



Meridian
Valley LAB

2017-2018



Compendium of Services

Leader in preventive medicine since 1976



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Meet Our Newest Test...

CompletePlus Dry Urine Hormone Profile

Our new test combines the benefits of a 24-hour urine test with the time-specific advantages previously available only in a saliva test. Our dried urine hormone test combines the advantages of these two well-established methods by giving you hormone metabolites, previously only available in a 24-hour urine test, and offers 4-point cortisol and cortisone like saliva testing. The CompletePlus profile* includes a full complement of estrogen, progesterone, and androgen metabolites, as well as the most comprehensive evaluation of adrenal function available on the market.

Estrogen
Metabolites



The estrogen portion of the profile provides a detailed understanding of your patient's estrogen metabolism including:

- Detoxification pathways
- Indicators of risk for osteoporosis
- Indicators of risk for estrogen-related cancers

This is the only dry urine panel to include 2-Methoxyestradiol, the most protective of the estrogen metabolites.

Androgen
Metabolites



Accurate assessment of true bioavailable androgen levels:

- DHEA
- Testosterone
- Androgen metabolites, including 5 α -DHT

COMPLETE
Adrenal Profile



A complete picture of adrenal health including:

- Adrenal metabolites
- Mineralocorticoids
- Circadian cortisol/cortisone pattern
- Free and conjugated cortisol and cortisone for the best assessment of bioavailable hormone

Unlimited
FREE Consults



Free telephone consultations with our highly trained staff physicians.

Fast
Turnaround



Turnaround times that are some of the fastest in the industry.

*Smaller profiles available

For more information about this test, see pages 14-15.

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CUSTOMER SERVICE

At Meridian Valley Lab, our dedicated and friendly customer service team is here to help you with any questions you may have about account set up, kit orders, specimen collection and shipping instructions.

Test Information

Test information is available throughout this compendium and also available on our website at MeridianValleyLab.com. Setting up an online account will give you access to the most up-to-date pricing information, the ability to order test kits online, the ability to view our webinars and much more.

Test Kits

Test kits are always free. Free shipping to your office and expedited shipping back to the lab are included with the test. Test kits can also be shipped directly to your patients for a nominal shipping fee.

Results

All results will be sent regular via USPS unless you arrange to access results via online portal or fax.

Phone and Office hours: 6:00AM - 6:00PM PST

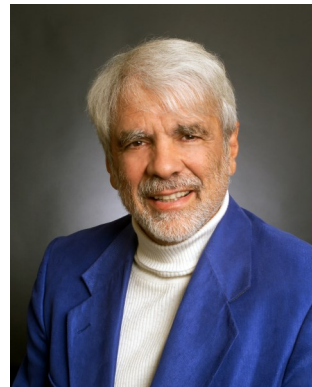
Blood draw hours: 7:30AM - 5:30PM PST

Three Ways to Order Test Kits:

- Call Customer Service at **855.405.8378** Toll Free or **206.209.4200**
- Go to www.MeridianValleyLab.com and log in to your practitioner account. Click on the Test Kit Request tab in the upper left corner and order online.
- Complete a Test Kit Request form and **FAX to 206.209.4211**. Test Kit Request form can be found in your welcome packet or printed out from the Test Kit Request tab on the website.

About this Compendium:

We are always working to update and upgrade our testing services. Late breaking changes may not be reflected in this Compendium.



A Message from the Medical Director

Welcome to Meridian Valley Laboratory, a clinical testing facility dedicated to providing the most accurate and informative data for patient diagnosis and therapeutic monitoring. Meridian Valley Laboratory offers clinical expertise in the areas of analytical chemistry, heavy metal determination, microbiology, endocrinology and immunology.

The core values at MVL are quality and accuracy. MVL staff at all levels of the company are fully qualified, conscientious, and interested in providing the best laboratory services. Most importantly, they are interested in you and your patients.

MVL applies rigorous internal quality control and quality assurance measures. We participate in the proficiency testing services of the College of American Pathologists (CAP) and the American Association of Bioanalysts (AAB). MVL is licensed by the State of Washington. Washington State standards meet and exceed federal laboratory standards, making it a "CLIA-exempt" state, one of only two states to be awarded this status.

I am proud and privileged to be part of the MVL team in caring for your patients.

Sincerely,

Jonathan V. Wright, M.D.
Medical Director

Accreditation

Meridian Valley Lab is a CLIA certified clinical laboratory.
CLIA # 50D0630590

Proficiency Testing Programs:

College of American Pathologists (CAP)
American Association of Bioanalysts (AAB)

PAYMENT POLICIES & PROCEDURES

Domestic Billing (including Canada):

Meridian Valley Lab (MVL) is pleased to offer two billing options to meet the needs of your practice.

Option 1: Patient Prepay

Patients are responsible for sending in payment which must be enclosed with the specimen. Patients pay the price listed on the MVL price list. Payments may be made by check or by credit card (Visa, MasterCard, American Express, and Discover Card only). If payment is not included along with the specimen, the patient will be contacted for payment and lab reports will be put on "hold" until arrangements have been made with MVL's accounting department. In the case of drop-shipment of test kits to patients, MVL must receive the shipping fee before kits are shipped.

Option 2: Bill Practitioner

Patients pay the practitioner directly for tests. Practitioners pay the price listed on the MVL price list. Practitioners may up-charge tests to patients if allowed in their state or province. This option allows payments to be made from either statement or invoices. Payment need not be sent up front with the specimen. Terms are net 30 days. Payments can be made by check or by credit card (MasterCard, Visa, American Express, and Discover Card only). Physician is responsible and liable for all account balances.

Past Due Accounts:

If an invoice becomes 60 days or \$10,000 overdue, MVL reserves the right to hold all lab results until the account is brought current. Once the account is brought current, please allow up to two business days for lab reports to be released.

International Billing (excluding Canada):

International clients are responsible for paying their own shipping, both to and from MVL (with the exception of Canada). MVL can provide international shipping to select locations via UPS at a discount. Payment arrangements must be made before kits are shipped.

Drop Shipment of Test Kits:

MVL is happy to drop-ship test kits directly to your patients. A nominal shipping charge will apply.

Medicare and Health Insurance:

MVL is not a preferred insurance provider or a Medicare participating provider. **Patients may not submit claims to Medicare.** Patients may submit a claim on their own to their private health insurance plans. Reimbursement will depend on the details and provisions of a patient's specific insurance plan.

Note Regarding Customers in New York State:

MVL is not licensed in the State of New York. Therefore, MVL cannot ship to or receive any samples from the State of New York.



GET THE MOST OUT OF YOUR RESULTS WITH A FREE 30 MINUTE CONSULTATION!

To get your free consultation, call our Customer Service department at 855.405.TEST (8378).

We can accommodate next-day scheduling!

At Meridian Valley Lab, we are committed to giving you the best possible technical assistance to support your clinical success. Our on-staff physicians have extensive clinical practice experience and training in interpreting our portfolio of tests, particularly our 24-Hour Urine and Dried Urine Hormone tests.

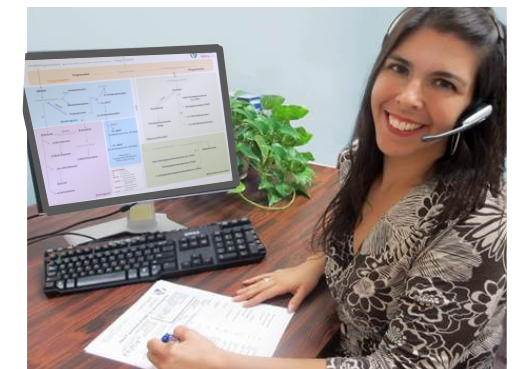
Every profile you order from us entitles you to a no-cost, 30-minute telephone consultation with one of our staff physicians.

We tailor consultations to meet your needs and will:

- Thoroughly review your patient's report.
- Discuss potential therapeutic options based on your patient's clinical picture.
- Explain relevant metabolic pathways.

Written Interpretations

Written interpretations can be provided for an additional fee. These are useful for the busy clinician who may not have time for phone consultations or for those who co-manage patients with other physicians who are not familiar with our tests.



MVL Consulting Physicians help you make the best use of your patients' lab results.

ALLERGY

Meridian Valley Lab offers a variety of food and inhalant allergy test options. We are proud to have led the field by being the first commercial lab to apply the state-of-the-art ELISA* method to food allergy testing. Our tests have proven to yield unsurpassed reproducibility and consistency since their introduction in 1976. Doctors and patients alike have reported excellent clinical results with the removal of offending foods identified in our panels.

Serum Food Allergy Panels 2011/2070/2200

The E-95 Food Allergy Panel tests for antibodies to 94 commonly eaten foods and screens for antibodies to *Candida albicans*. The A-95 Food Allergy Panel tests for antibodies to an additional 95 common, but less frequently eaten, foods along with herbs and spices. The panels can be ordered individually or as a combined panel for a total of 190 antigens. The E-95 and A-95 panels require a blood draw and measure both IgG₄ and IgE antibodies. Antibody levels for each food are reported and further characterized as "Low" reactivity, "Moderate" reactivity, or "High". A customized food rotation diet is included with each test. See page 5 for included foods.

E-95 Basic Food Panel	2011
A-95 Extended Food Panel	2070
Combo E-95 & A-95 Panel	2200

Sample Reports, pages 44-49

FoodSafe Bloodspot Food Allergy Panels 2052/2062/2060

The FoodSafe Panel is a bloodspot panel that measures antibodies to the same foods included in the E-95 and A-95 serum panels. The FoodSafe Panel was developed specifically for use in clinics where blood draw facilities are unavailable and for use in pediatric populations. This test requires a finger stick and measures only IgG₄ antibodies. Antibody levels for each food are reported and further characterized as "Low" reactivity, "Moderate" reactivity, or "Avoid" entirely. A customized rotation food diet is included with each test. See page 5 for included foods.

FoodSafe Basic Food Panel	2052
FoodSafe Extended Food Panel	2062
FoodSafe Combo Panel	2060

Same Report Format as Serum Panels, see pages 44-49

Inhalant Allergy Panels 2015

Meridian Valley Lab offers five regionally-specific inhalant panels for the United States and Canada, including trees, grasses, weeds, animals, dust, and molds. These panels require a blood draw and measure IgE antibodies. While inhalant allergies often cannot be avoided altogether, knowledge of allergens can help minimize exposure and open up treatment options for desensitization. Inhalant allergies often improve when patients eliminate foods that may also provoke an immune response. See page 6 for inhalant panel regions.

Food/Inhalant Combination Panel 2080

For more complete and cost-effective testing, Meridian Valley offers the Food and Inhalant Allergy Combination Panel. This panel includes the E-95 and A-95 food allergy panels (190 foods, total) and one regional Inhalant Allergy Panel. See pages 5-6 for included foods and inhalant panel regions.

Indications for Allergy Testing

- Fatigue
- Constipation
- Diarrhea
- Irritable bowel syndrome (IBS)
- Inflammatory bowel disease (IBD)
- Suspected celiac disease
- Acid reflux/GERD
- Other GI complaints
- Dermatological conditions
- Asthma
- Rhinitis
- Frequent URIs
- Ear infections
- Other respiratory symptoms
- Headaches/migraines
- Autism spectrum disorders
- Learning disorders/ADHD
- Depression
- Anxiety
- Weight gain
- Other mood and psychiatric disorders
- Joint pain
- Blood sugar abnormalities
- Autoimmune disease
- Neurological problems
- Fibromyalgia
- Menstrual pain
- PMS
- Incontinence
- Fluid retention

Meridian Valley Lab Allergy Panels

Panel Name	E-95	A-95	Combo E-95 A-95	FoodSafe Basic	FoodSafe Extended	Foodsafe Combo	Inhalant	Food/Inhalant Combo
Test Code	2011	2070	2200	2052	2062	2060	2015	2080
Antibodies Measured	IgG4 IgE	IgG4 IgE	IgG4 IgE	IgG4	IgG4	IgG4	IgE	IgG4 IgE
Methodology	ELISA	ELISA	ELISA	ELISA	ELISA	ELISA	ELISA	ELISA
Specimen	Serum	Serum	Serum	Bloodspot	Bloodspot	Bloodspot	Serum	Serum
Turn-around Time	10-14 business days							

Collection Notes:

Patients should eat a wide range of foods for three weeks before testing. *It is not recommended that patients consume foods to which they have a known reaction.* The following medications can interfere with testing and should be avoided for 14 days prior to collection unless otherwise directed by the health care provider:

- Anti-inflammatories
- Prednisone and other corticosteroids
- Antihistamines – including eye drops
- Inhalers

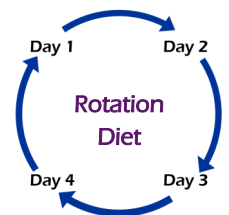
Lipemic or hemolyzed specimens are not acceptable for inhalant panels.

Patient Support Materials

Both our serum and blood spot test results come to you with materials to that can make it easier for your patients to implement changes in their eating habits:

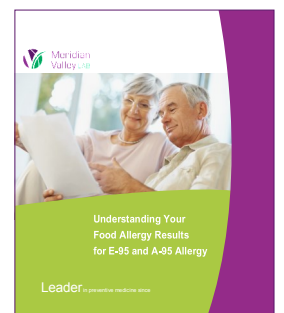
Rotation Diet

- Groups foods into food families which can be used as a four-day rotation guide
- Increases variety and decreases exposure to potential allergens
- Customized to your patient's results: foods of "Low" and "Moderate" reactivity are included in the rotation, while foods of "High" reactivity are excluded



"Understanding Your Food Allergy Results" patient guide:

- Explains what the test is measuring
- Answers some commonly asked questions
- Introduces the concept of a rotation diet
- Includes helpful suggestions for managing food sensitivities
- Lists possible food substitutions for common allergenic foods
- . . . and more



E-95 and FoodSafe Basic Food Panels

Almond	Cod	Lemon	Pumpkin Seed
Apple	Coffee	Lentil	Quinoa
Apricot	Corn	Lettuce	Raspberry
Asparagus	Cottage cheese	Lima Bean	Rice
Avocado	Cow's milk	Lobster	Salmon
Baker's yeast	Crab	Mozzarella cheese	Sardine
Banana	Cranberry	Mushroom	Sesame
Barley	Cucumber	Oat	Shrimp
Beef	Egg white	Olive	Sole
Beet	Egg yolk	Onion	Soy
Blueberry	English walnut	Orange	Spinach
Brewer's yeast	Garlic	Oyster	Strawberry
Broccoli	Gliadin	Papaya	Sunflower seed
Buckwheat	Gluten	Pea	Teff
Buffalo	Goat's milk	Peach	Tilapia
Cabbage	Grape	Peanut	Tomato
Cane Sugar	Grapefruit	Pear	Trout
Carrot	Green bean	Pecan	Tuna
Casein	Green pepper	Pineapple	Turkey
Cauliflower	Hemp	Plum	Watermelon
Celery	Halibut	Pork	Wheat
Cheddar cheese	Honey	Potato, white	Whey, New Zealand
Chicken	Kidney bean	Pumpkin	Xanthan Gum
Clam	Lamb	<i>Candida albicans</i> screening test	

The E-95 and FoodSafe Basic Food Allergy panels test for reactions to 94 commonly eaten foods and screen for antibodies to *Candida albicans*.

The E-95 Panel tests both IgG₄ and IgE. The FoodSafe Panel tests IgG₄ only.

The Candida Screen

The Candida screen detects antibodies to *Candida albicans*. Small amounts of Candida do not cause problems in a healthy person. "Moderate" or "High" on the Candida screen suggests past or current Candida overgrowth. The Microbial Organic Acids Test (MOAT), tests for the presence of waste products from Candida and is a good confirmatory test. Meridian Valley Lab studies have found a strong correlation between antibodies on the Candida Screen and Candida-related waste products levels on the MOAT. See page 33 for more information.

A-95 & FoodSafe Extended Food Panels

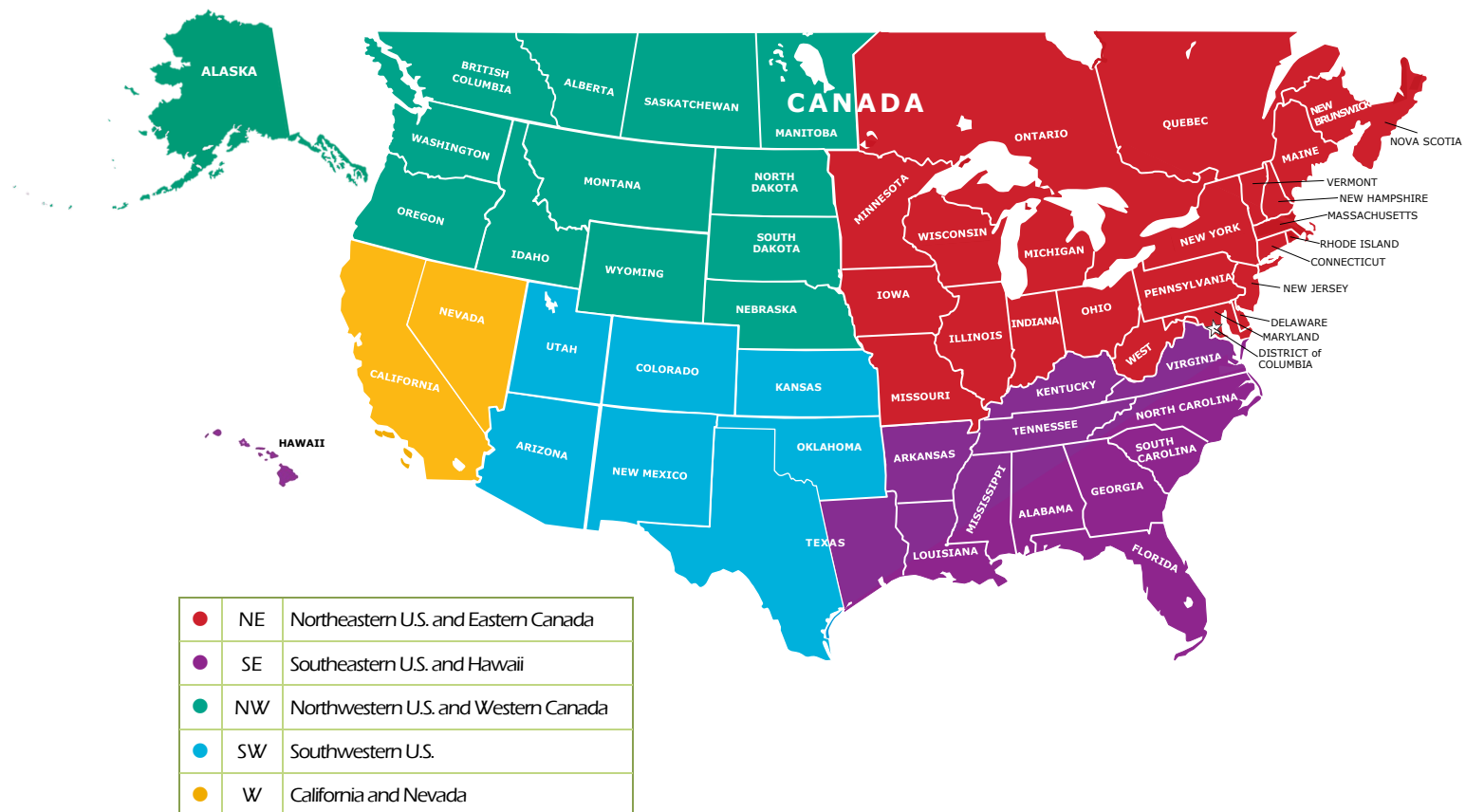
Alfalfa sprouts	Cinnamon	Kelp	Rhubarb
Allspice	Cloves	Kiwi	Rosemary
Amaranth	Cocoa	Kohlrabi	Rutabaga
Arrowroot	Coconut	Macadamia nut	Safflower seed
Artichoke	Coriander	Mango	Sage
Bamboo shoots	Corn starch	Maple sugar	Sheep's milk
Basil	Corn sugar	Millet	Sorghum
Bean sprouts	Cumin	Mung bean	Spearmint
Black pepper	Currants	Mustard	Sweet potato
Blackberry	Dill	Navy bean	Tapioca
Black bean	Duck egg	Nutmeg	Tarragon
Bok choy	Duck meat	Okra	Tea
Boysenberry	Eggplant	Olive, green	Thyme
Brazil nut	Endive	Oregano	Turmeric
Brown rice	Fig	Parmesan cheese	Vanilla
Brussels sprouts	Flax seed	Parsley	Venison
Butternut squash	Garbanzo bean	Peppermint	Water chestnut
Cantaloupe	Ginger	Pine nuts	Watercress
Carob	Grape, white	Pinto bean	Wild rice
Cashew	Hazelnut (Filbert)	Pistachio	Yam
Cherry	Hops	Pomegranate	Yellow squash
Chia seed	Horseradish	Poppy seed	Yogurt
Chili Pepper	Jalapeno	Psyllium seed	Zucchini
Cilantro	Kale	Radish	

The A-95 and FoodSafe Extended Food Allergy panels test for reactions to an additional 95 foods, including many herbs, spices and sweeteners.

