

## **FEMALE FERTILITY LABS EXPLAINED**

### **HORMONE LEVELS (serum/blood)**

#### **Follicle Stimulating Hormone (FSH)**

**Time to Test: Day 3 - Normal Range: 3-20 mIU/ml**

- FSH is often used as a gauge of ovarian reserve. In general results indicate the following:
  - 6: considered excellent
  - 6-9: good
  - 10-13: diminished reserve
  - 13+: very hard to stimulate
- In Polycystic Ovarian Syndrome (PCOS) testing, the **LH: FSH ratio** may be used in the diagnosis.
- The ratio is usually close to 1:1, but if the LH is higher, it is one possible indication of PCOS.

#### **Estradiol (E2)**

**Time to Test: Day 3 - Normal Range: 25-75 pg/ml**

- Levels on the lower end tend to be better for stimulating.
- Abnormally high levels on day 3 may indicate existence of a functional cyst (normal) or Diminished Ovarian Reserve (DOR).

**Time to Test: Day 4-5 of medication - Range: 100+ pg/ml or 2x Day3**

- There are no charts showing E2 levels during stimulation since there is a wide variation depending upon how many follicles are being produced as well as their size.
- Most doctors will consider any increase in E2 a positive sign, but others use a formula of either 100pg/ml after 4 days of stimulation meds, or a doubling of E2 from the level taken on Day 3 of cycle.

**Time to Test: Surge/hCG day - Range: 200+ pg/ml**

- The levels should be 200-600 per mature (18mm) follicle.
- These levels are sometimes lower in overweight women.

#### **Luteinizing Hormone (LH)**

**Time to Test: Day 3 - Normal Range: <7 mIU/ml**

- A normal LH level is similar to FSH.
- An LH that is higher than FSH is one indication of PCOS.

**Time to Test: Surge Day > Normal Range: >20 mIU/ml**

- The LH surge leads to ovulation within 48 hours.

#### **Prolactin**

**Time to Test: Day 3 - Normal Range: <24 ng/ml**

- Increased prolactin levels can interfere with proper ovulation. They may also indicate further testing (MRI) should be done to check for a pituitary tumor. Some women with PCOS also have hyperprolactinemia.

#### **Progesterone (P4)**

**Time of Test: Day 3 - Normal Range: <1.5 ng/ml**

- Progesterone is often called the follicular phase level. An elevated level may indicate a lower pregnancy rate.

**Time of Test: 7 days past ovulation or Day 21- Normal Range: >15 ng/ml**

- A progesterone test is done to confirm ovulation. When a follicle releases an egg, it then becomes what is called a corpus luteum and produces progesterone. In general results indicate the following:
  - 10+: is normal on a natural cycle
  - 15+: is normal on a medicated cycle
  - There is no mid-luteal level that predicts pregnancy.

### **Thyroid Stimulating Hormone (TSH)**

**Time of Test: Day 3 - Normal Range: 0.4-4 mIU/ml**

- Mid-range normal in most labs is about 1.7. A high level of TSH combined with a low or normal T4 level generally indicates hypothyroidism, which can affect fertility.

### **Free Triiodothyronine (T3)**

**Time to Test: Day 3 - Normal Range: 1.4-4.4 pg/ml**

- Sometimes the diseased thyroid gland will start producing very high levels of T3 but still produce normal levels of T4.

### **Free Thyroxine (T4)**

**Time to Test: Day 3 - Normal Range: 0.8-2 ng/dl**

- A lower level may indicate a thyroid disorder or a non-functioning pituitary gland which is not stimulating the thyroid to produce T4. If the T4 is low and the TSH is normal, this is more likely to indicate a disorder of the pituitary.

### **Total Testosterone**

**Time to Test: Day 3 - Normal Range: 6-86 ng/dl**

- Testosterone is an adrenal gland and ovarian hormone. A level >50 is considered to be somewhat elevated.

### **Free Testosterone**

**Time of Test: Day 3 - Normal Range: 0.7-3.6 pg/ml**

### **Dydroepiandrosterone Sulfate (DHEAS)**

**Time to Test: Day 3 - Normal Range: 35-430 ug/dl**

- An elevated DHEAS is often seen in PCOS.
- Levels improve when working with insulin-sensitizing medications and herbs.

### **Sex Hormone Binding Globulin (SHBG)**

**Time to Test: Day 3 - Normal Range: 18-114 nmol/l**

- Increased androgen production often leads to lower SHBG levels.

### **17 Hydroxyprogesterone**

**Time to Test: Day 3 - Normal Range: 20-100 ng/dl**

- Mid cycle peak would be 100-250 ng/dl, luteal phase 100-500 ng/dl

### **Fasting Insulin**

**Time to Test: 8-16 hours after fasting - Normal Range: <30 mIU/ml**

- The normal range here is incomplete information. A fasting insulin of 10-13 generally indicates some insulin resistance, with levels above 13 indicating greater insulin resistance.

## **ADVANCED / INVASIVE FERTILITY TESTS**

### **Sonohysterogram / Saline Ultrasound**

- The sonohysterogram is a procedure in which saline is injected into the uterus while an ultrasound is performed. It is used to look for polyps, fibroids and other uterine abnormalities.

### **Endometrial Biopsy**

**Time of Test: 2nd half of cycle just a few days before menstruation is expected.**

- An endometrial biopsy is used to “date” the lining of the uterus to see if it is out of sync hormonally.
- It is considered out of phase if the lining appears to be more than 2 days off.
- It is common to repeat the biopsy in another cycle, if it is found to be out of phase, before a diagnosis of a luteal phase defect is made.

### **Hysterosalpingogram (HSG)**

**Time of Test: in 1st half of menstrual cycle between days 7-10.**

- An HSG utilizes dye injected into the uterus to look for anatomic problems, such as tube patency (how open the fallopian tubes are), fibroids, polyps, or structural problems with the uterine cavity.

### **Hysteroscopy (HSC)**

**Time of Test: timing varies.**

- **Alone is may be done at the beginning of a cycle.**
- **With a laparoscopy it is usually done around ovulation**
- **With a biopsy it would be performed a few days before the menstrual cycle.**
- A hysteroscopy is done under local or general anesthesia. The cervix is dilated in order to insert a tiny scope which the doctor uses for viewing the inside of the uterus. Often carbon dioxide gas is used to expand the uterus for better visualization.
- Minor abnormalities may be fixed during this procedure, and it is sometimes done in conjunction with a laparoscopy, hysterosalpingogram, and/or an endometrial biopsy.

### **Laparoscopy (Lap)**

- A laparoscopy is done to look for endometriosis, adhesions and organ malformations. The patient is usually under general anesthesia. Carbon dioxide gas is used to expand the abdominal cavity to provide better visualization.
- The doctor inserts a scope through a small incision inside the navel or just below it to view the outside of the uterus, ovaries and fallopian tubes. Often a second incision is made lower in the abdomen through which an instrument is inserted to gently manipulate the organs to allow the scope to examine different angles.
- If found, endometriosis and adhesions may be removed during this surgery.

### **Dilation & Curettage**

- A D&C begins with dilating the cervix. An instrument with a vacuum tube is attached is inserted and the uterus is both scraped and vacuumed.
- The procedure is often done in conjunction with a hysteroscopy, or to resolve a miscarriage.