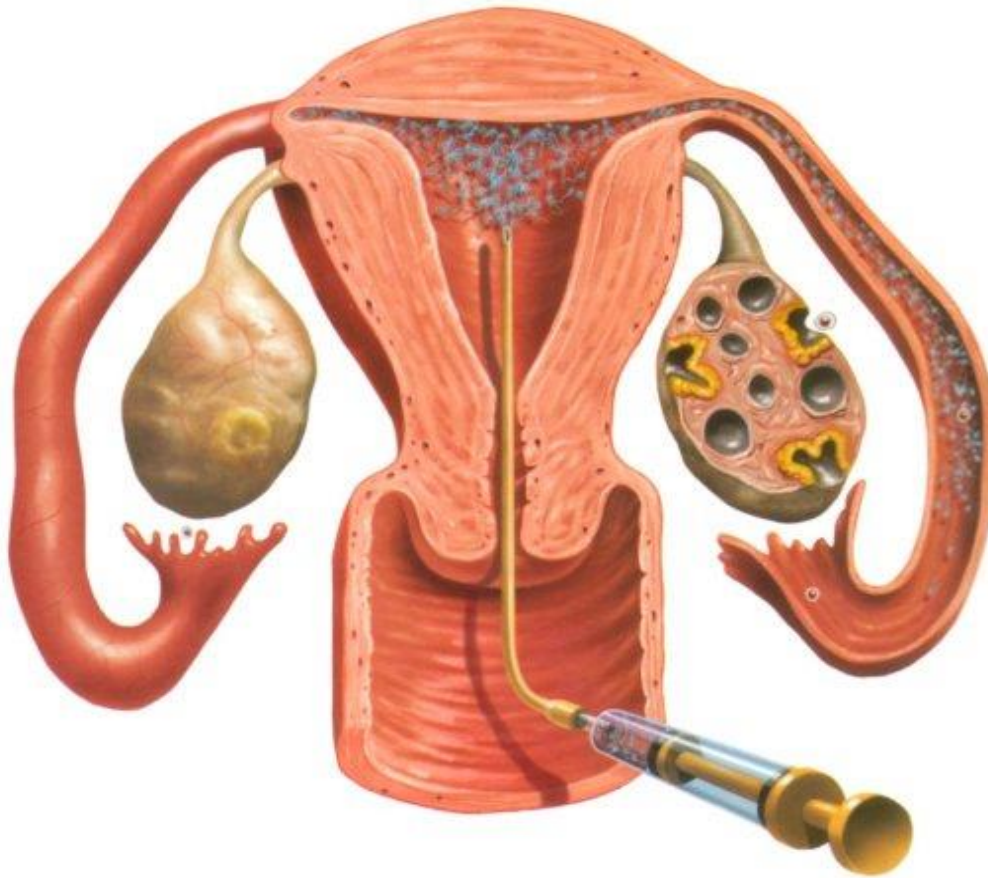
# Intrauterine Insemination

## ❖ Indications

- ❖ Unexplained
- ❖ Mild male factor

## Success/Cycle

- ❖ Natural 10-15%
- ❖ Stimulated 15-20%

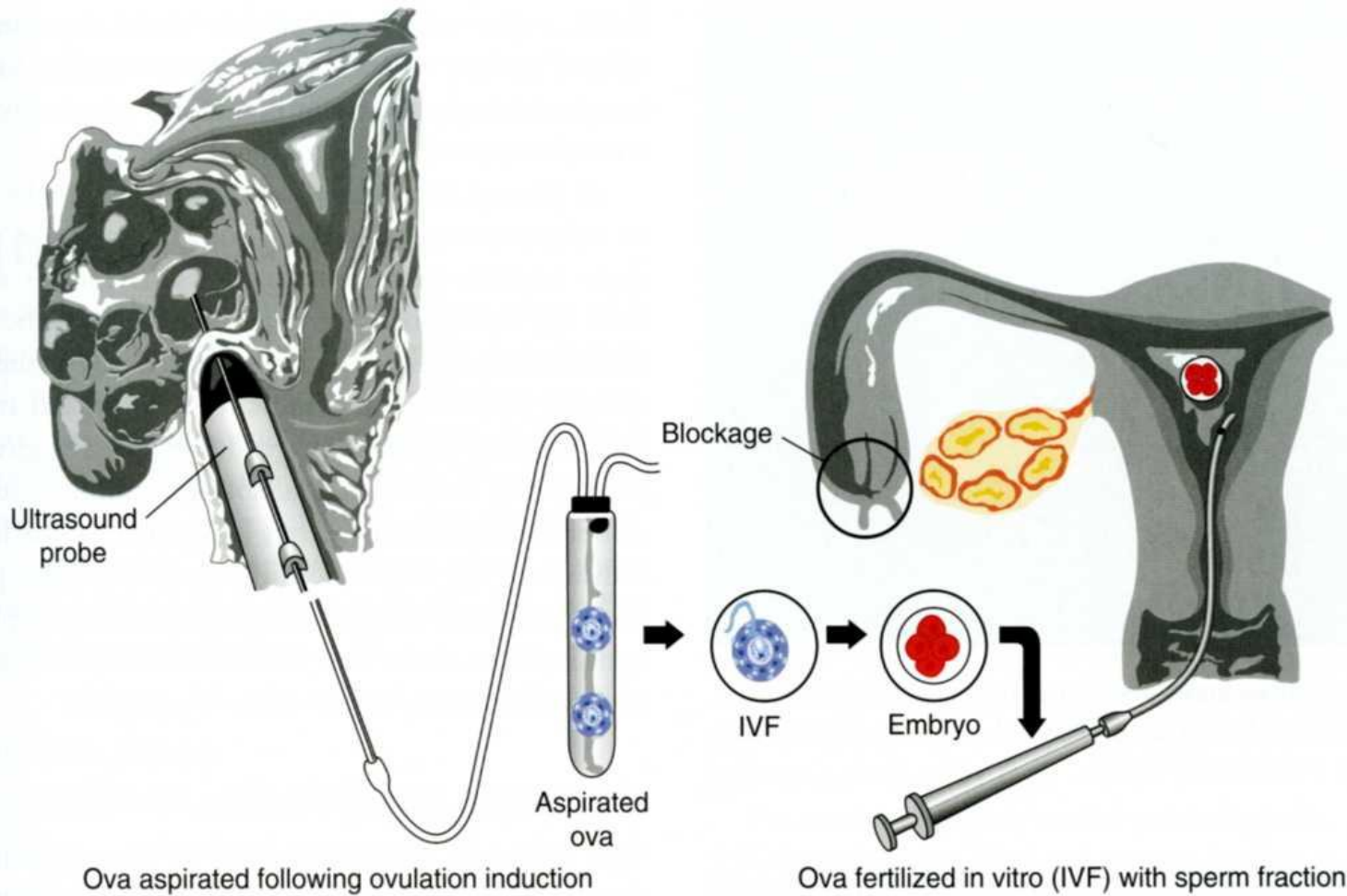




# IVF--- in vitro fertilization

- ❖ Not only overcomes the difficulty of AsAb-attached sperms penetrating the cervical mucus, but also make sure there are enough sperms contacting with ovum.





# IVF

# In Vitro Fertilisation

## ❖ Indications

- ❖ Prolonged unexplained
- ❖ Tubal factor
- ❖ Severe male factor

# ICSI---intracytoplasmic sperm injection

- The most effective method for severe immunological infertility
- But with the highest cost tens of thousands of dollars!



# Intracytoplasmic Sperm Injection(ICSI)



# Complications

- Multiple pregnancy
- Ovarian hyperstimulation syndrome (OHSS)
  - Ovaries may enlarge and cause pain and bloating
  - Higher risk in PCOS v
- Bleeding or infection
- Low birth weight
- Birth defects



Thank you for your  
attention