The A-95 Panel tests both IgG₄ and IgE. The FoodSafe Panel tests IgG₄ only.

Inhalant Allergy Panels

Trees					Grasses and Weeds					Animals					Dust and Molds				
Acacia		●		●	Pine Mix	●	●	●	●	Ragweed, False			●	●	Cat	●	●	●	●
Alder, White	●				Privet	●	●	●	●	Ragweed, Short	●	●	●	●	Cockroach Mix	●	●	●	●
Ash, White	●	●	●	●	Sycamore, American	●	●	●	●	Ragweed, Western			●	●	Dog	●	●	●	●
Aspen, Quaking			●		Walnut/Hickory/Pecan Mix		●	●	●	Russian Thistle			●	●	Mite, D. farina	●	●	●	●
Beech, American	●	●			Willow, Arroyo			●	●	Sagebrush Mix			●	●					
Birch, White	●			●	Grasses and Weeds					Shadscale			●	●					
Birch/Alder Mix		●	●	●	Bahia Grass		●			Sheep Sorrel	●	●	●	●					
Box Elder, Maple	●	●	●	●	Bermuda Grass	●	●		●	Sweet Vernal Grass			●						
Cedar, Mountain		●	●	●	Burning Bush	●		●	●	Timothy Grass	●	●							
Cottonwood, Black			●	●	Cocklebur	●	●	●	●	Water Hemp			●	●					
Cottonwood, Eastern	●	●		●	English Plantain	●	●	●	●	Animals									
Elm Mix			●	●	Johnson Grass				●	Cat	●	●	●	●					
Elm, White	●	●		●	Kentucky Blue Grass				●	Cockroach Mix	●	●							
Eucalyptus				●	Lamb's Quarters	●	●	●	●	Dog	●	●	●	●					
Hickory, Shellbark	●				Marsh elder, Rough	●	●	●	●	Mite, D. farina	●	●	●	●					
Melaleuca		●			Meadow Fescue	●				Dust and Molds									
Mesquite			●		Mugwort	●			●	House Dust	●	●		●					
Mulberry Mix		●	●		Nettle	●		●		Alternaria	●	●	●	●					
Oak Mix			●	●	Orchard Grass/Cocksfoot	●				Aspergillus	●	●	●	●					
Oak, White	●	●		●	Perennial Rye Grass	●			●	Candida		●	●	●					
Olive			●	●	Pigweed	●	●	●	●	Cladosporium	●	●	●	●					



Meridian Valley Lab offers Dried Urine, 24-hour Urine, and serum assays for measuring hormones in clinical practice. Each method has its strengths and most appropriate clinical use. Meridian Valley Lab Consulting Physicians stand ready to assist in selecting the most appropriate test given your specific clinical goals.

Measuring Hormones: Urine vs. Serum vs. Saliva

Urine Hormone Testing (24-hour or dried urine)

Gas Chromatography-Mass Spectrometry (GC-MS) and Liquid Chromatography-Mass Spectrometry (LC-MS) are the state-of-the-art technologies for urine steroid assays. GC-MS is considered the "gold-standard" for measuring urine hormones in many academic and research circles. MVL pioneered the use of these technologies for clinicians in private practice.

- Urine testing offers superlative accuracy and correlates well with hormones measured in serum. This is the preferred method for monitoring patients who are on hormone replacement therapy. Urine/serum comparisons can also reveal rare steroid hormone hyper-excretion.
- Many hormones are secreted in pulsatile fashion throughout the day. Some hormones, cortisol in particular, may vary from minute to minute according to environmental and physiologic stressors. A serum test captures a "snapshot" picture of hormonal status and may reflect a peak or trough in the daily rhythm. The Dry Urine test is collected at four specific times throughout the day, while a 24-hour collection includes all urine generated in a 24-hour period. Both methods overcome the limitations of serum by providing a full day's perspective on hormonal status.
- Urine collection allows the measurement of night-time secreted hormones, such as human growth hormone and melatonin, neither of which can be adequately evaluated in a serum test.
- This method measures both free and conjugated hormones. It does not measure total or protein-bound hormones. The ability to assay conjugated hormones allows for the measurement of estriol which exists primarily in the conjugated form. Measuring combined free and conjugated hormones provides a more accurate assessment of how much hormone is actually bioavailable.
- Urine testing methodology allows the detection of a number of key steroid metabolites that have critical clinical implications. These metabolites are not available in either serum or saliva testing.
- The GC-MS/LC-MS methodologies afford a cost-effective way to measure multiple hormonal systems simultaneously.

Serum Hormone Testing

Serum hormones are best used for measuring peptide hormones and other hormones that are not easily measured in urine. Advantages include familiarity to most physicians and a blood draw collection procedure that is familiar to most patients.

- Serum hormone measurements have widely accepted, well-established reference ranges.
- Serum testing allows for the measurement of hormones that are not present or not easily detected in urine, such as TSH, SHBG, pituitary hormones, IGF-1, etc.
- Not recommended for monitoring steroid hormones as free (bioavailable) hormones and steroid metabolites are not measured.
- May be preferable for evaluating testosterone in patients with glucuronidation defects.
- Serum/urine comparisons can reveal rare steroid hormone hyper-excretion.

Saliva Hormone Testing

Although saliva testing has achieved some measure of acceptance for evaluating steroid hormones, its utility is greatly limited by the inability to measure steroid hormone metabolites. Measuring steroid metabolites is crucial for understanding hormonal imbalances and for safe and effective treatment.

- Collection of adequate volumes of saliva can be difficult in older patients.
- Anti-depressants and other commonly prescribed drugs can also change saliva production and hormone concentrations.
- Micro-bleeds in gum tissue, even in patients with good oral health, can significantly alter salivary hormonal levels, especially for testosterone.
- Antibody-based salivary testing methodology is subject to cross-reactivity, significantly reducing the specificity of saliva testing.
- Not recommended to monitor a bio-identical hormone replacement regimen. Saliva yields supra-physiologic laboratory levels when taking most exogenous hormones.

Symptoms of Hormone Excess or Deficiency

WOMEN Common Symptoms	Estrogen	Progesterone	Thyroid	Glucocorticoids	DHEA	Testosterone	Growth Hormone	Melatonin	Oxytocin
Hot flashes	✓	✓							
Night sweats	✓	✓		✓					
Headaches	✓	✓					✓	✓	✓
Hair loss	✓		✓		✓	✓			
Poor sleep	✓	✓		✓			✓	✓	
Anxiety	✓	✓	✓	✓	✓	✓			✓
Depression	✓	✓	✓	✓	✓	✓	✓	✓	✓
Stress	✓	✓	✓	✓	✓	✓	✓	✓	✓
Low libido	✓	✓	✓	✓	✓	✓			✓
Memory lapse	✓		✓	✓		✓			
Sugar cravings		✓		✓	✓	✓			
Weight gain	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased facial hair/acne	✓				✓	✓			

MEN Common Symptoms	Estrogen	Progesterone	Thyroid	Glucocorticoids	DHEA	Testosterone	Growth Hormone	Melatonin	Oxytocin
Poor stamina			✓	✓	✓	✓	✓		
Decreased muscle mass/strength					✓	✓	✓		
Neck/back pain						✓			
Low libido		✓		✓	✓	✓			✓
Decreased erections					✓	✓			✓
Sugar cravings				✓			✓		
Weight gain	✓		✓	✓	✓	✓	✓	✓	
Stress			✓	✓	✓	✓	✓	✓	✓
Apathy/burned out feeling			✓	✓	✓	✓	✓		✓
Anxiety		✓	✓	✓	✓	✓			✓
Depression		✓	✓	✓	✓	✓	✓		✓
Poor cognition	✓		✓	✓	✓	✓	✓		
Memory lapse	✓		✓	✓	✓	✓	✓		

There are many indications for evaluating hormones, of which only a few are represented here. Both deficiencies and elevations of hormones can lead to the symptoms listed on the left. Deficient or excess hormones can also be associated with increased risk for conditions such as cardiovascular disease, osteoporosis, cancer, and more.

24-HR URINE COMPREHENSIVE ULTIMATE PROFILE

HORMONES



Comprehensive ULTIMATE Hormone Profile

Doctor ID 6055	Patient Name Jane Doe	Accession # 1500	Test Code 4100
Age 46	Sex F	Date of Birth 10/16/1963	External ID: A12365
Date Collected	Date Received	Date Reported	Tech RL
Comments			

Doctor Name and Address:

SAMPLE REPORT

Amount Excreted in 24hrs	Adult Reference Range
CREATININE 0.8 gm/24hr	0.5-2.0 gm/24hr
TOTAL VOLUME 1800 mL	

STERIOD	Amount Excreted in µg/24hr	Phase	Day	Female µg/24hr
ESTRONE	22.4	Luteal	17-26	3.3 - 44.6 *
		Follicular	27-11	2.0 - 39
		Mid-Cycle	12-16	11.0 - 46
ESTRADIOL	4.5	Post Menopausal	17-26	1.0 - 7.0
		Luteal	17-26	1.4 - 12.2 *
		Follicular	27-11	1.0 - 23
ESTRIOL	7.4	Mid-Cycle	12-16	4.0 - 45
		Post Menopausal	17-26	0 - 4
		Luteal	17-26	6.1 - 32.4 *
Total Estrogens	34.3	Follicular	27-11	3.0 - 48
		Mid-Cycle	12-16	20 - 130
		Post Menopausal	17-26	0 - 30
Estrogen Quotient	0.3	Estriol / (estrone + estradiol)	17-26	10.8 - 89.2 *

2-OH ESTRONE	< 0.25	LOW	Luteal	17-26	3.8 - 38.1 *
			Post Menopausal	17-26	0.2 - 5.4 *
16α-OH ESTRONE	Below Detection Limit		Luteal	17-26	2.1 - 7.9 *
			Post Menopausal	17-26	0.15 - 3.5 *
2 / 16α Ratio	Not Calculated		Luteal	17-26	1.8 - 5.5 *
			Post Menopausal	17-26	0.8 - 5.0 *
4-OH ESTRONE	< 0.25	LOW	Luteal	17-26	0.8 - 5.9
			Post Menopausal	17-26	0.05 - 1.1
2-METHOXYESTRONE	< 0.25	LOW	Luteal	17-26	2.2 - 14.4 *
			Post Menopausal	17-26	0.3 - 4.1
2-METHOXYESTRADIOL	< 0.1		Luteal	17-26	0.1 - 2.2 *
			Post Menopausal	17-26	0.03 - 0.54

Estrogens

Estrone, estradiol and estriol comprise total primary endogenous (or bio-identically supplemented) estrogens. The Estrogen Quotient provides commentary on the relative carcinogenicity of the estrogen balance.

Estrogen Metabolites

Estrogen metabolism takes place in phase I and phase II hepatic detoxification. Estrogen metabolites collectively have a bearing on relative estrogen-sensitive cancer risk. This section also provides information about methylation and bone health. 4-OH Estrone, 2-Methoxyestrone, and 2-Methoxyestradiol are included on female reports only.

Pregnanediol

Pregnanediol is a key progesterone metabolite in the urine that corresponds tightly with progesterone status in the body.

Androgens

DHEA and testosterone, along with their metabolites, allow for complete evaluation of the patient's androgen status.

Glucocorticoids/Mineralocorticoids

Cortisol, cortisone and their metabolites provide a truer assessment of total daily glucocorticoid output. Together with mineralocorticoids, this section provides a rich analysis of adrenal health and recovery.

Human Growth Hormone (hGH)

Growth Hormone is a key anabolic mediator of tissue repair and regeneration. It plays a role in many metabolic functions, such as reducing visceral adiposity, maintaining lean muscle mass, minimizing inflammation, improving bone mineral density, decreasing cardiovascular disease mortality and enhancing the overall quality of life.

Oxytocin

Beyond its actions in pregnancy, oxytocin modulates the HPA axis. Oxytocin also influences trust, sociability, intimacy and sexual function.

Melatonin

Melatonin prepares the body for sleep, and is a powerful antioxidant. Low levels have been associated with sleep disorders and many chronic diseases such as cancer, coronary artery disease, and obesity.

Thyroid

Free thyroid hormones are readily measured in the urine and are highly correlated with clinical symptoms.

Sodium/Potassium

Urinary sodium and potassium are highly diet sensitive. Imbalances may play a role in high blood pressure.

Total Urine Nitrates (not shown)

Included only in male panels. Reflects nitric oxide (NO) pathway activity in the body. NO is a primary vasodilator and is important for cardiovascular health. NO also influences perfusion necessary for healthy erectile function.

Enzyme Activity

5α-Reductase governs androgen metabolism and provides important context for androgen excess or deficiency symptoms. Elevated 5α-Reductase activity is associated with insulin resistance, BPH, PCOS, and other conditions.

11β-Hydroxysteroid dehydrogenase II regulates the inter-conversion of cortisol (active form) and cortisone (inactive/storage form). The balance of active vs. storage glucocorticoids provides an added dimension in assessing adrenal dysregulation.



Comprehensive ULTIMATE Hormone Profile

Doctor ID 6055	Patient Name Jane Doe	Accession # 1500	Test Code 4100
Age 46	Sex F	Date of Birth 10/16/1963	External ID: A12365
Date Collected	Date Received	Date Reported	Tech RL
Comments			

Doctor Name and Address:

SAMPLE REPORT

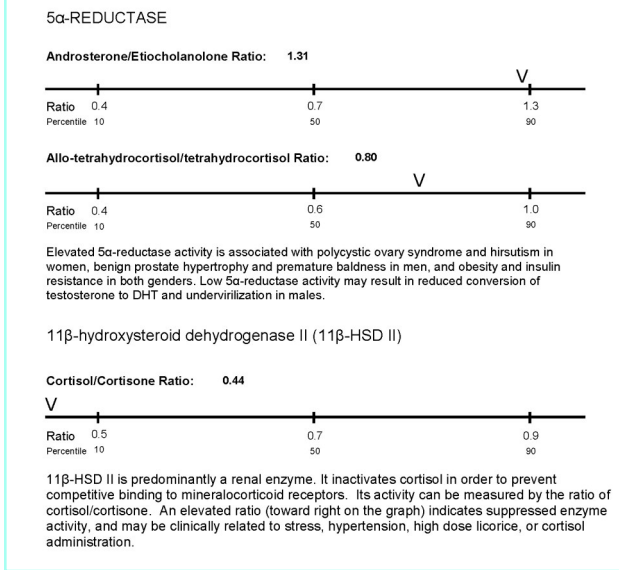
Urinary HGH	Amount Excreted in pg/24hr	Adult Reference Range
Human Growth Hormone	2652	1065 - 4722 pg/24hr
Urinary Oxytocin	Amount Excreted in pmol/24hr	Adult Reference Range
Oxytocin	215	250 - 700 pmol/24hr
Urinary Melatonin Analytes	Amount Excreted	Adult Reference Range
Melatonin	33.1	9.1 - 57.3 ng/24hr
6-Sulfatoxymelatonin	5.8	8.3 - 39.7 µg/24hr

Urinary Thyroid	Amount Excreted in ng/24hr	Adult Reference Range
Free T3	396	470 - 1750
Free T4	524	430 - 3200

Urinary Mineral	Amount Excreted in mmol/24hr	Adult Reference Range
Sodium	86	40 - 220
Potassium	41	25 - 150
Sodium/Potassium Ratio	2.1	1.2 - 4.8

Patient Name: Jane Doe	Accession #: 1500	Test ID: 419973	Test Code: 4100
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ENZYME ACTIVITY PHENOTYPE ASSESSMENT



HORMONES

24-HOUR URINE PROFILES

Meridian Valley Lab offers 24-hour urine hormone panels to meet a wide range of clinical needs, from comprehensive assessment to targeted follow-up. Our staff physicians are happy to help you determine the most appropriate panel for your patients. Several analytes are also offered as stand-alone tests or as add-on tests to other 24-hour Urine Hormone panels.

