Meridian Valley LAB

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CLIA # 50D0630590

Age Management Panel

Female Fasting Panel

Doctor ID	Patient Name			
9999	DOE, JANE			
Age	**Sex**	**Test ID**	**Accession #**	**Test Code**
55	F		999999	
Date Collected		**Date Received**	**Date Reported**	**Tech**
01/01/07		01/02/07	01/06/07	ZT
Comments				
SAMPLE REPORT				

Doctor Name and Address

DR AGE WRIGHT
ANYTOWN, USA

TEST	RESULT		UNITS	RANGE
FASTING INSULIN	5		µIU/mL	0 - 30
IGF-1	250	L	ng/mL	308 - 1138
IGFBP-3	5.2		µg/mL	age 20 - 50 3.4 - 6.7
				age 51+ 3.2 - 6.6
ESTRADIOL	120		pg/mL	follicular phase -ND-160
				follicular phase days 2-3-ND84
				periovulatory, ± 3 days -34-400
				luteal phase -27-246
				untreated postmenopausal -ND-30
				treated postmenopausal -ND-93
				oral contraceptives -ND-102
TOTAL TESTOSTERONE	65		ng/mL	14 - 76
FREE TESTOSTERONE	2.5		pg/mL	females-0-2.72
				follicular phase-0-3.46
				luteal phase-0-2.58
				OC 0.16-2.2
				postmenopausal-0.11-2.07
SHBG	29		nmol/L	18 - 114
ALBUMIN	4.3		g/dL	age 20 - 59 3.5-5.2
				age 60 - 90 3.2-4.6
BIOAVAILABLE TESTOSTERONE	29.8	H	ng/dL	premenopausal 1.9-22.8
				postmenopausal 1.6-19.1
PROGESTERONE	18		ng/mL	follicular-0.32-2.0
				midcycle-0.77-2.3
				luteal-1.9-21.6
				midluteal days 7-8 4.4-28

Physician support available. Please call 425.271.8689 to schedule your free consultation.

www.meridianvalleylab.com

Patient Name	
DOE, JANE	
Test ID	Accession #
	999999

TEST	RESULT		UNITS	RANGE
DHEA-S	150		µg/mL	premenopausal-13-361
				postmenopausal-29-190
HOMOCYSTEINE	13	**H**	µmol/L	5.0 - 12.0
hs C-REACTIVE PROTEIN	0.5		mg/dL	0 - 1.1
FREE T3	2		pg/mL	1.8 - 3.9

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Patient Name: Doe, Jane **Accession #: 999999**

AGE MANAGEMENT PANEL™
Interpretive Commentaries

Fasting Insulin

H - Elevated fasting insulin levels are indicative of insulin resistance, a precursor of non-insulin dependent diabetes. Fasting insulin can also be elevated in cases of pancreatic beta cell tumors (insulinoma).

L - Not Indicative.

Insulin-like Growth Factor – I (IGF-I)

IGF-1 is produced primarily by the liver as an endocrine hormone impacting target tissues in a paracrine/autocrine fashion. Its primary action is mediated by binding to specific IGF receptors present on many cell types in many tissues. The signal is transduced by intracellular events. IGF-1 is one of the most potent natural activators of the AKT signaling pathway, a stimulator of cell growth and multiplication and a potent inhibitor of apoptosis. Almost every cell in the human body is affected by IGF-1, especially cells in muscle, cartilage, bone, liver, kidney, nerves, skin, and lungs. In addition to the insulin-like effects, IGF-1 can also regulate cell growth and development, especially in nerve cells, as well as cellular DNA synthesis

IGF-I is routinely tested to identify diseases and conditions caused by deficiencies and overproduction of growth hormone (GH), to evaluate pituitary function, and to monitor the effectiveness of GH treatment.

H - Growth hormone supplementation
Pituitary tumor
Acromegaly

L - **Malnutrition**
Growth hormone insensitivity
Lack of growth hormone receptors
Signaling pathway disruption
Hypopituitarism
Dwarfism
Hypothyroidism
Kwashiorkor
Hepatocellular disease, cirrhosis
Anorexia
Emotional deprivation syndrome

IGFBP-3

Insulin-like growth factor binding proteins bind IGF-I and IGF-II with high affinity but do not bind insulin. There have been six distinct IGF binding proteins structurally identified at this time; however, IGFBP-3 has been demonstrated to be the major transporter of IGF-I and IGF-II, transporting approximately 95% of the two hormones. IGFBP-3 is growth hormone (GH) dependent and therefore useful in the evaluation of GH secretion.

The IGFBP-3 assay is useful in determining nutritional status, because IGFBP-3 decreases with both caloric and protein restriction.

Hypertensive individuals with concomitant high IGFBP-3 values have been associated with a nine-fold risk increase for carotid arteriosclerosis.

Estradiol (E2)

Estradiol is a steroid hormone produced primarily by the ovary and peripheral tissues such as cutaneous fat and skin in females, and the testes in men. It is considered to be the most active of endogenous estrogens. Testosterone and DHEA may also be aromatized in the tissues to estradiol. It may be converted to estrone or estriol in the body. In females, levels vary depending on menstrual cycle phase.

H - **hormone supplementation (estrogen, DHEA, testosterone, pregnenolone)**
Estrogen producing tumors (men and women)
Testicular feminization syndrome
Precocious puberty related to adrenal tumors
Hepatic cirrhosis
Hyperthyroidism

In females, during menses, preovulation, and during the 23rd to 41st week of pregnancy

L - Primary and secondary hypogonadism
Kallman syndrome
Anorchia, primary testicular failure
Hypofunction or dysfunction of the pituitary and adrenal glands
Menopause

Testosterone, Free and Total

Testosterone is secreted by the testes and adrenal glands in men, and by the adrenal glands and ovaries in women. Testosterone exists in the serum both free and bound to albumin and sex hormone binding globulin. Unbound (free) testosterone is the physiologically active form.

