Hormone Levels & Fertility Bloodwork

Please note that all labs have their own normal values, and those presented in these charts are just an average. These charts are provided as a tool to help patients have a better dialog with their doctors, not for self-diagnosis or as a substitute for medical care.

Female Hormone Levels

Hormone to Test	Time to Test	Normal Values	What Value Means
Follicle Stimulating Hormone (FSH) Tests *number*, not *quality* of follicles FSH:LH → 1:1 If LH is higher, may be PCOS	**Day 3**	3-20 mIU/ml 4-7: Excellent 7-9: needs IVF 10-14: Poor Ovarian Reserve	FSH is often used as a gauge of ovarian reserve. In general, under 6 is excellent, 6-9 is good, 9-10 fair, 10-13 diminished reserve, 13+ very hard to stimulate. In 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. If FSH:LH = 2.5 or higher, may indicate low ovarian reserve
Estradiol (E2)	**Day 3**	25-75 pg/ml <20: menopausal 25-55: Ideal	Levels on the lower end tend to be better for stimulating. Abnormally high levels on day 3 may indicate existence of a functional cyst or diminished ovarian reserve.
Estradiol (E2)	Day 4-5 of meds	100+ pg/ml or 2x Day 3	There are no charts showing E2 levels during stimulation since there is a wide variation depending on how many follicles are being produced and their size. Most doctors will consider any increase in E2 a positive sign, but others use a formula of either 100 pg/ml after 4 days of stims, or a doubling in E2 from the level taken on cycle day 3.
Estradiol (E2)	Surge/hCG day	200 + pg/ml	The levels should be 200-600 per mature (18 mm) follicle. These levels are sometimes lower in overweight women.
Luteinizing Hormone (LH) FSH:LH → 1:1 If LH is higher, may be PCOS	**Day 3**	< 7 mIU/ml	A normal LH level is similar to FSH. An LH that is higher than FSH is one indication of PCOS.
Luteinizing Hormone (LH)	Surge Day	> 20 mIU/ml	The LH surge leads to ovulation within 48 hours.
Prolactin	**Day 3**	< 24 ng/ml	Increased prolactin levels can interfere with 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)	**Day 3**	< 1.5 ng/ml	Often called the follicular phase level. An elevated level may indicate a lower pregnancy rate.

Progesterone (P4)	7 dpo	> 15 ng/ml	A progesterone test is done to confirm ovulation. When a follicle releases its egg, it becomes what is called a corpus luteum and produces progesterone. A level over 5 probably indicates some form of ovulation, but most doctors want to see a level over 10 on a natural cycle, and a level over 15 on a medicated cycle. There is no mid-luteal level that predicts pregnancy. Some say the test may be more accurate if done first thing in the morning after fasting.
Thyroid Stimulating Hormone (TSH)	**Day 3**	.4-4 uIU/ml >2.0 indicates sub-clinical hypothyroid	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 have an effect on fertility.
Free Triiodothyronine (T3)	**Day 3**	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. Therefore measurement of both hormones provides an even more accurate evaluation of thyroid function.
Free Thyroxine (T4)	**Day 3**	.8-2 ng/dl	A low level may indicate a diseased thyroid gland or may indicate a non-functioning pituitary gland which is not stimulating the thyroid to produce T4. If the T4 is low and the TSH is normal, that is more likely to indicate a problem with the pituitary.
Total Testosterone	**Day 3**	6-86 ng/dl	Testosterone is secreted from the adrenal gland and the ovaries. Most would consider a level above 50 to be somewhat elevated.
Free Testosterone	Day 3	.7-3.6 pg/ml	
Dehydroepiandrosterone Sulfate (DHEAS)	Day 3	35-430 ug/dl	An elevated DHEAS level may be improved through use of dexamethasone, prednisone, or insulin-sensiting medications.
Androstenedione	Day 3	.7-3.1 ng/ml	
Sex Hormone Binding Globulin (SHBG)	Day 3	18-114 nmol/l	Increased androgen production often leads to lower SHBG
17 Hydroxyprogesterone	Day 3	20-100 ng/dl	Mid-cycle peak would be 100-250 ng/dl, luteal phase 100-500 ng/dl
Insulin (fasting)	8-16 hours fasting	< 30 mIU/ml	The normal range here doesn't give all the information. A fasting insulin of 10-13 generally indicates some insulin resistance, and levels above 13 indicate greater insulin resistance.