ComprehensivePLUS 4080

The ComprehensivePLUS is our most popular profile and provides both broad and in-depth evaluation of hormone balance and function. This panel measures estrogens and clinically relevant estrogen metabolites, which allow for assessment of cancer risk factors and detoxification pathways. Pregnanediol assays progesterone activity in the body. DHEA, testosterone and their metabolites provide a detailed assessment of androgen function. Cortisol, cortisone, aldosterone and their metabolites provide an industry-leading evaluation of adrenal health. Urinary free T3 and free T4 provide a sensitive gauge of thyroid hormone status. The ComprehensivePlus panel also calculates 5 α -Reductase and 11 β -Hydroxysteroid Dehydrogenase II (11 β -HSD II) enzyme activity. 5 α -Reductase is an important enzyme that governs androgen metabolism and is associated with insulin resistance and other conditions. 11 β -HSD determines the balance between cortisol and cortisone. Overall, the ComprehensivePlus provides an ideal method for assessing hormonal balance and for monitoring bio-identical hormone replacement therapy (BHRT).

The ComprehensivePLUS panel is also offered with add-on hGH, Oxytocin, or Melatonin (described on page 12):

ComprehensivePLUS with hGH	4078
ComprehensivePLUS with Oxytocin	4009
ComprehensivePLUS with Melatonin	4090

Comprehensive ULTIMATE 4100

The Comprehensive Ultimate panel is the most complete urine hormone profile available on the market. This panel includes all of the analytes contained in the ComprehensivePLUS panel, described above, with the addition of Human Growth Hormone (hGH), Oxytocin, and Melatonin.

Sample Reports: Female pages 10-11; Male, 50-53

Comprehensive 4001

The Comprehensive profile includes estrogens, progesterone, DHEA, testosterone, cortisol/cortisone, and enzyme activity with limited metabolites. This is a basic panel that looks at a broad range of hormones without the depth included in the ComprehensivePLUS panel. It is useful in cases where a full metabolite panel is not desired. Estrogen metabolites are not included in the Comprehensive panel.

Adrenal Profile 4000

The Adrenal Profile provides a focused evaluation of adrenal health, reporting DHEA, glucocorticoids (cortisol/cortisone) and mineralocorticoids (aldosterone), as well as clinically important glucocorticoid and mineralocorticoid metabolites. It is most useful as a follow-up assessment when only adrenal function requires monitoring.

Sex Hormone Profile 4002

Our basic urinary sex hormone profile measures estrogens (without metabolites), pregnanediol (progesterone marker), DHEA and testosterone.

Estrogen Profile 4061

The Estrogen Profile provides a targeted evaluation of estrogens and estrogen metabolites, similar to those reported in the higher-level ComprehensivePlus. This panel is useful as a follow-up assessment to the ComprehensivePLUS when only estrogen and estrogen metabolites require monitoring.

Individual 24-Hour Urine Hormones

Aldosterone 4075

Low aldosterone is associated with age-related hearing loss and supplementation can be helpful in reversing such loss. 24-hour urine aldosterone is available as a stand-alone test for monitoring aldosterone therapy.

Human Growth Hormone (hGH) 4076/4077

A 24-hour urine collection is an ideal way to directly measure Human Growth Hormone (hGH) due to its short half-life in the serum and predominantly night-time secretion. Symptoms of hGH deficiency can mimic other hormonal deficiency symptoms, including fatigue, weight gain and compromised healing. Recent advances have enumerated promising nutritional methods for supporting endogenous hGH.

Stand-alone Growth Hormone	4076
Add-on Growth Hormone to any other 24-hour urine hormone profile	4077

INDIVIDUAL 24-HOUR URINE HORMONES (cont'd.)

Oxytocin 4006/4007

Beyond pregnancy and lactation, recent research has brought to light a new understanding of oxytocin actions in many other body systems. Oxytocin has been shown to modulate the stress response and contributes to pain perception in chronic pain syndromes. Oxytocin facilitates human sociability, including trust, attachment and intimacy, and oxytocin promotes orgasm in both genders. Finally, oxytocin may influence mood and ameliorate feelings of depression. Supplemental oxytocin has been found to be helpful in patients with autism spectrum disorder, PTSD, fibromyalgia and other disorders. For more information on clinical uses of Oxytocin, see page 14.

Stand-alone Oxytocin	4006
Add-on Oxytocin to any other 24-hour urine hormone profile	4007

Melatonin 4091/4092

As with growth hormone, 24-hour urine tests excel at measuring melatonin due to its night-time release. Melatonin promotes healthy sleep patterns and is a potent antioxidant. Low levels have been associated with sleep disorders and many chronic diseases such as cancer, coronary artery disease, and obesity. This test includes the important melatonin metabolite, 6-Sulfatoxymelatonin (MT6s). MT6s is a widely accepted means of measuring whole body melatonin status that includes extra-pineal sources such as the gastrointestinal tract.

Stand-alone Melatonin	4091
Add-on Melatonin to any other 24-hour urine hormone profile	4092

Thyroid (Free T3/Free T4) 4456/4457

Urinary free T3 and free T4 provide a sensitive gauge of thyroid hormone status. Thyroid hormone secretion varies throughout the day. As such, a 24-hour urine collection provides a more complete picture of T4 and T3 status.

Note: 24-hour urinary thyroid hormone testing is not a full substitute for serum thyroid hormone evaluation. Serum allows testing of reverse T3 and thyroid autoantibodies which are important for a complete diagnostic picture. See page 21 for serum thyroid panels.

Stand-alone Free T3/Free T4	4456
Add-on Free T3/Free T4 to any other 24-hour urine hormone profile	4457

Urine Nitrates 4460/4461

Included only in male panels. Urine nitrates relate to nitric oxide pathway activity in the body. As a chief vasodilator, nitric oxide status impacts cardiovascular health. Nitric oxide levels also influence erectile function by supporting healthy perfusion. While not a hormone, this analyte is included in male urine hormone panels because of its importance to male sexual function.

Stand-alone Urine Nitrates	4460
Add-on Urine Nitrates to any other 24-hour urine hormone profile	4461

Specimen Type: 24-hour Urine **Turnaround time:** 10-14 business days

Collection Notes **Methodology:**
 GC-MS
 LC-MS/MS
 ELISA

- For patients presently on hormone replacement therapy (HRT), it is usually preferred that they remain on hormones as usual during collection. This allows for more accurate dosage evaluation.
- If baseline levels are desired, it is necessary discontinue hormone replacement for two to three weeks prior to collection.
- Hormone-based contraceptives will suppress endogenous production of estrogens and progesterone.* For an accurate assessment of endogenous production of estrogens and progesterone, patients should discontinue hormone-based contraceptives for at least one month and up to three months prior to collection. Adrenal and thyroid hormones may also be affected by contraceptives containing oral estrogens.
- If postmenopausal and using estrogen and progesterone, collect urine at any time after being on both estrogen and progesterone for at least 5 days. Postmenopausal women not taking hormones can collect at any time.
- Premenopausal women should collect on either days 19, 20 or 21 of a 28 day cycle. Collection days for women having shorter or longer cycles should be adjusted accordingly. For women having irregular cycles call Meridian Valley Lab and speak with a Consulting Physician.

For more information about collection, please see kit instructions. Collection instructions are included in the 24-hour urine hormone kit and are available online at MeridianValleyLab.com

DRIED URINE HORMONE PROFILES

Meridian Valley Lab's newest testing method combines the benefits of a 24-hour urine test with the time-specific advantages previously only available in saliva testing. Our dried urine hormone profile incorporates a wide range of steroid hormone metabolites, measurable only in urine, with 4-point cortisol and cortisone into a single, elegant test.

CompletePLUS 4990

The CompletePLUS is our most popular dried urine profile. It provides a broad and in-depth evaluation of hormone balance, function and circadian cortisol pattern. This panel measures estrogens and clinically relevant estrogen metabolites, which allow for assessment of cancer risk factors and detoxification pathways. Pregnanediol assays progesterone activity in the body. DHEA, testosterone and their metabolites provide a detailed assessment of androgen function. Cortisol, cortisone, and their metabolites, combined with 4-point cortisol and cortisone curves, provide an industry-leading evaluation of adrenal health.

Sample Report: facing page

Complete Profile 4992

The Complete profile is identical to the CompletePLUS, above, with respect to primary hormones and metabolites measured. The Complete profile does not include 4-point Cortisol and Cortisone measurement and graphing, but does include all other adrenal hormones and metabolites.

Adrenal Profile 4994

The Adrenal Profile provides a focused evaluation of adrenal health, reporting DHEA, cortisol, cortisone and clinically important glucocorticoid and mineralocorticoid metabolites. It is most useful as a follow-up assessment when only adrenal function requires monitoring. This panel includes 4-point cortisol and cortisone measurement and graphing.

Sex Hormones Profile 4996

Our basic urinary sex hormone profile measures estrogens (with metabolites), pregnanediol (progesterone marker), DHEA and testosterone.

Estrogen Profile 4998

The Estrogen Profile provides a targeted evaluation of estrogens and estrogen metabolites, which allow assessment of cancer risk factors and detoxification pathways. These are the same metabolites as those reported in the higher-level CompletePLUS, Complete, and Sex Hormones Profiles.

Cortisol x 4 4320

Samples collected at four critical time points in one day provide a useful picture of adrenal function to help patients dealing with stress-related symptoms and disorders. Altered cortisol secretion patterns have been observed in connection with abnormal ACTH levels, clinical depression, psychological stress, and physiological stressors. Recognition of abnormal cortisol release patterns can inform treatment decisions. This test is included in the CompletePLUS and the Adrenal Dried Urine Profiles.

Collection Overview

- Fill out all information on the cards. Collect urine into cup. Make sure information is filled out prior to starting.
- Dip the card, submerge once or twice, to just above the top marker line. Discard urine after each collection.
- After removing the card from the urine cup, tape it so that it hangs freely to dry for at least 24 hours.
- Repeat for each urine collection according to the collection timing guidelines.

Meridian Valley LAB

6839 Fort Dent Way, Suite 206
Tukwila, WA 98188
Tel 206.209.4200 • 855.405.TEST (8378)
Fax 206.209.4211

CompletePLUS (dried urine)

Doctor Name and Address: [Redacted]

SAMPLE REPORT

Analyte	Value	Reference Range
Creatinine	71 mg/dL	35 - 270
Estrogens		
Estrone (E1)	13.4	Luteal Phase: 2.6 - 35.7 Post Menopausal: 0.8 - 5.6
Estradiol (E2)	7.0	1.1 - 9.8
Estriol (E3)	20.0	1.76 - 25.9
Total Estrogens (E1+E2+E3)	40.4	8.6 - 71.4
Estrogen Quotient (E3/(E1+E2))	1.0	0.5 - 2
2-hydroxyestrone (2OHE1)	16.1	3 - 30.5
16α-hydroxyestrone (16αOHE1)	3.6	1.7 - 6.3
2 / 16α Ratio	4.4	2 - 6
4-hydroxyestrone (4OHE1)	1.89	0.41 - 2.5
2-methoxyestrone (2MeOE1)	3.5	0.67 - 7.5
Methylation Ratio (2MeOE1/2OHE1)	0.22 Low	0.25 - 0.75
2-methoxyestradiol	0.29	0.1 - 1.5
Progesterone		
Pregnanediol	90 Low	1208 - 6120 167 - 537

Meridian Valley LAB

6839 Fort Dent Way, Suite 206
Tukwila, WA 98188
Tel 206.209.4200 • 855.405.TEST (8378)
Fax 206.209.4211

CompletePLUS (dried urine)

Patient Name: Doe, Jane
Accession #: 5001 Test ID 660890 Test Code: 4990

SAMPLE REPORT

Androgens	Value	Reference Range
DHEA	40 Low	100 - 1333
Androsterone (Andro)	703	400 - 2560
Etiocholanolone (Etio)	768	400 - 3333
Andro/Etio (5α-reductase)	0.9	0.6 - 1.9
Testosterone	1.9 Low	3 - 20
DHT	< 0.3	0.3 - 3
5α-Androstanediol	15.0	2 - 53
5β-Androstanediol	16.6	3 - 80
Glucocorticoids		
Pregnanetriol	226	80 - 1200
Cortisone (E)	89	21 - 139
Cortisol (F)	35	20 - 113
Cortisol/Cortisone (11β-HSD II)	0.4 Low	0.5 - 0.9
Tetrahydrocortisone (THE)	1382	525 - 2959
allo-Tetrahydrocortisol (5α-THF)	376	142 - 1011
Tetrahydrocortisol (THF)	685	350 - 1887
Adrenal Reserve (THE+5α-THF+THF)	2443	1000 - 4000
5α-THF/THF (5α-reductase)	0.5 Low	0.6 - 1.3
11β-Hydroxyandrosterone	320	124 - 653
11β-Hydroxyetiocholanolone	157	18 - 586
Mineralocorticoids		
allo-Tetrahydrocorticosterone (5α-THB)	57	29 - 251
Tetrahydrocorticosterone (THB)	46	29 - 138
11-Dehydrotetrahydrocorticosterone (THA)	52	25 - 150
Melatonin		
6-Sulfatoxymelatonin (1st Morning)	64.3	17.7 - 84.4

The Importance of Hydration and Creatinine

The four-point cortisol and cortisone values on our dried urine hormone tests are "normalized" to the creatinine level at the time of collection. Cortisol and cortisone levels are inversely related to creatinine — the higher the creatinine level, the lower the cortisol and cortisone values and vice versa. Thus, minimizing influences on creatinine is important to ensure the most accurate results possible. Hydration is the most important of these influences. Fluid intake volume and pattern can greatly affect creatinine concentration in urine. We ask that the patient avoid consuming large volumes of fluid all at one time. Instead, they should sip throughout the day to have an even hydration pattern throughout the testing period. Steady hydration should result in a relatively flat creatinine curve, which is ideal for interpretation purposes. Total fluid intake during the collection period should not exceed 3 liters. Patients are also asked not to take creatine supplements for 24 hours prior to collection. Other factors that may affect creatinine levels are meat intake and heavy exercise.

Ideal creatinine curve showing even hydration.

Creatinine curve showing uneven hydration or other interferences.

Meridian Valley LAB

6839 Fort Dent Way, Suite 206
Tukwila, WA 98188
Tel 206.209.4200 • 855.405.TEST (8378)
Fax 206.209.4211

4-Point Cortisol/Cortisone (dried urine)

Doctor Name and Address: [Redacted]

SAMPLE REPORT

Time	Cortisol (ug/g)	Reference Range
1st Morning	4.7	4.4 - 26.9
2nd Morning	47.9	15.5 - 108
Afternoon	3.8	6.2 - 26.7
Night	3.9	1.8 - 17.7

Time	Cortisone (ug/g)	Reference Range
1st Morning	20.5	18.2 - 69.3
2nd Morning	92.6	41 - 177.1
Afternoon	18.2	28.4 - 101.3
Night	22.9	10.3 - 58.8

Time	Creatinine (mg/dL)	Reference Range
1st Morning	159	35 - 270
2nd Morning	171	35 - 270
Afternoon	132	35 - 270
Night	123	35 - 270

..... Upper and lower limits of reference range.

- ESTROGENS
- PROGESTERONE
- ANDROGENS
- GLUCOCORTICOIDS
- MINERALOCORTICOIDS
- SODIUM/POTASSIUM RATIO
- THYROID

	Estrone	Estradiol	Estriol	2-Hydroxyestrone	16α-Hydroxyestrone	4-Hydroxyestrone	2-Methoxyestrone	2-Methoxyestradiol	Pregnanediol (Progesterone Metabolite)	DHEA	Testosterone	5α- Androstenediol	Dihydrotestosterone	5β-Androstosterone	Androsterone	Etiocholanolone	Pregnanetriol	Cortisone	Cortisol	Tetrahydrocortisone	Allo-Tetrahydrocortisol	Tetrahydrocortisol	11-β-Hydroxyandrostosterone	11-β-Hydroxyetiocholanolone	Four-Point Cortisol and Cortisone	Aldosterone	Allo-Tetrahydrocorticosterone	Tetrahydrocorticosterone	11-Dehydro-Tetrahydrocorticosterone	Sodium	Potassium	Sodium/Potassium Ratio	Free T3	Free T4	Human Growth Hormone (hGH)	Oxytocin	Melatonin	6-Sulfatoxymelatonin	Urine Nitrates (Male Panels Only)
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	24-Hour Urine Profiles																				Dried Urine Profiles									
Comprehensive ULTIMATE	•																				•									
ComprehensivePLUS w/Oxytocin	•																				•									
ComprehensivePLUS w/Melatonin	•																				•									
ComprehensivePLUS w/hGH	•																				•									
ComprehensivePLUS	•																				•									
Comprehensive Profile	•																				•									
Sex Hormone Profile	•																				•									
Adrenal Profile	•																				•									
Estrogen Profile	•																				•									
CompletePLUS	•																				•									
Complete Profile	•																				•									
Adrenal Profile	•																				•									
Sex Hormone Profile	•																				•									
Estrogen Profile	•																				•									

Oxytocin: New Therapeutic Approaches

Oxytocin has been called “The Love Hormone” and the “The Hormone of Happiness.” These somewhat one-dimensional monikers oversimplify the many important actions that oxytocin exerts within human physiology. Oxytocin is a peptide hormone made of nine amino acids and is secreted by the posterior pituitary gland in the brain. Oxytocin plays a well-known role in pregnancy-related uterine contractions and lactation. Recent research has brought to light a new understanding of oxytocin actions in many other body systems.

Oxytocin and Pain

Oxytocin plays an intriguing role in pain perception and pain physiology. Oxytocin receptors participate in modulating visceral pain, which perhaps is not a surprise given oxytocin’s involvement in childbirth. One novel application for oxytocin is for the treatment of migraine and acute headache. A recently published double-blind, placebo controlled study showed a strong dose-response effect with intranasal oxytocin and headache pain.¹ (Figure 1)

Oxytocin and Sexual Physiology

Male erectile tissues are one of the main peripheral target areas for oxytocin. Oxytocin joins nitric oxide, dopamine, vasopressin and other signaling molecules such as cyclic guanosine monophosphate (cGMP) to regulate erectile function.² Oxytocin is an emerging agent in the treatment of erectile dysfunction and male anorgasmia, with recent successful case reports published for both conditions.^{3,4} In women, oxytocin levels are higher after orgasm compared to baseline levels.⁵ Oxytocin strengthens attachment, affection and trust between partners, fostering increased intimacy and emotional connection.