Total testosterone

H - Women: Adrenal neoplasms
Ovarian tumors, benign or malignant
Trophoblastic disease during pregnancy
Idiopathic hirsuitism
Hilar cell tumor
Testosterone or DHEA supplementation

L - Women: Menopause
Hypopituitarism (primary and secondary)

Free testosterone

H - Women: Hirsuitism
Polycystic ovaries
Virilization
Testosterone supplementation

L - Women: Menopause
High SHBG
Steroids

SHBG - Sex hormone binding globulin

This is also known as testosterone binding globulin, but also binds estrogens with lower binding constants. It is a protein that has one androgen binding site per molecule. In the serum, about 2% of testosterone is free, and 44% is bound to SHBG, the other 54% is bound to albumin. The fraction of testosterone bound to SHBG is proportional to the amount of SHBG. Estadiol is also bound to SHBG, though with less affinity. Testosterone supplementation has a suppressive effect on circulating SHBG levels while estrogen supplementation has a stimulative effect.

H - estrogen supplementation, specifically oral, synthetic estrogens
Females have higher levels than men
Hypogonadal men
Thyroid hormone excess

L - testosterone supplementation
Hypothyroidism

Albumin

Albumins are a group of proteins that constitutes roughly {60%} of the plasma proteins. It is the most abundant protein important in transporting fatty acids, thyroid hormones, some steroid hormones (i.e. testosterone in a dissociable manner), and other substances.

H - IV infusions
Dehydration
(elevated hemoglobin and hematocrit indicate higher albumin levels)

L - Liver disease
Alcoholism
Malabsorption syndromes
Crohn's disease
Protein losing enteropathy
Starvation states
Congenital analbuminemia
Nephrotic syndrome
Burns (third degree)

Bioavailable Testosterone (calculated)

Bioavailable testosterone (non-SHBG testosterone) is a calculated value thought to most accurately reflect the amount of Testosterone available to the tissues. It is calculated from the levels of Total Testosterone, SHBG, and albumin.

Testosterone bound weakly to albumin is considered readily dissociable, while the fraction bound to SHBG is not tissue available. Bioavailable testosterone is computed from the levels of these analytes and is believed to be a truer indicator of testosterone status than free testosterone. [1A]

1A. ***"J Clin Endocrinol Metab 84:3666-3672, 1999 – A critical evaluation of simple methods for the estimation of free testosterone in serum"***

Progesterone

Female sex hormone, primarily involved in the preparation of the uterus in pregnancy, and maintenance in pregnancy. Progesterone peaks in the midluteal phase of the menstrual cycle. In pregnancy, progesterone is produced by the placenta, in non-pregnant females, progesterone is produced by the corpus luteum. In men, it is produced by the testes.

H - Progesterone supplementation
Pregnenalone supplementation
Congenital adrenal hyperplasia
Lipid ovarian tumor
Molar pregnancy
Chorionepithelioma of ovary

L - Threatened abortion
Galactorrhea-amenorrhea syndrome
Menopause

DHEA-S

DHEA-S originates almost exclusively in the adrenal glands, although some may be derived from the testes, none is produced by the ovaries. DHEA-S is weakly androgenic but is metabolized in peripheral tissues to testosterone and dihydrotestosterone. Serum levels of DHEA-S are > 1000X those of DHEA and 10 times those of cortisol. Unlike DHEA, DHEA-S does not exhibit a marked diurnal variation and has a low clearance rate. Unlike testosterone, DHEA-S does not circulate bound to sex hormone. DHEA-S levels in men and women decline progressively with age.

H - Supplementation of DHEA
Hyperplasia of adrenal gland
Adrenocortical tumor (adrenal malignancy)
Cushing's Disease
Polycystic ovarian syndrome (PCOS)

L - **Peripheral tissue conversion to testosterone/estradiol**
Gradual decline with age (peaks between 20 and 30 years of age)
Low adrenal function
Hypopituitarism
Addison's Disease

Homocysteine

H - **Elevated homocysteine is an independent risk factor for cardiovascular disease. It is also used as a functional test for vitamin B_{12}, folate, and/or vitamin B_6 deficiency (when homocysteine is high, vitamin supplementation is recommended).**

Individual variability is ~8% over a one year period, although it can be up to 25% in patients with hyperhomocysteinemia. Generally, one measurement is considered sufficient to determine homocysteine relevance.

L - **Homocysteine values can be low due to Down syndrome, pregnancy, hyperthyroidism, and early diabetes.**

C-Reactive Protein, high sensitivity, hs-CRP

H - **CRP levels in serum may rise during general, nonspecific response to infectious or non-infectious inflammatory conditions such as cardiovascular disease, rheumatoid arthritis, or peripheral vascular disease. CRP is synthesized in the liver and is normally present in trace quantities.**

24 to 48 hours after acute tissue damage, production of CRP rises dramatically, up to approximately 1000 times the constitutive level.

As elevated CRP levels are always associated with pathological changes, the CRP values provide useful information in the diagnosis, intervention, and monitoring of inflammatory conditions and diseases. However, it is not indicative any specific inflammatory condition and should be used in context of a constellation of other indicators.

L - **CRP does not produce a meaningful Low indication.**

Free T3

This value measures the circulatory T3 that exists in the free state in the blood, unbound to protein. This value is used to rule out T3 toxicosis, hypothyroidism, and hyperthyroidism. It is also an important factor in determining appropriate thyroid supplementation.

H - Hyperthyroidism
T3 toxicosis
Peripheral resistance syndrome

L - Hypothyroidism
3rd trimester of pregnancy