Blood Glucose Levels

Type of Test	Time to Test	Normal Values	What value means
Fasting Glucose	8-16 hours fasting	70-110 mg/dl	A healthy fasting glucose level is between 70-90, but up to 110 is within normal limits. A level of 111-125 indicates impaired glucose tolerance/insulin resistance. A fasting level of 126+ indicates type II diabetes.
Glycohemoglobin / Glycosylated Hemoglobin (HbA1c)	anytime	< 6 %	An HbA1c measures glucose levels over the past 3 months. It should be under 6% to show good diabetic control (postprandial glucose levels rarely going above 120). Good control reduces the risk of miscarriage and birth defects.

Glucose Tolerance Test with Insulin (GTT / IGTT)

Time	Normal Glucose Values	Normal Insulin Values	What the Results Mean
Fasting	< 126 mg/dl	< 10 mIU/ml	Normal glucose results are 70-90, 111 or over is impaired, 126 or over is diabetic. Insulin levels above 10 show insulin resistance.
? hour	< 200 mg/dl	40-70 mIU/ml	A truly normal glucose response will not exceed 150.
1 hour	< 200 mg/dl	50-90 mIU/ml	Some want to lower the threshold on glucose to < 180 to identify early stages of diabetes. Insulin > 80 shows insulin resistance, or a level 5 times that of the fasting level (i.e., a fasting of 11 followed by a 1 hour > 55)
2 hours	< 140 mg/dl	6-50 mIU/ml	A truly normal glucose response is 110 or lower. Insulin > 60 is IR.
3 hours	< 120 mg/dl		
4 hours	< 120 mg/dl		

Cholesterol, Triglycerides and C-Peptide

What to Test	Time to Test	Normal Values	What value means
Triglycerides (TG)	8-16 hours fasting	< 200 mg/dl	Borderline high is 200-400, high is 400-1000, and very high is >1000. Elevated levels are a risk factor for coronary artery disease.
Cholesterol Total	8-16 hours fasting	< 200 mg/dl	A level of 200-239 is borderline high, and a level 240+ is high. Increased levels are associated with increased risk of heart disease.
Low-density lipoprotein cholesterol (LDL)	8-16 hours fasting	< 160 mg/dl	This is the "bad" cholesterol. In someone with one risk factor for heart disease, < 160 is recommended, with 2 risk factors < 130, and those with documented coronary heart disease the target is < 100
High-density lipoprotein cholesterol (HDL)	8-16 hours fasting	> 34 mg/dl	This is the "good" cholesterol which may be increased through a healthy diet and exercise. The HDL level is usually estimated by taking total cholesterol and subtracting LDL, rather than by direct measure.
C-peptide	8-16 hours fasting	0.5 to 4.0 ng/ml	Levels increase with insulin production.
Creatinine		< 1.4 mg/dl	*Levels 1.4 mg/dl and higher may indicate renal (kidney) disease or renal dysfunction.*

Male Hormone Levels

Hormone to Test	Normal Values	What value means
Testosterone	270-1100 ng/dl	Testosterone production is stimulated by Leydig cells in the testicles. Low levels of testosterone combined with low FSH and LH are diagnostic of hypogonadotropic hypogonadism.
Free Testosterone	.95-4.3 ng/dl	
% Free Testosterone	.3% - 5%	A normal male has about 2% free, unbound testosterone
Follicle Stimulating Hormone (FSH)	1-18 mIU/ml	Basic hormone testing for males often only includes FSH and testosterone.
Prolactin	< 20 ng/ml	A level two or three times that of normal may indicate a pituitary tumor, such as a prolactinoma, which may lead to decreased sperm production. Elevations can be treated with bromocriptine.
Luteinizing Hormone (LH)	2-18 mIU/ml	LH stimulates Leydig cells and production of testosterone. A problem with LH levels alone is rarely seen, so testing is only needed if testosterone level is abnormal.
Estradiol (E2)	10-60 pg/ml	
Progesterone (P4)	.3-1.2 ng/ml	