Oxytocin and Stress

Oxytocin exerts anxiolytic and stress attenuating effects. There appear to be multiple mechanisms of action including an inhibitory influence on the amygdala, one of the brain’s stress-response centers. Lactating women have reduced plasma ACTH, cortisol and glucose responses in comparison to postpartum non-lactating women.⁶ A 2003 study demonstrated that supplemental oxytocin in the form of a nasal spray decreased the stress response to a psychological stressor.⁷ This study, a double-blind placebo-controlled trial, subjected men to a stressful public speaking event in a controlled setting. Supplemental oxytocin together with social support before the stressful event significantly reduced cortisol and increased calmness.¹ (Figure 2) Several studies have examined oxytocin’s role as a treatment and prevention strategy in Post-Traumatic Stress Disorder. Oxytocin replacement appears to have interesting potential as a therapeutic stress response attenuator.

Who Should be Tested?

Published research suggests that oxytocin may benefit people with the following conditions:

- Autism
- Depression
- Sexual dysfunction, especially erectile dysfunction
- Headache, fibromyalgia and chronic pain syndromes
- Maladaptive stress syndromes
- Cases of extreme social avoidance/ social withdrawal
- Patients seeking weight loss
- Osteopenia
- Low muscle mass

Meridian Valley Lab is proud to be the only clinical laboratory to offer accurate and affordable oxytocin testing at this time. Oxytocin is available as a stand-alone test and as part of the 24-hr Comprehensive ULTIMATE profile.

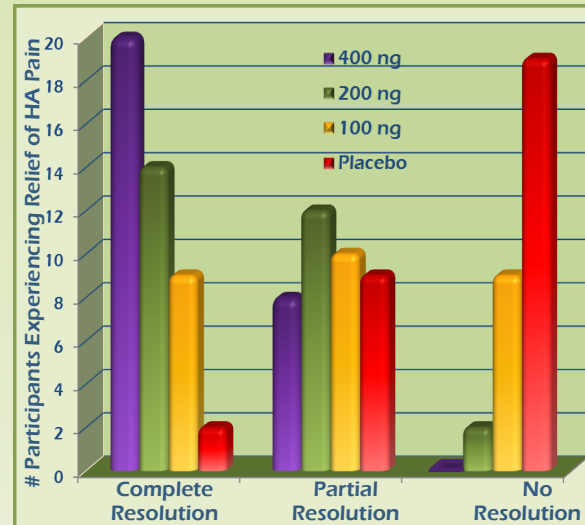


Fig. 1 A clear dose-response is seen in this study of oxytocin used to treat headache pain. Complete resolution of headache pain occurred with 20 out of 28 participants receiving 400ng of intranasal oxytocin, with the remaining eight experiencing partial relief. Those receiving lower doses and placebo had decreased pain relief.

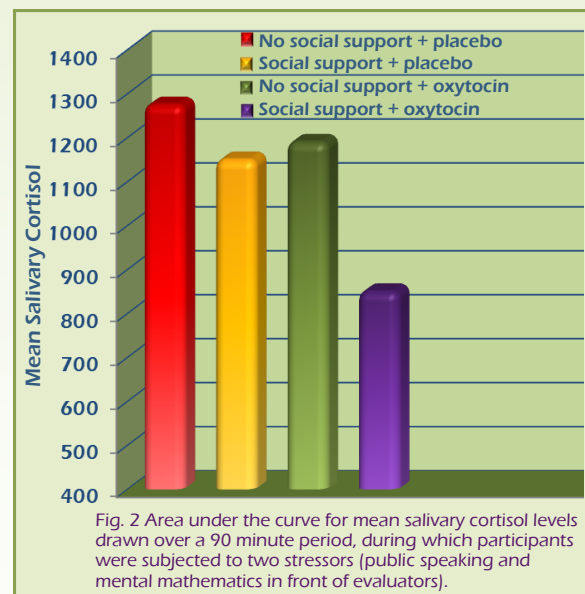


Fig. 2 Area under the curve for mean salivary cortisol levels drawn over a 90 minute period, during which participants were subjected to two stressors (public speaking and mental mathematics in front of evaluators).

SERUM HORMONE PANELS

Testosterone Metabolites Profile

4417

The Testosterone Metabolites Profile measures novel and emerging markers in prostate health. Low endogenous testosterone and its downstream metabolite 5 α -DHT are associated with more aggressive forms of prostate cancer. 3 β -Adiol is a downstream metabolite of 5 α -DHT. 3 β -Adiol mediates against excess prostate cellular proliferation and stimulates healthy apoptosis and redifferentiation. Altogether, the Testosterone Metabolites Panel measures emerging factors that may provide early warning of increased risk for aggressive forms of prostate cancer.

The Testosterone Metabolites Panel includes Androstenedione, Total Testosterone, 5 α -DHT, T/5 α -DHT ratio, 3 β -Adiol, 3 α -Adiol, and 3 β -Adiol/(3 α -Adiol + 5 α -DHT) ratio.

Indications

- Past medical history of prostate cancer
- Family history of prostate cancer
- Current or past use of 5 α -Reductase inhibitors
- Very low 5 α -Reductase activity measured on 24-hour Urine or Dried Urine hormone Profile

Sample Report, page 54

Collection Notes:

Early morning fasting specimen required

Specimen Type:

Red-top collected serum

Turnaround time:

10-14 business days

Methodology:

LC-MS/MS

Male and Female Sex Hormone Profile

4312/4313

This basic panel includes: Estradiol, Estrone, Progesterone, DHEA-Sulfate, Testosterone, and Sex-Hormone Binding Globulin (SHBG). All hormones are measured as total hormone with the exception of Testosterone, which is measured as Free and Total.

Female Sex Hormone Profile

4312

Male Sex Hormone Profile

4313

Individual Serum Hormones

Cortisol

3111

Serum cortisol, particularly an AM fasting measurement, is primarily useful in the evaluation of severe adrenal hypo- or hyperfunction (Addison’s or Cushing’s diseases). Due to the circadian rhythm of cortisol secretion, normal serum values may require additional work-up if pathology is suspected.

DHEA

8010

DHEA is produced by the adrenal cortex, and is the first androgen to rise in puberty. In addition to being an important androgen, it has significant effects on cellular repair. DHEA levels start to decline after 30, and higher levels are associated with longevity. DHEA (non-sulfated) may more accurately reflect the fraction that is bioavailable to the tissues than DHEA-S.

DHEA-Sulfate (DHEA-S)

3112

DHEA-S is a measure of the sulfated form of DHEA and is a more stable, less labile measurement of DHEA status in the serum. DHEA-S may reflect the body’s total DHEA pool. However DHEA-S requires enzymatic removal of the sulfate group to be active and therefore may not reflect actual bioavailability of DHEA.

Free and Total Testosterone

4413

Total testosterone measures the fraction that is bound to sex hormone binding globulin (SHBG), to albumin, and free in the serum. Free testosterone is not bound to SHBG or albumin and as such is available to exert action at the cellular level.

INDIVIDUAL SERUM HORMONES (cont'd.)

Testosterone/Estradiol Ratio

9095

The Testosterone/Estradiol ratio is an important value in men's health, and is chiefly influenced by testicular Leydig cell function and aromatase enzyme activity. Low ratios may have negative consequences on prostate and cardiovascular health, and may relate to poor testosterone production or inappropriately high aromatase activity. High testosterone/estradiol ratios with very low estradiol may adversely affect bone health in men and may reflect aromatase over-inhibition with supplements or pharmaceuticals.

Estradiol (E2)

9046

As the most physiologically active estrogen, estradiol is a useful measurement in both women and men. Estradiol is measured only as total hormone.

Estrone (E1)

9052

Estrone is formed primarily from estradiol and androstenedione and is physiologically weaker in action. Estrone is typically lower in premenopausal women, and higher in postmenopausal and obese women. Estrone is measured only as total hormone.

Progesterone

3118

Progesterone measurements contribute to the workup of PMS, perimenopausal and some menopausal symptoms. Serum progesterone measurements may be useful in evaluating causes of repeated miscarriages.

Follicle Stimulating Hormone (FSH)

3060

FSH is a measure of ovarian function and may be used in evaluating premature ovarian failure and arrival into menopause. FSH is frequently compared to LH in the screening for conditions like PCOS. FSH also regulates spermatogenesis in men.

Luteinizing Hormone (LH)

3070

As with FSH, LH is secreted cyclically and may give insight into a woman's ability to ovulate. In men, LH influences the production of testosterone in the Leydig cells of the testes.

Sex Hormone Binding Globulin (SHBG)

3430

SHBG is a key steroid binding protein in the serum. SHBG preferentially binds androgens like DHT and testosterone, and weakly to estrogens. SHBG rises with age and according to the influence of many other hormones. Hormones bound to SHBG are not available to the tissues. Therefore, SHBG measurements are helpful in comprehensively evaluating hormone balance.

Prostate Specific Antigen (PSA), Free and Total

7127

While not a hormone, serum PSA measurements are often included alongside hormones in men's health evaluations. PSA can be used to track the development of prostatic hyperplasia and neoplasia. Comparisons of free and total PSA yield a "percent free" PSA score, which may provide additional information about prostate cancer risk and development.

Collection Notes:

Early morning fasting specimen required for cortisol; for all others a random specimen is acceptable.

Specimen Type:

Serum

Turnaround time:

7-10 business days

Methodology:

Enzyme labeled chemiluminescent immunometric assay

Free testosterone by RIA
LC-MS method available by request

Estrone via LC-MS

PSA by ICMA

THYROID HORMONE PANELS

Thyroid assessment can be essential to unraveling complicated endocrine cases. Meridian Valley Lab offers a wide array of thyroid panels and individual thyroid hormone tests in serum. For more on thyroid assessment, see 24-hour Urine Free T3 and Free T4, page 13.

Meridian Valley Lab Thyroid Panels

Panel Name/ Test Code	TSH	T3	T4	Free T3	Free T4	Reverse T3	TAB*
Thyroid Evaluation Panel 4258	✓			✓	✓	✓	✓
Thyroid Complete 4259	✓	✓	✓	✓	✓	✓	✓
Basic Thyroid Panel 8020	✓	✓	✓	✓	✓	✓	
Metabolic Thyroid Panel 8021	✓			✓		✓	
Mini Thyroid Panel 8022	✓			✓	✓		

Collection Notes:

Thyroid panels and individual serum thyroid hormone tests require a blood draw and may be fasting or non-fasting. For patients taking thyroid replacement, draw 2-4 hours after taking normal dose. Specimen must be refrigerated.

Specimen Type:

Serum in red top tube only

Turnaround Time:

7-10 business days

Methodology:

Enzyme-labeled chemiluminescent immunometric assay;
Reverse T3 by RIA

* Thyroid Antibodies: Anti-TPO, Anti-TG

Individual Thyroid Hormones

TSH

3050

TSH is the marker most commonly used in conventional medicine to evaluate thyroid activity. However, TSH levels do not always accurately reflect function. Meridian Valley Lab uses a reference range for TSH that takes into account current thinking about optimum TSH levels. TSH values should be considered in the context of FT3, FT4, RT3 values, and clinical symptomatology.

Total T3

3030

Total T3 is an accurate measure of the sum of free T3 and T3 that is bound to thyroid binding globulin.

Total T4

3040

Total T4 is an accurate measure of the sum of free T4 and T4 that is bound to thyroid binding globulin.

Free T3

3015

Free T3 measures only the active hormone that is unbound by thyroid binding globulin and as such may be a more useful measure of thyroid function than total T3.

Free T4

3025

Free T4 measures only the active hormone that is unbound by thyroid binding globulin and as such may be a more useful measure of thyroid function than total T4.

Reverse T3

3031

Reverse T3 is essential to a complete thyroid work-up because of its key role in thyroid hypofunction. RT3 is a thyroid hormone receptor blocker and as such, may increase symptoms of hypothyroidism if elevated.

Thyroid Antibodies (TAB)

1550

Elevated thyroid antibodies can reveal an underlying autoimmune process which may be central to thyroid pathology. This test includes antibodies to thyroid peroxidase (Anti-TPO) and thyroglobulin (Anti-TG).

COMPLETE BLOOD VISCOSITY PROFILE

Cardiovascular disease is not only the number one killer of adults, but is associated with a host of chronic conditions that impact the quality of life. With an aging population, accurate, early detection of risk factors that increase the likelihood of heart attack, stroke, and related conditions is essential. Meridian Valley Lab is pleased to be an innovator in this field, offering the only commercially-available multi-point blood viscosity test. In addition, MVL offers testing for a wide array of cardiovascular risk markers.

Complete Blood Viscosity Profile

7136

Whole Blood Viscosity is an important hemodynamic biomarker which has a strong predictive value for heart attack, stroke, cognitive decline, and complications of diabetes such as retinopathy, ulcerations, and the need for dialysis. It is correlated with all known risk factors for cardiovascular disease and may be more clinically useful than traditional measures in assessing the likelihood of a cardiovascular event.

This profile includes both systolic and diastolic (high shear and low shear) measures of blood viscosity, as well as a Complete Blood Count with platelets and differential. Interpretative guidelines are provided, and free consults with our in-house physicians are available to assist you in making the best use of the results.*

Sample Report, page 55

Indications

- Personal or family history of heart attack, stroke or diabetes
- Presence of risk factors for cardiovascular disease or diabetes, such as smoking, obesity, hypertension, sedentary lifestyle, night shift work, impaired glucose tolerance, elevated lipids, inflammation
- Presence of cardiovascular symptoms such as angina, shortness of breath, poor circulation
- Signs of cognitive decline
- Vision changes
- History of preeclampsia or intra-uterine growth retardation in a previous pregnancy
- Autoimmune disease
- Osteonecrosis
- Osteoarthritis
- Reynaud's Phenomenon
- Hemochromatosis

Collection Notes:

Draw on Monday-Thursday. Ship with provided ice-pack to arrive within 24 hours of draw. **Specimen must be received on a Tuesday-Friday.** Frozen specimens are unacceptable.

Specimen Type:

Whole Blood and Serum

Turnaround time:

5-7 business days

Methodology:

Hemathix multipoint viscometer

* To learn more about blood viscosity, see *The Origins of Atherosclerosis: What Really Initiates the Inflammatory Process*, by Kenneth R. Kensey, MD and Young I. Cho, PhD. 2nd edition. SegMedica, 2007.

Blood Viscosity and Atherosclerosis

Blood is a non-Newtonian fluid with a viscosity that changes with velocity. Blood flowing fast (such as at systole) is less viscous than slower flowing blood (diastole). (Figure 1) Blood viscosity at diastole is anywhere from 2-1/2 to six times higher than blood at systole. Viscous blood is abrasive and damages blood vessel walls, contributing to the initiation of the atherosclerotic process. (Figure 2) Blood viscosity assessments are most useful when both diastolic and systolic viscosity are measured.

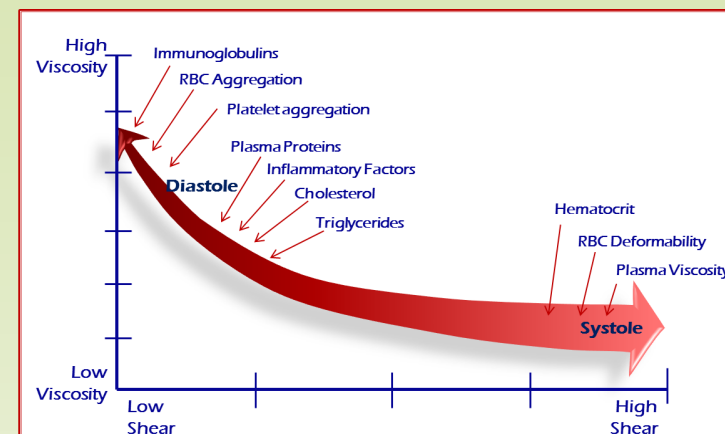


Fig. 1 At systole, blood is flowing faster and is less viscous. At diastole, slower flowing blood is more viscous. Factors associated with cardiovascular disease impact blood viscosity at different points along the curve.

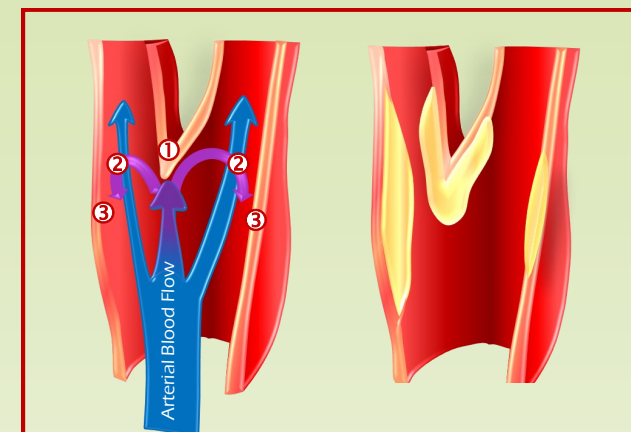


Figure 2. Abrasive, highly viscous blood damages the intima at a bifurcation point 1, where turbulent flow 2 causes further damage to lateral walls 3. This initiates the atherosclerotic process resulting in plaque formation in these locations.

Blood Viscosity Test Results		Reference Range	Units
Systolic	High 47.3	30 - 44	mP
Diastolic	High 159	74 - 126	mP

CBC Test Results		Reference Range	Units
White Blood Cells	4.8	3.8 - 10.8	K/ μ L
Red Blood Cells	5.33	4.2 - 5.8	M/ μ L
Hemoglobin	16.1	13.2 - 17.1	g/dl
Hematocrit	47.3	38.5 - 50	%
MCV	88.7	80 - 100	fL
MCH	30.2	27 - 33	pg
MCHC	34	32 - 36	g/dl
RDW	13.5	11 - 15	%
Platelets	302	140 - 400	K/ μ L
BUN	16	7 - 25	mg/d
Creatinine	1.05	0.7 - 1.25	mg/d

Blood Viscosity Results Interpretation			
Systolic Result	Diastolic Result	Comments/Investigations	Potential Interventions
Severe Hyperviscosity	150	Check LDL, Tg, glucose Check Hct for mild-moderate erythrocytosis	Therapeutic phlebotomy per phlebotomy algorithm Nattokinase supplementation; hydration
Mild to Moderate Hyperviscosity	126	Check LDL, Tg, glucose Check Hct for mild-moderate erythrocytosis	Hydration; nattokinase supplementation Determine if patient is eligible for phlebotomy
Reference Range High	111		Hydration; nattokinase supplementation Determine if patient is eligible for phlebotomy
Optimum Range	89		
Reference Range Low	74		
Hypoviscosity		Check Hct/Hg for anemia Check medications	Dietary changes or medications for anemia correction Dosage changes or stop administering medication(s)

Blood Viscosity Results

Blood viscosity is expressed as two values: Systolic and Diastolic. This allows detection of abnormal diastolic viscosity which may be missed in single-point viscosity measurements.

Complete Blood Count, BUN, Creatinine

Included in the Complete Blood Viscosity Profile to provide additional information for interpretation and treatment recommendations.

Interpretation Section

Provides basic interpretation of blood viscosity results with guide to treatment options dependent on severity of viscosity problem. For more in-depth interpretation, call Meridian Valley Lab for a free consult with one of our Consulting Physicians.

Cardiovascular Profile, Fasting

3114

The fasting Cardiovascular Profile measures a broad range of lipids, nutritional and metabolic markers for comprehensive risk assessment of cardiovascular disease (CVD). This profile provides multiple avenues for intervention by assessing inflammatory, oxidative stress, nutritional and hormonal risk factors not measured in conventional lipid panels. Many of these risk factors for cardiovascular disease can be reduced or eliminated with targeted nutritional, botanical and lifestyle therapies.

Cardiovascular Profile			
Lipoprotein Factors/Ratios	Inflammatory Markers	Oxidant Stress Factors	Other Indicators
Cholesterol, Total	C-reactive Protein (hs-CRP)	Coenzyme Q10 (CoQ10)	RBC Magnesium
HDL (direct)	Ferritin	Lipid Peroxides	Insulin
LDL (direct)	Fibrinogen	Vitamin E α- and γ-tocopherol	Testosterone, total
Triglycerides	Homocysteine		Sex Hormone Binding Globulin (SHBG)
Lipoprotein (a)			Free Androgen Index
LDL/HDL ratio			
Total Cholesterol/HDL ratio			

Collection Notes:
Patient should be fasting for 12 hours prior to draw. Patient may drink water only. It is not necessary to discontinue nutritional supplements prior to this test. Ship specimen with provided ice pack within 24 hours of draw.

Specimen Type:
Serum, Plasma, and Whole Blood

Turnaround time:
10-14 business days

Methodology:
Spectrophotometry, HPLC, ICP/MS, Chemiluminescence

For additional information about these markers, see facing page.

Indications for Cardiovascular Panels

- Family history or risk factors for CVD despite normal cholesterol values
- Personal history of cardiovascular disease
- Angina
- Shortness of breath
- Hypertension
- Insulin resistance or diabetes
- Decreased cognitive function
- Personal history of smoking
- Obesity
- Elevated whole blood viscosity

These risk markers are included in the fasting Cardiovascular Profile. Except where noted(*), individual risk markers are also available as stand-alone tests under the following MVL test codes.

C-reactive Protein, High Sensitivity (hs-CRP) 7134

A general marker of inflammation, studies show that higher hs-CRP levels lead to higher risk of a first heart attack. The risk in people in the upper third of hs-CRP levels is twice that of those in the lower third.

Coenzyme Q10 (CoQ10) 9010

Critical to mitochondrial ATP generation and known to be highly concentrated in heart muscle. Studies support the use of CoQ10 in congestive heart failure.

Ferritin 8090

Elevated ferritin is an important marker of cardiovascular health. High levels are found in ischemic heart disease, iron overload, and hemochromatosis.

Fibrinogen 1650

In states of tissue injury/inflammation, elevated fibrinogen is correlated with early CVD, and is a better marker of risk for a coronary event than elevated cholesterol.

Homocysteine 3012

Homocysteine is a metabolic by-product of methionine metabolism. Elevated levels indicate higher risk of heart disease, stroke, and peripheral vascular disease and may reflect an increased need for selected B-vitamins.

Insulin 8050

Insulin insensitivity is recognized as a major contributing factor to the development and progression of CVD. While fasting insulin can be a useful screening test, a normal value does not exclude the presence of insulin resistance.

Lipoprotein (a) [Lp(a)]* 3114

Lp(a) is an inherited abnormal protein attached to LDL. Lp(a) increases coagulation and triples CVD risk. It is generally not modifiable with diet and exercise but may be lowered with substances such as niacin, estrogen, and nattokinase.

Lipid Peroxides* 3114

Serum lipid peroxides provide assessment of oxidative stress in the body.

RBC Magnesium 1060

Magnesium (Mg) plays many vital roles in preventing CVD, controlling blood pressure, and improving HDL levels. RBC magnesium is an improved method of assessing intracellular Mg status, and is inversely related with hypertension.

Sex Hormone Binding Globulin (SHBG) 3430

SHBG is a key steroid binding protein in the serum. SHBG preferentially binds androgens like DHT and testosterone, and weakly to estrogens. SHBG rises with age and is influenced by many other hormones. Hormones bound to SHBG are not available to the tissues. Therefore, SHBG measurements are helpful in comprehensively evaluating hormone balance.

Testosterone, Free and Total 4413

Normalization of testosterone levels improves cardiac function and many known CVD risk factors. Elevated testosterone may contribute to cardiovascular risk.

Free Androgen Index* 3114

Calculation of the free androgen index from total testosterone and SHBG gives an accurate approximation of free testosterone. The free androgen index is increasingly recognized as an important factor linked with almost every major aspect of heart disease in both men and women.

Vitamin E* 3114

Vitamin E is well recognized for its cardioprotective antioxidant role. It is thought to help prevent the oxidation of LDL.

**Available only as a part of 3114, Cardiovascular Panel.*

THE KRAFT PREDIABETES PROFILE

Maintaining glucose control and insulin sensitivity is essential to good health. Meridian Valley Lab is proud to offer one of the most sensitive assessments of insulin response and glucose control, the Kraft Prediabetes Profile. This test allows for much earlier detection of developing insulin resistance than traditional tests. MVL also offers a complete array of conventional tests for monitoring glucose/insulin status.

The Kraft Prediabetes Profile, 4 hours

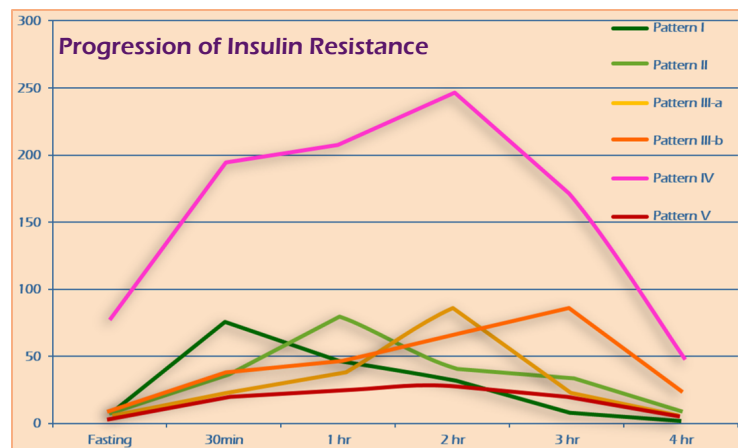
8075/8069/8030

Kraft Prediabetes Profile, 4 hours (Serum) 8075
 Kraft Prediabetes Profile, 4 hours (Bloodspot) 8069
 Kraft Prediabetes Profile, Insulin only, 4 hours 8030

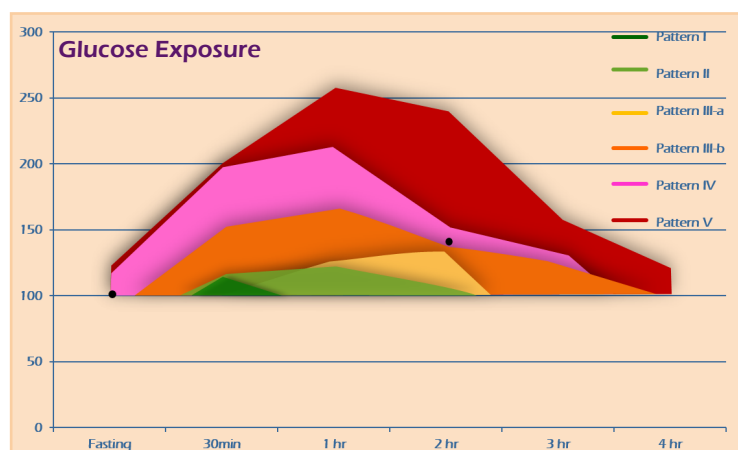
The Kraft Prediabetes Profile is a timed test that measures the patient's insulin response to a measured glucose challenge and return to baseline over a 4-hour period. Based on research published by Dr. Joseph Kraft, this test allows for earlier detection of developing insulin resistance. This test looks at patterns of insulin response rather than a strict cut-off point for glucose. By observing the insulin response pattern, insulin resistance can be identified early in its development. This holds true even when fasting and 2 hour post-challenge glucose levels are normal and fasting insulin is optimal. This test also allows evaluation of the extent of Insulin resistance and can be used to monitor efficacy of treatment. The test is available as a traditional venipuncture test and is now available as a finger-stick bloodspot test.

See Collection Notes, top of page 28.

Sample Report, page 56



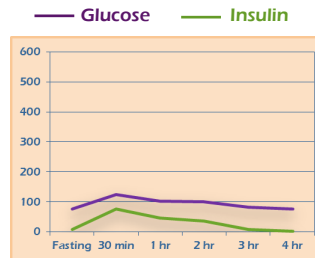
Insulin peaks early in a healthy insulin response, (Pattern I). Insulin resistance is characterized by a delayed insulin peak, (Patterns II through III-b) which occurs later and later as insulin resistance progresses. With Pattern IV (pink), insulin starts high and rises dramatically as the body struggles to keep blood sugar normal. In Pattern V (red), the pancreas produces little insulin in response to a glucose challenge, suggesting islet cell exhaustion.



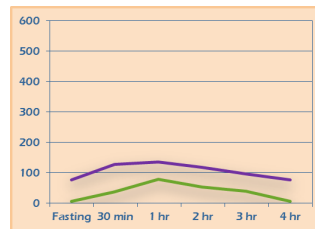
As a consequence of a delayed insulin response, the patient experiences higher levels of blood glucose for longer periods of time. The Area under the curve (AUC) for Pattern II, in this example, is roughly 400% that of Pattern I. Further progression of insulin resistance results in ever-greater exposure to blood glucose levels >100.

The black dots represent Fasting Glucose of 100 and 2-Hour Glucose of 140, the threshold points for impaired glucose tolerance on a standard OGTT. Most of the reports in this example would fall below those thresholds.

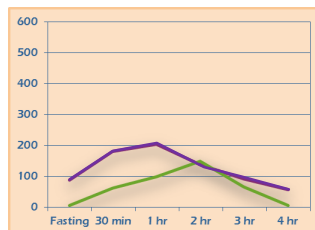
Insulin Response Patterns



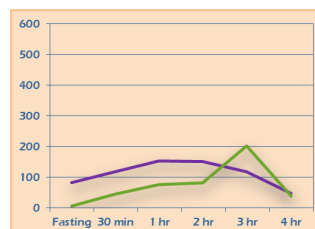
Pattern I: 37 year-old female with normal glucose and insulin response.



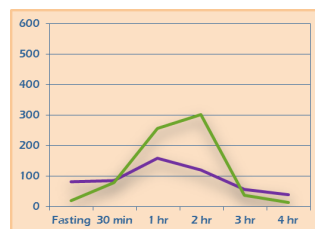
Pattern II: 19 year-old female with fasting glucose, insulin and 2hr glucose all normal. Delayed insulin peak signals borderline Insulin Resistance (IR).



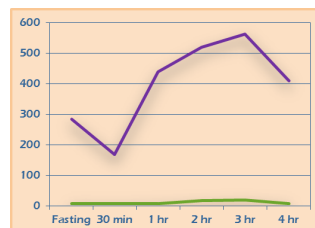
Pattern III-a: 70 year-old female with normal OGTT values. 2hr. Insulin peak indicates well-established IR.



Pattern III-b: 76 year-old female has normal OGTT values. Insulin peak at hour 3 reveals significant IR.



Pattern IV: 67 year old female patient. A massive outpouring of insulin keeps glucose levels normal.



Pattern V: 63 year old male with diabetes. Flattened insulin response suggests islet cell exhaustion.

The Research Behind the Kraft Prediabetes Profile

Dr. Joseph Kraft, a clinical pathologist at St. Joseph's Hospital in Chicago, measured serial insulin levels in 3,650 patients referred for an oral glucose tolerance test (OGTT) to evaluate for diabetes mellitus (DM). 1,937 patients (53%) were diagnosed with diabetes on the basis of the OGTT alone. 1,713 patients (47%) were determined not to be diabetic on the basis of the OGTT.

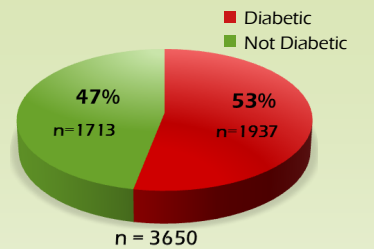


Fig. 1 The oral glucose tolerance test (OGTT) diagnosed 53% of patients with diabetes and 47% as normal.

Serial insulin patterns for these patients revealed problems not uncovered by the OGTT alone. Looking only at glucose, 53% were diabetic and 47% normal. (Figure 1) With the addition of the insulin response curves, the normal tests dropped to 15%. (Figure 2) Overall, the standard OGTT test overlooked 32% of patients (1145 people) who were at risk for diabetes and might have been helped with early interventions. These results were published in 1975¹ and have been confirmed by Dr. Kraft in continuing study of tens of thousands of tests since then.

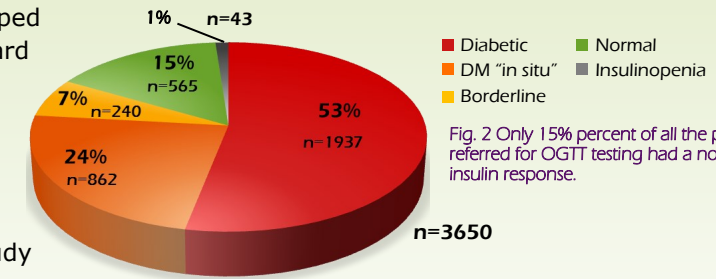


Fig. 2 Only 15% percent of all the patients referred for OGTT testing had a normal insulin response.

Insulin Resistance in Children and Adolescents

In 1990, Dr. Kraft published the results of glucose/insulin assays for 14,384 patients.² These results closely mirrored those of the earlier study, with 16% of patients having normal insulin response patterns, 1% having an insulinopenic response, and 83% having the abnormal insulin curves seen in Patterns II-IV. One particularly notable result related to the 768 patients between the ages of 3-20 included in the study. (Figure 3a-b) Serial insulin testing revealed 76% of these young people had an abnormal insulin response. The prevalence of this dysfunctionality in such a young population is startling. Interestingly, 85% of these young people had fasting glucose of <100 and would not have been tested if American Diabetes Association guidelines had been followed, as the OGTT is recommended only when fasting glucose levels are >100.³

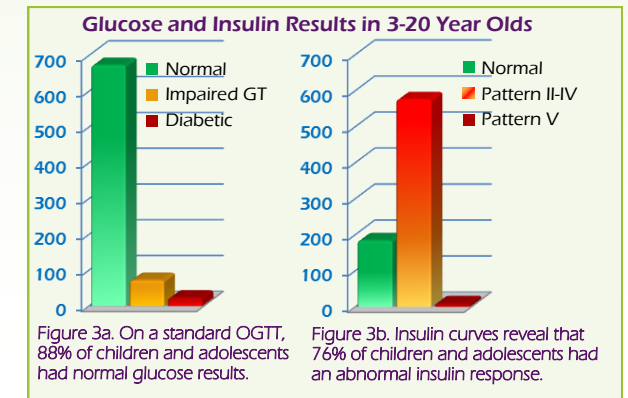


Figure 3a. On a standard OGTT, 88% of children and adolescents had normal glucose results.

Figure 3b. Insulin curves reveal that 76% of children and adolescents had an abnormal insulin response.

- 1 Kraft JR. Detection of diabetes mellitus in situ (occult diabetes). *Lab Med.* 1975. 6(2):10-22.
- 2 Kraft JR. Insulin assay diabetic state identification: a review of 14,000+ glucose/insulin tolerance examinations. *The Proceedings of the Institute of Medicine of Chicago.* April/June 1990. 43(2):34.
- 3 Kraft JR. *The Diabetes Epidemic and You.* Trafford Publishing. 2008. ISBN:978-1-4251-6809-4.

Indications

- Elevated triglycerides and/or elevated blood pressure
- Central obesity or gynecomastia
- High 5 α -reductase activity on a 24-hour urine hormone profile
- Over-aromatization of testosterone to estrogen in men
- PCOS
- Intestinal permeability ("leaky gut"). See page 30 for more information.
- Family history of diabetes or insulin resistance
- Family or personal history of atherosclerosis or cardiovascular disease
- History of gestational diabetes
- Osteoarthritis (may be associated with insulin resistance)

Collection Notes for the Kraft Prediabetes Profiles:
(see page 26 for test descriptions)

8075, 8069, 8030:

Patient should be fasting 8-12 hours before start of test. Water is acceptable. Obtain specimens at fasting and at 30 minutes, 1 hour, 2 hours, 3 hours, and 4 hours post-challenge of 100 gram glucose drink. Ship specimens with ice pack to arrive within 24 hours of draw. Frozen specimens are acceptable but must be labeled as such. Hemolyzed specimens are unacceptable. For bloodspot collections, please follow kit instructions carefully.

Specimen Type:

Serum or bloodspot

Turnaround time:

7-10 business days

Methodology:

Immunoassay

Glycemic Stress Index Profile, fasting

4140

This panel includes Glucose, Insulin, IGF-1, and Hemoglobin A1C, and C-Peptide for a multi-faceted look at glycemic control. See next page for descriptions of individual components.

Indications

- Evaluating the need for exogenous insulin
- Distinguishing Type I from Type II diabetes mellitus

Collection Notes

Patient should be fasting for 8-12 hours prior to draw. Ship specimen with provided ice pack within 24 hours. Hemolyzed specimens are unacceptable.

Specimen Type:

Serum & Whole Blood

Turnaround time:

7-10 business days

Methodology:

Glucose: Enzymatic
Insulin: Immunoassay
HgbA1C: Roche Tina Quant.
IGF-1: ICMA
C-peptide: ECLIA

Glucose

4120

Serum glucose, fasting or non-fasting. Included in

- Kraft Prediabetes Profiles, 4-hour (8075, 8069, 8030)
- Glycemic Stress Index Profile (4140)

Indications

- Routine screening

Insulin, fasting

8050

Serum insulin, fasting. Included in the following tests:

- Glycemic Stress Index Profile (4140)
- Kraft Prediabetes Profiles, 4-hour (8075, 8069, 8030)

Indications

- Routine screening

IGF-1, fasting

3125

Increasing evidence suggests that IGF-1 may have a role in both glucose homeostasis and cardiovascular disease. There is a close association between plasma IGF-1 concentrations and insulin resistance that is independent of other modulators of insulin sensitivity. A low plasma IGF-1 concentration is also significantly associated with metabolic syndrome according to the World Health Organization definition. This suggests that IGF-1 levels may be a useful marker for identifying patients with insulin resistance and at risk for cardiovascular disease.

Included in the Glycemic Stress Index Profile (4140)

Indications

- Personal or family history of cardiovascular disease
- Personal or family history of diabetes
- Suspected growth hormone deficiency
- Elevated triglycerides
- Elevated blood pressure
- Central obesity or gynecomastia
- Other indicators of insulin resistance

HgbA1C

3280

Hemoglobin A1C, also known as glycosylated hemoglobin or glycated hemoglobin, is a reliable measure for estimating serum blood glucose levels over the previous 3-4 months.

Included in the Glycemic Stress Index Profile (4140)

Indications

- Monitoring blood glucose control in patients with diabetes and insulin resistance
- Screening for incipient glucose regulation problems

C-Peptide

4224

C-peptide is a short chain of amino acids that splits off from proinsulin to form insulin. It is produced at the same rate as insulin, making it a marker of insulin production. C-peptide is useful for differentiating endogenous insulin from exogenous insulin, and in assessing the productive capacity of the beta cells.

Included in the Glycemic Stress Index Profile (4140)

Indications

- Assessing endogenous vs. exogenous insulin production
- Assessing health of pancreatic beta cells
- Distinguishing Type I from Type II diabetes mellitus
- Monitoring need for exogenous insulin

Collection Notes for 4120, 8050, 3125, 3280, 4224:

Mark all specimens as fasting or non-fasting. For fasting specimens, patient should be fasting for 12 hours prior to draw. Ship specimen with provided ice pack within 24 hours of draw.

Specimen Type:

Glucose, Insulin, IGF-1 and C-Peptide: Serum
HgbA1C: Whole Blood EDTA

Turnaround time:

7-10 business days

Methodology:

Glucose: Enzymatic
Insulin: Immunoassay
HgbA1C: Roche Tina Quant.
IGF-1: ICMA
C-peptide: ECLIA

Intestinal Permeability: At the Intersection of Gut Health and Glycemic Control

Straddling the Glycemic Control and Gastrointestinal sections in this Compendium, a discussion of intestinal permeability may seem oddly placed. Yet compromised intestinal permeability or “leaky gut” is an important lynchpin that connects these seemingly separate topics. Indeed, the presence of leaky gut is a prime determinant of not only gastrointestinal disease but also the development of metabolic syndrome and diabetes. Once considered a “fringe” diagnosis, leaky gut is now a mainstream medical concept.

The Gut Connection

The epithelial lining of the intestinal tract forms a primary barrier between internal bodily systems and the external environment. Tight junctions exist between each epithelial cell, which in-part dynamically regulates the passage of nutrients and other molecules into the body. Imbalances in intestinal microflora, exposure to gluten (in susceptible individuals) and genetic influences are just a few factors that disrupt the health of this barrier. Damaged tight junctions increase exposure to antigens that can trigger immune reactions and provoke inflammation. The resulting inflammatory cytokines mechanistically promote insulin resistance.¹

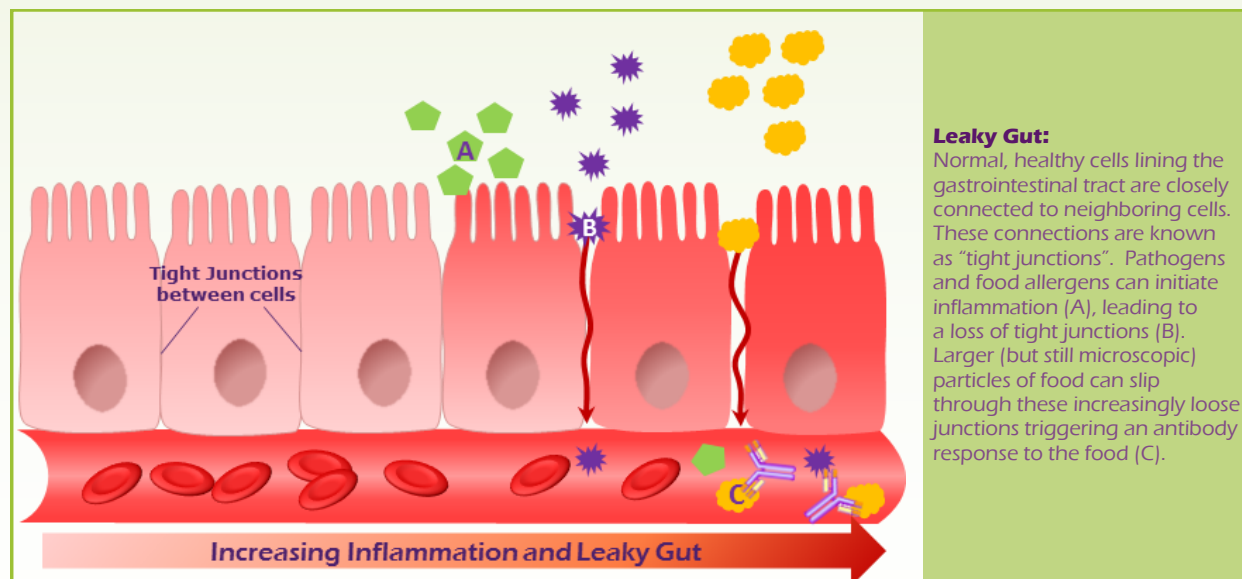
Insights on Gut Health from Diabetes Researchers

Some of the most revealing studies on the impact of leaky gut come from the unexpected source of diabetes journals. Diabetes researchers have found significantly increased markers of intestinal permeability in people who would later develop type 1 diabetes. This finding was evident 3.5 years before a diagnosis could be made, suggesting that compromised gut health may be an early finding on the road to clinical diabetes.² In the development of type 2 diabetes, the exposure to lipopolysaccharide (LPS), a potent “endotoxin” from gram-negative bacteria in the gut, was positively associated with parameters of metabolic syndrome. This “endotoxemia” was also positively associated with incident diabetes, even when adjusted for established risk factors such as glucose, lipids and BMI.³

Clinical Implications

A synthesis of this evidence suggests that patients at risk for either type 1 or type 2 diabetes would benefit from interventions that improve gastrointestinal function. Conversely, patients with gastrointestinal concerns may be candidates for closer glycemic health monitoring. The strong connection between these two physiologic systems underlines the importance of a holistic, functional approach in healthcare.

“Via alterations in the intestinal permeability, intestinal barrier function becomes compromised whereby access of infectious agents and dietary antigens to mucosal immune elements is facilitated, which may eventually lead to immune reactions with damage to pancreatic beta cells and can lead to increased cytokine production with consequent insulin resistance.” S. de Kort, et al. Obesity Reviews, 2011



For the listing of references cited in on this page, please visit www.meridianvalleylab.com/Compendium-References.

A healthy gastrointestinal tract and proper GI function are the basis of good health. Meridian Valley Lab provides a wide array of tests to evaluate intestinal microorganisms, inflammation and digestive function.

Indications for gastrointestinal testing

- Gastrointestinal symptoms such as gas, bloating, constipation, diarrhea
- Food allergies (can contribute to compromised GI health)
- Chronic inflammatory condition or autoimmune disease
- Symptoms of malabsorption, such as fatigue, dry skin, poor quality hair and nails, unexplained low cholesterol or triglycerides
- History of significant or recent antibiotic use
- Travel outside the country

Comprehensive Stool and Digestive Analysis (CSDA) 6000

A comprehensive panel that detects bacteria and yeast in the stool. The CSDA also tests for digestive, inflammatory and immune factors. The CSDA uses an FDA-approved technology known as MALDI-TOF MS (Matrix-Assisted Laser Desorption/Ionization Time of Flight Mass Spectroscopy) to detect bacteria and yeast. This methodology offers an unmatched level of specificity, and is becoming the technology of choice in research centers and hospitals.

Drug resistance and drug sensitivity testing are included when abnormal levels of bacterial and fungi/yeast are found. Also available with parasitology (O&P x3) and fecal heavy metals:

CSDA with Ova and Parasites x 3 6002

Adds microscopy-based parasite, giardia and cryptosporidium detection

CSDA with Fecal Minerals, Toxic 6005

Adds quantification of heavy metals in the stool. Appropriate only for assessing dietary exposure. See p. 40 for test description of “Fecal Minerals, Toxic”.

Complete Stool Digestive Analysis 6000

Intestinal Flora	Digestion/Absorption Factors	Inflammatory Markers	Short Chain Fatty Acids	Intestinal Health Markers
Bacterial culture	Elastase	Lysozyme	Acetate	Red blood cells
Yeast culture	Fecal fat	Calprotectin	Propionate	pH
Microscopic exam (yeast)	Muscle fibers	Lactoferrin	Butyrate	Occult blood
Bacteria/Yeast Sensitivity*	Vegetable fibers	White blood cells	Valerate	Immune Factors
	Carbohydrates	Mucus	Total SCFA quantification	Secretory IgA

Complete Stool Digestive Analysis with O&P x3 6002

Includes parasitology, microscopic exam and protozoa (giardia and cryptosporidium).

Complete Stool Digestive Analysis with Heavy Metals 6005

Includes Antimony, Arsenic, Beryllium, Bismuth, Cadmium, Copper, Lead, Mercury, Nickel, Platinum, Thallium, Tungsten, and Uranium.

Collection Notes:

Patients should complete any course of antifungal and antibiotic medications at least three days before collecting stool. Patients should refrain from taking digestive enzymes, laxatives, antacids, aspirin, barium or bismuth for two days prior to specimen collection. Specimen must reach MVL within 48 hours of the last collection.

Specimen Type:

Stool

Turnaround time:

10-14 business days

Methodology:

Microscopy; culture and sensitivity (if appropriate) for pathogens; ELISA;

*Bacteria and/or Yeast sensitivity included when dysbiotic bacteria or yeast are present.

Microdigestive Panel

6010

The Microdigestive Panel is a basic screening test for gastrointestinal imbalance. Microscopy is used to visually assess various dietary components of stool, including fecal fat (with steatocrit), starch, meat fibers, and vegetable fibers. Also included are white blood cells and occult blood (RBCs). Yeast will be reported if present via microscopy.

Sample Report: page 57

Ova and Parasites x3

7110

This is a conventional microscopy test for parasites and their ova. Single-specimen microscopy for parasites and ova has a low sensitivity as parasites are shed sporadically. Repeating with samples collected at three separate times increases the likelihood of detecting and identifying parasites and ova.

Indications:

- Gastrointestinal symptoms such as gas, bloating, constipation, diarrhea
- History of travel out of the country with concomitant GI symptoms
- History of wilderness camping or hiking with concomitant GI symptoms
- History of family members with parasites
- Dietary malabsorption of macro or micronutrients

Collection Notes:

Patients should complete any course of antifungal and antibiotic medications at least three days before collecting stool. Patients should refrain from taking digestive enzymes, laxatives, antacids, aspirin, barium or bismuth for two days prior to specimen collection. Refrigerate specimen prior to shipping. Specimen must reach MVL within 48 hours of the last collection.

Specimen Type:

Stool

Turnaround time:

10-14 business days

Methodology:

Microscopy

Stool Culture

6060

Screens for bacteria and yeast in the stool. Will report sensitivity information, if applicable.

Candida Culture

6080

Screens for yeast in the stool. Will report sensitivity information, if applicable.

Collection Notes:

Patients should complete antifungal and antibiotic medications at least three days before collecting stool and should not take digestive enzymes, laxatives, antacids, aspirin, barium or bismuth for two days prior to specimen collection.

Refrigerate specimen prior to shipping. Specimen must reach MVL within 48 hours of last collection.

Specimen Type:

Stool

Turnaround time:

10-14 business days

Methodology:

Culture and Sensitivity

H. Pylori Antigen

A qualitative screen for *H. pylori* in the stool.

Indications:

- Peptic ulcer
- Gastro-esophageal reflux

C. Difficile Antigen

6602

Measures the presence of *C. difficile* in the stool.

Indications:

- Gastrointestinal symptoms, especially diarrhea
- History of antibiotic use
- History of prolonged hospitalization

Microbial Organic Acid Test (MOAT)

9025

The Microbial Organic Acid Test measures the organic acids produced by microbes in the gut. This test identifies bacteria and fungal organisms by proxy, via their organic acid by-products. The test reports 20 components such as markers for beneficial bacteria, harmful bacteria, *Clostridia sp.*, *Candida sp.*, yeast and fungal metabolites, and general markers of dysbiosis. The MOAT is a very sensitive assay that can often reveal the presence of microbes that may be missed with traditional microscopy or by culture. This is an especially useful test for the detection of subclinical candidiasis.

Indications:

- Gastrointestinal symptoms such as gas, bloating, constipation, diarrhea
- Concomitant food allergies
- Pre-existing chronic inflammatory condition or autoimmune disease
- Dietary malabsorption of macro or micronutrients

Collection Notes:

Collect first morning urine prior to food or drink. 24 hours prior to collection, avoid the following foods and food products: Apples, grapes, cranberries, pears and raisins. Specimen must be frozen before shipping.

Specimen Type:

Urine

Turnaround time:

10-14 business days

Methodology:

GC-MS

Meridian Valley Lab offers innovative testing for key nutrients that have a profound impact on human health. Attention to select vitamins, minerals, amino acids and fatty acids affords important insight into processes that may underpin a host of chronic symptoms.

Neutrophilic Segmentation

5010

This test determines what percentage of the body's neutrophils were supplied with an optimal amount of folate during development. Optimal is 100% percent. In early stages of development, neutrophilic chromosomes are arranged into five segments. A final step in neutrophil maturation is re-arrangement of those five segments into three. Normal folate metabolism is a key to this final step. With inadequate folate, the chromosome remains in five segments. The neutrophil is then released into the bloodstream as a hyper-segmented neutrophil. *See Indications, below.*

Collection Notes:

It is not necessary to discontinue nutritional supplements prior to this test. Fasting not required. Ship specimen on ice.

Specimen Type:

Whole blood

Turnaround time:

7-10 business days

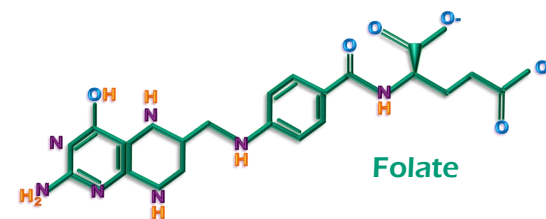
Methodology:

Visual microscopy

Folate

4225

Folate (Vitamin B9) is essential for the synthesis of nucleic acids and red blood cells. It is often low in older individuals and those with neurological disorders. Folate may also be low in those with kidney disease or others with high plasma levels of homocysteine. A number of prescription drugs such as methotrexate may decrease folate levels. Low levels of folate in pregnant women are associated with the appearance of neural tube birth defects in the developing fetus. Low levels are also associated with the appearance of atypical and pre-cancerous cells in the uterine cervix. Folate is commonly ordered together with B12 and a CBC to evaluate a probable anemia. *See collection notes below with Vitamin B12.*



Folate & Vitamin B12

Specimen Type:

Serum

Collection Notes:

Supplements containing folic acid, folate or B12 should not be taken within 4 hours before testing. Patient should be hydrated. Fasting not required. Specimen is stable at room temperature.

Turnaround time:

7-10 business days

Methodology:

IA

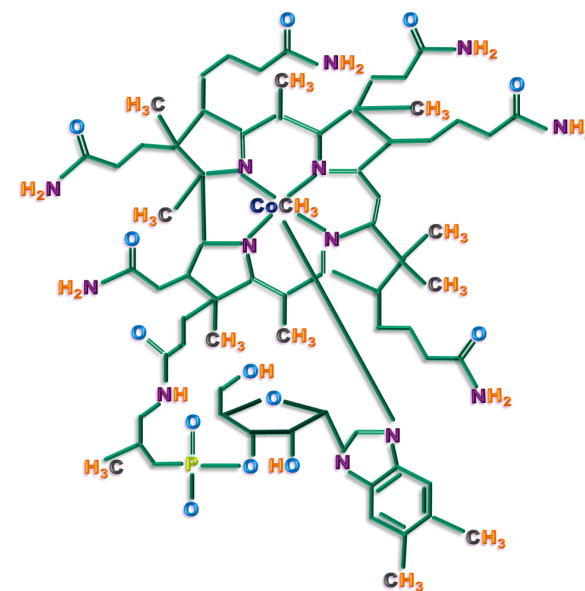
Indications for Neutrophilic Segmentation, Folate and B12 testing

- Fatigue
- Further evaluation of megaloblastic anemia
- Suspected pernicious anemia
- Neuropathy of unknown origin
- Mood and mentation changes especially in older individuals.
- Cardiovascular disease
- Alcoholism
- Inflammatory bowel disease
- Celiac disease
- Suspected Zinc deficiency (neutrophilic segmentation, only)

Vitamin B12

4277

Like folate, vitamin B12 plays a key role in hematopoiesis, homocysteine metabolism and DNA formation. Immune cells and the nervous system are dependent upon B12 for healthy function. B12 is a test commonly ordered together with folate and a CBC to evaluate a probable anemia.



Methylcobalamin (Vitamin B12)

MTHFR Gene Test

7510

MTHFR – Methylene tetrahydrofolate reductase – is an enzyme that converts folate to the active form, N⁵-methyl tetrahydrofolate. This activated form of folate then acts as a cofactor for the enzymatic reaction that transforms homocysteine into methionine. The MTHFR gene is responsible for producing the MTHFR enzyme. MTHFR gene mutations can lead to dysfunctional MTHFR enzymatic function, excessive homocysteine levels and may promote cardiovascular disease risk. MTHFR gene mutations are also responsible for inefficiencies in hepatic detoxification, a problem that can manifest in the form of many chronic diseases. In individuals with genetic thrombophilic factors (e.g., Factor V Leiden), detection of MTHFR mutations signifies a dramatically increased risk for venous thrombosis. This test will determine if there are two, one, or no copies of the C677T and A1298C mutations.

Indications

- Infertility/frequent miscarriages
- Autism
- Depression
- Fibromyalgia
- Birth defects
- Clotting disorders
- Fatigue
- Cardiovascular disease
- Migraines
- Chronic Fatigue Syndrome
- Schizophrenia
- Cerebrovascular disease

Collection Notes:

Store and ship at room temperature immediately. Do not freeze.

Specimen Type:

Whole Blood

Turnaround time:

7-10 business days

Methodology:

Fluorescent Microspheres, Oligonucleotide Ligation Assay, Polymerase Chain Reaction

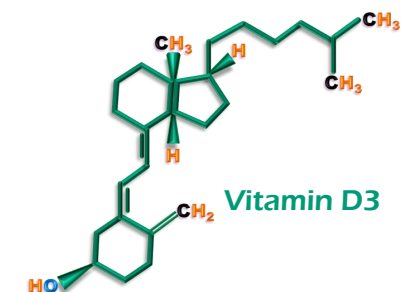
25-OH Vitamin D

1260

Vitamin D regulates bone health, immune function and cellular growth. Low Vitamin D levels have been implicated in a host of chronic conditions, including cardiovascular disease, osteoporosis, autoimmunity and cancer.

Indications

- Sunscreen use
- Aging populations
- Darker skin color
- Breastfeeding
- Obesity
- Cancer
- Cardiovascular disease
- Autism/Asperger's/ADHD
- Diabetes
- Mental health disorders/depression
- Musculoskeletal disorders
- Infections and autoimmunity
- Oral health issues
- Respiratory issues
- Dermatological conditions
- Malabsorption



Collection Notes:

It is not necessary to discontinue nutritional supplements prior to this test, however supplements containing Vitamin D should not be taken within 6 hours before testing. Patient should be hydrated. Fasting not required. Ship within 48 hours of collection.

Specimen Type:

Serum

Turnaround time:

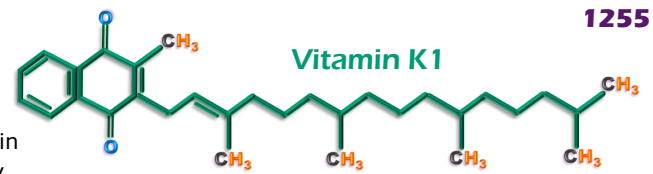
7-10 business days

Methodology:

Immunoassay

Vitamin K1, fasting

Vitamin K1 participates in the formation of coagulation factors II, VII, IX and X. Insufficient Vitamin K1 can lead to delayed blood clotting and easy bruising. Vitamin K1 also contributes to the formation of osteocalcin, an important protein in bone physiology. Vitamin K1 is produced in large part by friendly intestinal bacteria, and is also present in leafy greens and other vegetables.



Indications

- Osteoporosis
- Cardiovascular disease
- Use of pharmaceutical blood thinners
- Restrictive diets
- Long-term antibiotic use

Collection Notes:

Patient should be hydrated and fasting 8-12 hours before collection. It is not necessary to discontinue nutritional supplements prior to this test, other than during the fasting period. Ship within 48 hours of collection.

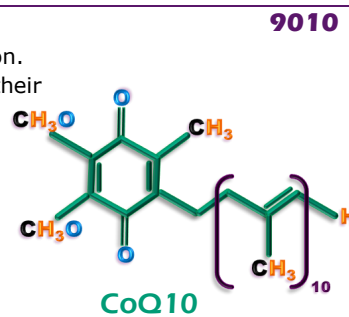
Specimen Type:
Serum

Turnaround time:
7-10 business days

Methodology:
UHPLC

CoQ10

Coenzyme Q10 (CoQ10) resides inside cellular mitochondria and participates in ATP production. In a state of good health, CoQ10 is especially plentiful in cardiac muscle fibers and supports their high energy demand. CoQ10 is notably decreased as a side effect of certain cholesterol lowering drugs.



Indications

- Cardiovascular disease
- Muscular dystrophy
- Parkinson's disease
- Cancer
- Blood sugar dysregulation
- Statin use
- Malabsorption

Collection Notes:

Patient should be hydrated. It is not necessary to discontinue nutritional supplements prior to testing, however, patients should not take their daily dose until after being drawn. *Sample is light sensitive. Transfer to amber-colored transfer tube after centrifuging.* Ship within 48 hours of collection.

Specimen Type:
Serum

Turnaround time:
7-10 business days

Methodology:
HPLC

Homocysteine

Elevated homocysteine is an independent risk factor for cardiovascular disease. When elevated, homocysteine is associated with endothelial dysfunction and atherosclerosis. High levels may reflect an insufficiency of vitamins B12, B6 and folate.

Indications

- Cardiovascular disease
- Malnutrition/malabsorption

Collection Notes:

Patient should be hydrated before collection. It is not necessary to discontinue nutritional supplements prior to testing. Ship within 48 hours of collection.

Specimen Type:
EDTA plasma is preferred;
serum is acceptable

Turnaround time:
7-10 business days

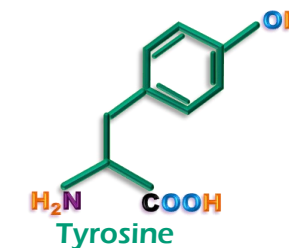
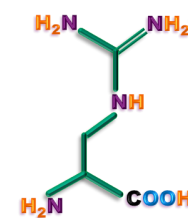
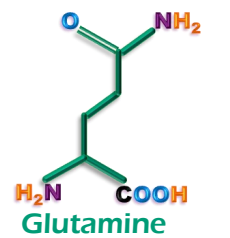
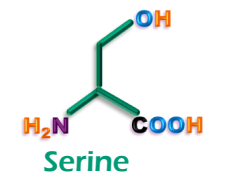
Methodology:
Chemiluminescence

Fasting Amino Acids - Plasma

This panel reports 20 essential, non-essential and branch chain amino acids. In addition, this test provides a recommended amino acid prescription – customized to the patient's results. Amino acids are the building blocks of body proteins and form the precursors for neurotransmitters. Specific amino acid imbalance can relate to vitamin and mineral insufficiencies. Overall, amino acid testing reflects a patient's digestive health and nutrition status.

Indications

- Malabsorption
- Depression
- Anxiety
- Insomnia
- Rheumatoid arthritis
- Cardiovascular disease
- Hair loss
- ADD/ADHD/ASD
- Disorders of detoxification



Collection Notes:

Patient should be hydrated and fasting 8-12 hours before collection. It is not necessary to discontinue nutritional supplements prior to testing other than during the fasting period. Freeze specimen and ship within 48 hours of collection.

Specimen Type:
Plasma

Turnaround time:
10-14 business days

Methodology:
Reversed Phase UHPLC Method

Essential Fatty Acids

Dietary fats in general, and essential fatty acids (EFAs) in particular play a significant role in the body's pro-inflammatory vs. anti-inflammatory balance. Inflammation is a central facet in many chronic diseases, making EFAs an integral element in human health. MVL offers RBC testing for essential fatty acids. The RBC EFA test measures the body's "tissue" storage pool and reflects long-term EFA status.

Indications

- Inflammation
- Statin use
- Cardiovascular concerns
- Mood imbalances and depression
- Monitor treatment



Docosahexaenoic acid (DHA)

Collection Notes:

Patient should be hydrated. Fasting is not required. It is not necessary to discontinue nutritional supplements prior to testing other than during the fasting period. Ship within 48 hours of collection.

Specimen Type:

Whole blood

Turnaround time:

10-14 business days

Methodology:

GC-MS

1221

N-Telopeptide (NTx)

The NTx test measures the degree of bone remodeling or bone turnover. While not a measurement of bone density, the NTx test can be a useful clinical tool to monitor a bone health treatment plan in complement to a DEXA scan. Additionally, the NTx test may be used more frequently than an annual DEXA scan to monitor treatment progress. This test is sometimes run in conjunction with a urine calcium test (see below). Also available as an add-on to a 24-hour urine hormone panel.

NTX - Single collection (2nd morning urine) 3003
 NTX - 24-hour urine collection 7118

Indications

- Osteoporosis/Osteopenia
- Increasing age
- Small stature, small frame
- Menopause
- Amenorrhea in pre-menopausal women
- Low testosterone levels in men
- Chronic use of certain medicines such as corticosteroids and anticonvulsants
- Chronic disease

Collection Notes:

Requires second morning urine specimen, or refrigerated 24-hour collection.

If collecting as part of a 24-hour urine hormone panel, remove boric acid tablet from collection jug prior to collection.

Specimen Type:

Urine

Turnaround time:

7-10 business days

Methodology:

EIA

3003/7118

Calcium - Urine

This test measures the amount of calcium excretion by the kidneys. A urine calcium test is sometimes run in conjunction with the N-Telopeptide (NTx) test (see above).

Indications

- Kidney stones
- Kidney disease
- Monitor parathyroid activity
- Malabsorption/ malnutrition

Collection Notes:

Requires a 24 hour urine collection.

Specimen Type:

Urine

Turnaround time:

7-10 business days

Methodology:

Colorimetric

3004

Urine Minerals

Urine minerals are available as an add-on to any 24-urine hormone panel. Included are sodium, potassium, calcium, magnesium and phosphorus. See page 13 for collection notes and technical information.

Urine Nitrates

Urine nitrates are included in male ComprehensivePlus and Comprehensive ULTIMATE 24-hour urine panels. This test is also available as an add-on to any other male 24-hour urine hormone panel. Urine nitrates reflect nitric oxide pathway activity in the body. As a chief vasodilator, nitric oxide status impacts cardiovascular health. Nitric oxide levels also influence erectile function by supporting healthy perfusion. As such, this analyte is offered in male urine hormone panels because of its importance to male sexual function. See page 13 for collection notes and technical information.

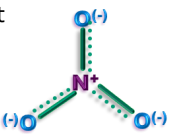
Stand-alone Urine Nitrates

4460

Add-on Urine Nitrates to any other 24-hour urine hormone profile

4461

4460/4461



Nitrate Ion

Iodine Loading Test and Iodine Loading with Halides

The Iodine Loading Test is useful for quantifying suspected iodine deficiency. Iodine deficiency is an important rule-out in functional hypothyroidism, fibrocystic breasts and any clinical scenario that involves estrogen dominance.

Iodine status can also be compromised after prolonged environmental exposure to halide elements (fluoride, bromide). Bromide and fluoride strongly compete with iodide absorption and metabolism. Excessive intake of these halides can accumulate in tissues, displace iodine and compromise the production of thyroid hormones and mammary gland health. Bromide is used in commercial baking, soft drinks, pesticides and some medications. Primary sources of fluoride include fluoridated water, beverages, toothpaste, mouthwashes and some medications.

The Iodine Loading Test measures iodine urinary excretion after a one-time iodine loading dose. The level of iodine excretion in turn relates to the patient's iodine sufficiency (or insufficiency) status. The optional halide measurement adds to the assessment by identifying a potential etiology of iodine deficiency.

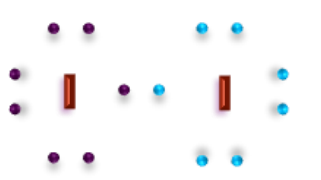
Iodine Loading Test

7610

Iodine Loading with Halides

7611

7610/7611



Iodine Molecule (I₂)

Indications

- Thyroid disorders
- Fatigue
- Fungal infections
- Halide exposure
- Fibrocystic breasts
- Goiter
- Uterine fibroids

Collection Notes:

Avoid iodine supplements and seaweed consumption for 48 hours prior to collection except for supplied 50mg Iodoral® challenge tablet. Female patients should not collect during menses.

Specimen Type:

24-hour urine after iodine challenge

Turnaround time:

10-14 business days

Methodology:

ICP Mass Spectrometry verified with ion selective electrodes

ESSENTIAL AND TOXIC ELEMENTS

Minerals and other essential elements are vital components of a well-tuned and fully functioning organism. Some minerals are co-factors catalyzing multiple enzyme actions in diverse bodily systems. In a world with increasingly depleted soils, adequate mineral intake can be hard to achieve by diet alone. At the same time, increasing pollution has resulted in ever-higher levels of exposure to toxic elements, such as mercury, lead, and cadmium. These toxins can contribute to a wide range of physical and mental symptoms. Meridian Valley Lab is pleased to offer a variety of testing options for evaluating essential and toxic elements.

Indications for Testing:

- Suspected malabsorption
- Poor nutrition
- Neurological problems
- Autoimmune disease
- Chronic or difficult to diagnose conditions
- Heavy metal exposure
- Inflammatory processes
- Anemia
- Blood sugar dysregulation
- Cardiovascular disease

Periodic Table of the Elements

Essential and Toxic Elements - Red Blood Cell

1070

Red blood cells afford a "tissue-level" analysis for the essential and toxic elements. Minerals such as magnesium, zinc, potassium, chromium and vanadium are more accurately assessed in the red blood cell. As such, the red blood cell provides a truer picture of mineral status in some cases. Please see the table at the end of this section for a comparison of testing options and elements.

Collection Notes:

Patient should be hydrated and fasting 8-12 hours before collection. It is not necessary to discontinue nutritional supplements prior to testing, other than during the fasting period. Ship within 48 hours of collection.

Specimen Type:

Unwashed, packed red blood cells; Whole Blood

Turnaround time:

10-14 business days

Methodology:

ICP-MS

Essential and Toxic Elements – Whole Blood

1170

Whole blood provides an excellent medium to assess frank nutrient excesses or deficiencies. Whole blood also represents the conventional method for identifying recent exposure to toxic metals.

Urine Minerals, 6-Hours Pre- or Post-provocation

1123/1127/1128

This test analyzes the levels of essential and/or toxic elements in the urine. The test can be performed before or after the administration of a chelating agent. A pre-provocation test measures the essential and toxic elements in the body under homeostatic conditions. A post-provocation test, using EDTA, DMSA, DMPS, etc. measures the excretion of the retained toxic body burden that has been sequestered in the tissues. The post-provocation test is a preeminent method for detecting past toxic metal exposure.

- Urine Minerals, 6-hours pre- or post-provocation, essential & toxic 1123
- Urine Minerals, 6-hours pre- or post-provocation, essential only 1127
- Urine Minerals, 6-hours pre- or post-provocation, toxic only 1128

Collection Notes:

Urine is collected pre- or 6 hours post administration of an oral or IV chelating agent. *Chelating agent is not included in kit.*

Specimen Type:

6-hour Urine

Turnaround time:

10-14 business days

Methodology:

ICP-MS

Hair Minerals, Essential and Toxic

1030

Hair element analysis is an inexpensive and non-invasive screen for essential mineral excess and deficiency. Hair analysis also screens for toxic element exposure. A hair mineral analysis may be an effective pre-screen for essential mineral and toxic metal status prior to a pre/post provocation urine mineral test. Hair analysis should not be considered a stand-alone diagnostic test for essential mineral status or toxic element load.

Collection Notes:

For best results collect scalp hair at nape of neck at least 6 weeks after any treatment involving dyes, bleach, straightening, or other chemical alteration of the hair.

Specimen Type:

Scalp hair preferred. Pubic hair acceptable.

Turnaround time:

10-14 business days

Methodology:

ICP-MS

Fecal Minerals, Toxic only

1032

This test is a direct measurement of dietary exposure to toxic metals. The test result reflects dietary exposure spanning one to two days prior to specimen collection. *This test does not directly measure the residual toxic metal body burden.* However, the test can be used to infer latent toxicity if the patient has been consuming a very consistent diet. As such, fecal toxic metal testing can be used to determine the severity of current dietary exposure. Additionally, this test can assay the ingestion of mercury from dental amalgams.

Collection Notes:

Patient should consume their usual diet without changes from what is typical for two days prior to collection.

Discontinue the following for three days prior to stool collection: rectal suppositories, enemas, bentonite clay, mineral or castor oil, bismuth-containing medications, and antacids.

Do not have dental amalgams installed or removed for three days prior to stool collection.

Specimen Type:

Feces

Turnaround time:

10-14 business days

Methodology:

ICP-MS

Essential & Toxic Element Panels

Elements Measured	Hair	Urine	Whole Blood	RBC	Fecal
Essential :					
Boron	●	●		●	
Calcium	●	●	●	●	
Chromium	●	●		●	
Cobalt	●	●	●		
Copper	●	●	●	●	●
Germanium	●				
Iodine	●			●	
Iron	●	●		●	
Lithium	●	●	●		
Magnesium	●	●	●	●	
Manganese	●	●	●	●	
Molybdenum	●	●	●	●	
Phosphorus	●	●		●	
Potassium	●	●		●	
Rubidium	●				
Selenium	●	●	●	●	
Sodium	●	●			
Strontium	●	●	●		
Sulfur	●	●			
Vanadium	●	●		●	
Zinc	●	●	●	●	
Zirconium	●				
Toxic:					
Aluminum	●	●			●
Antimony	●	●			●
Arsenic	●	●	●	●	●
Barium	●	●	●		
Beryllium	●	●			●
Bismuth	●	●			●
Cadmium	●	●	●	●	●
Cesium		●			
Gadolinium		●			
Lead	●	●	●	●	●
Mercury	●	●	●	●	●
Nickel	●	●	●		●
Palladium		●			
Platinum	●	●	●		●
Silver	●		●		
Tellurium		●			
Thallium	●	●	●	●	●
Thorium	●	●			
Tin	●	●			
Titanium	●				
Tungsten		●			●
Uranium	●	●	●		●

AGE MANAGEMENT

Prevention is the best medicine, and screening is an important part of prevention. Meridian Valley Lab offers a number of general screening panels as well as screening panels designed for men and women concerned with healthy aging.

Age Management Panels

The Age Management Panels are comprehensive arrays that include serum hormones and inflammatory markers such as homocysteine and high sensitivity C-Reactive protein. This panel is intended for an overall assessment of markers important in managing health in men and women over the age of 35. Available for both fasting and non-fasting specimens, the male and female fasting panels include:

- Albumin
- Homocysteine
- hs-CRP
- DHEA-S
- IGF-1
- IGF Binding Protein 3 (IGFBP-3)
- Estradiol
- Testosterone (free and total)
- Bioavailable testosterone (calculated)
- Sex Hormone Binding Globulin (SHBG)
- Free T3
- Insulin
- Male panels include free and total PSA
- Female panels include progesterone

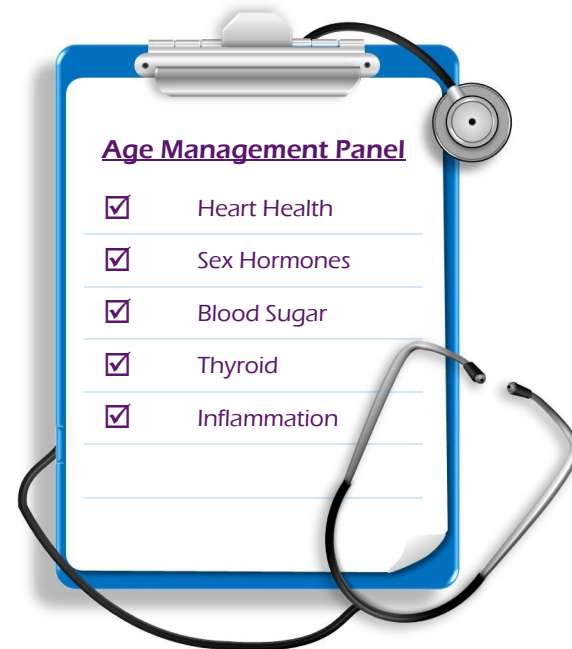
The non-fasting panels includes all of the above except insulin.

Male Age Management Panel, fasting 4306

Male Age Management Panel, non-fasting 4307

Female Age Management Panel, fasting 4304

Female Age Management Panel, non-fasting 4305



Collection Notes:
Age Management Panels can be performed fasting or non-fasting. Fasting panel includes insulin.

Specimen Type:
Serum

Turnaround time:
7-10 business days

Methodology:
Enzyme-labeled chemiluminescent immunometric assay
Total testosterone by dialysis method
Free testosterone by LC/MS/MS

COMBINED HEALTH SCREENING PANELS

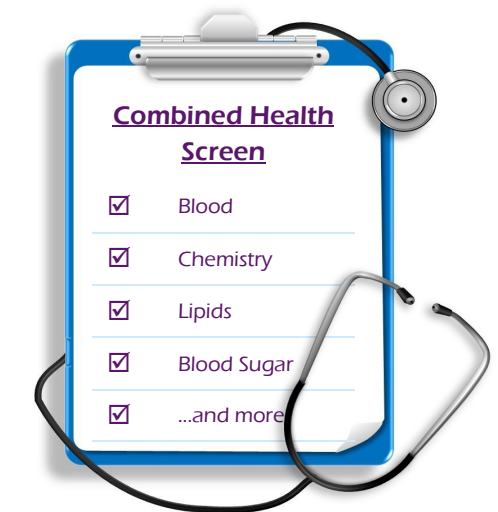
Combined Health Screen (CHS)

The Combined Health Screen panel (formerly known as a SMAC) combines several commonly-ordered screening panels and markers into a single, easy-to-order and cost-effective panel. This panel includes a standard Comprehensive Metabolic Panel (CMP), a Lipid Panel, Complete Blood Count (CBC) with differential and platelets, and additional useful analytes. An extended panel is also available, as well as panels with additional special focus analytes. (See below.)

- Combined Health Screen (CHS)** 3010
- Extended Combined Health Screen (CHS-E)** 7107
- Combined Health Screen with Homocysteine (CHS-H)** 7104
- Combined Health Screen with Ferritin (CHS-F)** 7106
- Combined Health Screen with Mini-Thyroid (CHS-T)** 3009
(Includes TSH, Free T4, Free T3)

Indications

- General screening for a broad range of health, cardiovascular, and nutritional concerns (CHS, CHS-E)
- Suspected methylation disorder or cardiovascular disease (CHS-H)
- Suspected low or high iron status (CHS-F)
- Suspected thyroid dysfunction (CHS-T).



Combined Health Screen Panel – Extended				
Combined Health Screen Panel				Additional Markers in CHS-E
Complete Blood Count	Comprehensive Metabolic Panel	Lipid Panel	Other Included Markers	Additional Markers in CHS-E
WBC RBC Hemoglobin Hematocrit MCV MCH MCHC RDW Platelets WBC Differential % and absolute	Albumin Alkaline Phosphatase ALT (SGPT) AST (SGOT) Total Bilirubin BUN Calcium Creatinine Glucose Total Protein Chloride CO2 Potassium Sodium	Total Cholesterol HDL Cholesterol LDL Cholesterol (Calculated) Total Cholesterol to HDL Ratio Triglycerides	HgbA1C Iron Total Iron Binding Capacity (TIBC) Globulin Albumin/Globulin Ratio (A/G Ratio) GGT LDH Direct Bilirubin Uric Acid Phosphorus Magnesium	High sensitivity C-Reactive Protein (hs-CRP) Vitamin D (25-OH Vit D) Ferritin Fibrinogen Homocysteine

Collection Notes:
Patient should be fasting for 8-12 hours prior to draw. Ship specimen with provided ice pack within 24 hours.

Specimen Type:
Whole Blood & Serum

Turnaround time:
5-10 business days

Methodology:
Colorimetric, Enzymatic, ECLIA, ICMA, Roche Tina Quant.

Patient Name: _____ Age: _____ Date of Birth: _____
 Accession No: _____ External ID: _____
 Doctor/Clinic: _____ Date Collected: _____
 Order Doctor: **SAMPLE REPORT** Date Received: _____
 Fax#: _____ Date Run: _____
 Comments: _____ Doctor ID: _____ Data File: _____
 _____ Technician: _____ Date Reported: _____
 _____ Date Final: _____

Final Report

RESULT	Reference Range			ALLERGEN	Low	Moderate	Avoid
	Low	Moderate	Avoid				
DAIRY							
6	Low	<100	100 - 350	>350	Casein		
12	Low	<100	100 - 350	>350	Cheddar Cheese		
81	Low	<100	100 - 350	>350	Cottage Cheese		
151	Moderate	<100	100 - 350	>350	Cow's Milk		
0	Low	<100	100 - 350	>350	Goat's Milk		
32	Low	<100	100 - 350	>350	Mozzarella Cheese		
434	Moderate	<150	150 - 450	>450	Whey		
MEATS							
1	Low	<100	100 - 250	>250	Beef		
3	Low	<100	100 - 250	>250	Buffalo		
3	Low	<100	100 - 250	>250	Chicken		
1587	Avoid	<150	150 - 450	>450	Egg White		
1466	Avoid	<150	150 - 450	>450	Egg Yolk		
0	Low	<100	100 - 250	>250	Lamb		
0	Low	<100	100 - 250	>250	Pork		
0	Low	<100	100 - 250	>250	Turkey		
GRAINS							
170	Moderate	<100	100 - 250	>250	Barley		
5	Low	<100	100 - 250	>250	Buckwheat		
10	Low	<100	100 - 250	>250	Corn		
35	Low	<100	100 - 250	>250	Glutadin		
46	Low	<100	100 - 250	>250	Gluten		
3	Low	<100	100 - 250	>250	Hemp		
14	Low	<100	100 - 250	>250	Oat		
24	Low	<100	100 - 250	>250	Quinoa		
0	Low	<100	100 - 250	>250	Rice		
19	Low	<100	100 - 250	>250	Teff		
36	Low	<100	100 - 250	>250	Wheat		
FISH							
6	Low	<100	100 - 250	>250	Cod		
0	Low	<100	100 - 250	>250	Halibut		
15	Low	<100	100 - 250	>250	Salmon		
0	Low	<100	100 - 250	>250	Sardine		
3	Low	<100	100 - 250	>250	Sole		
0	Low	<100	100 - 250	>250	Tilapia		
3	Low	<100	100 - 250	>250	Trout		
1	Low	<100	100 - 250	>250	Tuna		
SHELLFISH							
8	Low	<100	100 - 250	>250	Clam		
24	Low	<100	100 - 250	>250	Crab		
0	Low	<100	100 - 250	>250	Lobster		
68	Low	<100	100 - 250	>250	Oyster		
15	Low	<100	100 - 250	>250	Shrimp		
NUTS							
210	Moderate	<100	100 - 250	>250	Almond		
11	Low	<100	100 - 250	>250	Peanut		
0	Low	<100	100 - 250	>250	Pecan		
0	Low	<100	100 - 250	>250	Pumpkin Seed		
7	Low	<100	100 - 250	>250	Sesame Seed		
0	Low	<100	100 - 250	>250	Sunflower Seed		
0	Low	<100	100 - 250	>250	Walnut		

MVL Allergy procedure uses both IgE and IgG4 antibodies for combined testing. | References: Volcheck GW. Postgrad Med. 2001 May; 109(5):71. | * Updated reference ranges and new antigens added
 Due to literature documented test sensitivity limitations, negative serum allergy tests should not be used to justify exposure to an allergen that is clinically suspected as the cause of anaphylactic reaction.

Patient Name: _____ Age: _____ Date of Birth: _____
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 Fax#: _____ Date Run: _____
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 _____ Date Final: _____

Final Report

RESULT	Reference Range			ALLERGEN	Low	Moderate	Avoid
	Low	Moderate	Avoid				
FRUITS							
0	Low	<100	100 - 250	>250	Apple Mix		
0	Low	<100	100 - 250	>250	Apricot		
12	Low	<100	100 - 250	>250	Avocado		
164	Moderate	<100	100 - 250	>250	Banana		
8	Low	<100	100 - 250	>250	Blueberry		
33	Low	<100	100 - 250	>250	Cranberry		
0	Low	<100	100 - 250	>250	Grapefruit		
0	Low	<100	100 - 250	>250	Lemon		
8	Low	<100	100 - 250	>250	Orange		
0	Low	<120	120 - 250	>250	Papaya		
9	Low	<100	100 - 250	>250	Peach		
0	Low	<100	100 - 250	>250	Pear		
231	Moderate	<120	120 - 300	>300	Pineapple		
0	Low	<100	100 - 250	>250	Plum		
0	Low	<100	100 - 250	>250	Raspberry		
0	Low	<100	100 - 250	>250	Red Grape		
28	Low	<100	100 - 250	>250	Strawberry		
0	Low	<100	100 - 250	>250	Watermelon		
VEGETABLES							
74	Low	<100	100 - 250	>250	Asparagus		
0	Low	<100	100 - 250	>250	Beet		
12	Low	<100	100 - 250	>250	Black Olive		
0	Low	<100	100 - 250	>250	Broccoli		
6	Low	<100	100 - 250	>250	Cabbage		
56	Low	<100	100 - 250	>250	Carrot		
3	Low	<100	100 - 250	>250	Cauliflower		
9	Low	<100	100 - 250	>250	Celery		
5	Low	<100	100 - 250	>250	Cucumber		
211	Moderate	<100	100 - 300	>300	Garlic		
385	Avoid	<100	100 - 250	>250	Green Bean		
33	Low	<100	100 - 250	>250	Green Pepper		
866	Avoid	<150	150 - 450	>450	Kidney Bean		
0	Low	<100	100 - 250	>250	Lentil		
65	Low	<100	100 - 250	>250	Lettuce		
32	Low	<100	100 - 250	>250	Lima Bean		
2	Low	<100	100 - 250	>250	Onion		
1	Low	<100	100 - 250	>250	Pea		
0	Low	<100	100 - 250	>250	Potato		
0	Low	<100	100 - 250	>250	Pumpkin		
4	Low	<100	100 - 250	>250	Soybean		
5	Low	<100	100 - 250	>250	Spinach		
3	Low	<100	100 - 250	>250	Tomato		
MISCELLANEOUS							
6	Low	<100	100 - 250	>250	Baker's Yeast		
96	Low	<100	100 - 250	>250	Brewer's Yeast		
0	Low	<100	100 - 250	>250	Cane Sugar		
34	Low	<100	100 - 250	>250	Coffee		
0	Low	<100	100 - 250	>250	Honey		
12	Low	<100	100 - 250	>250	Mushroom		
16	Low	<100	100 - 250	>250	Xanthan Gum		
CANDIDA SCREEN							
438	Avoid	<120	120 - 380	>380	Candida albicans		

MVL Allergy procedure uses both IgE and IgG4 antibodies for combined testing. | References: Volcheck GW. Postgrad Med. 2001 May; 109(5):71. | * Updated reference ranges and new antigens added
 Due to literature documented test sensitivity limitations, negative serum allergy tests should not be used to justify exposure to an allergen that is clinically suspected as the cause of anaphylactic reaction.



A95 Extended Food Panel

6839 Fort Dent Way, Ste 206
Tukwila, WA 98188
tel 206.209.4200 • 855.405.TEST (8378)
fax 206.209.4211

Patient Name: _____ Age: _____ Date of Birth: _____
Accession No: _____ External ID: _____
Doctor/Clinic: _____ Date Collected: _____
Order Doctor: **SAMPLE REPORT** Date Received: _____
Fax#: _____ Date Run: _____
Comments: _____ Date Reported: _____
AGS Updated: _____ Doctor ID: _____ Technician: _____

Final Report

RESULT	Reference Range			ALLERGEN	Low	Moderate	Avoid
	Low	Moderate	Avoid				
DAIRY							
29	Low	<100	100 - 350	>350	Parmesan		
7	Low	<100	100 - 350	>350	Sheep Milk		
22	Low	<100	100 - 350	>350	Yogurt		
MEATS							
891	Avoid	<150	150 - 450	>450	Duck Egg		
3	Low	<100	100 - 250	>250	Duck Meat		
11	Low	<100	100 - 250	>250	Venison		
GRAINS							
21	Low	<100	100 - 250	>250	Amaranth		
20	Low	<100	100 - 250	>250	Arrowroot		
5	Low	<100	100 - 250	>250	Brown Rice		
20	Low	<100	100 - 250	>250	Flaxseed		
0	Low	<100	100 - 250	>250	Hops		
21	Low	<100	100 - 250	>250	Millet		
21	Low	<100	100 - 250	>250	Psyllium Seed		
18	Low	<100	100 - 250	>250	Safflower Seed		
47	Low	<100	100 - 250	>250	Sorghum		
4	Low	<100	100 - 250	>250	Wild Rice		
SPICES							
32	Low	<100	100 - 250	>250	Allspice		
28	Low	<100	100 - 250	>250	Basil		
36	Low	<100	100 - 250	>250	Black Pepper		
25	Low	<100	100 - 250	>250	Cilantro		
4	Low	<100	100 - 250	>250	Cinnamon		
4	Low	<100	100 - 250	>250	Cloves		
40	Low	<100	100 - 250	>250	Coriander		
31	Low	<100	100 - 250	>250	Cumin		
24	Low	<100	100 - 250	>250	Dill		
142	Moderate	<100	100 - 250	>250	Ginger		
4	Low	<100	100 - 250	>250	Horseradish		
306	Avoid	<100	100 - 250	>250	Mustard		
44	Low	<100	100 - 250	>250	Nutmeg		
88	Low	<100	100 - 250	>250	Oregano		
56	Low	<100	100 - 250	>250	Parsley		
13	Low	<100	100 - 250	>250	Peppermint		
23	Low	<100	100 - 250	>250	Poppy Seed		
9	Low	<100	100 - 250	>250	Rosemary		
8	Low	<100	100 - 250	>250	Sage		
32	Low	<100	100 - 250	>250	Spearmint		
17	Low	<100	100 - 250	>250	Tarragon		
0	Low	<100	100 - 250	>250	Thyme		
54	Low	<100	100 - 250	>250	Turmeric		
80	Low	<100	100 - 250	>250	Vanilla		
NUTS							
8	Low	<100	100 - 250	>250	Brazil Nut		
23	Low	<100	100 - 250	>250	Cashew		
42	Low	<100	100 - 250	>250	Chia Seed		
0	Low	<100	100 - 250	>250	Coconut		
1	Low	<100	100 - 250	>250	Hazelnut		
3	Low	<100	100 - 250	>250	Macadamia Nut		
6	Low	<100	100 - 250	>250	Pine Nuts		
3	Low	<100	100 - 250	>250	Pistachio		

MVL Allergy procedure uses for IgE and IgG4 antibodies for combined testing. |
MVL Allergy procedure uses both IgE and IgG4 antibodies for combined testing. |
Due to literature documented test sensitivity limitations, negative serum allergy tests should not be used to justify exposure to an allergen that is clinically suspected as the cause of anaphylactic reaction.



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Patient Name: _____ Age: _____ Date of Birth: _____
Accession No: _____ External ID: _____
Doctor/Clinic: _____ Date Collected: _____
Order Doctor: **SAMPLE REPORT** Date Received: _____
Fax#: _____ Date Run: _____
Comments: _____ Date Reported: _____
AGS Updated: _____ Doctor ID: _____ Technician: _____

Final Report

RESULT	Reference Range			ALLERGEN	Low	Moderate	Avoid
	Low	Moderate	Avoid				
FRUITS							
20	Low	<100	100 - 250	>250	Blackberry		
0	Low	<100	100 - 250	>250	Boysenberry		
0	Low	<100	100 - 250	>250	Cantaloupe		
0	Low	<100	100 - 250	>250	Cherry		
25	Low	<100	100 - 250	>250	Currants		
7	Low	<100	100 - 250	>250	Fig		
52	Low	<100	100 - 250	>250	Kiwi		
0	Low	<100	100 - 250	>250	Mango		
15	Low	<100	100 - 250	>250	Pomegranate		
29	Low	<100	100 - 250	>250	Rhubarb		
0	Low	<100	100 - 250	>250	White Grape		
VEGETABLES							
93	Low	<100	100 - 250	>250	Alfalfa		
5	Low	<100	100 - 250	>250	Artichoke		
47	Low	<100	100 - 250	>250	Bamboo Shoots		
13	Low	<100	100 - 250	>250	Bean Sprouts		
742	Avoid	<100	100 - 250	>250	Black Bean		
25	Low	<100	100 - 250	>250	Bok Choy		
23	Low	<100	100 - 250	>250	Brussels Sprout		
24	Low	<100	100 - 250	>250	Butternut Squash		
12	Low	<100	100 - 250	>250	Chili Pepper		
11	Low	<100	100 - 250	>250	Eggplant		
28	Low	<100	100 - 250	>250	Endive		
8	Low	<100	100 - 250	>250	Garbanzo Bean		
12	Low	<100	100 - 250	>250	Green Olive		
0	Low	<100	100 - 250	>250	Jalapeno		
121	Moderate	<100	100 - 250	>250	Kale		
187	Moderate	<110	110 - 250	>250	Kelp		
45	Low	<100	100 - 250	>250	Kohlrabi		
21	Low	<100	100 - 250	>250	Mung Bean		
792	Avoid	<150	150 - 450	>450	Navy Bean		
43	Low	<100	100 - 250	>250	Okra		
53	Low	<100	100 - 300	>300	Pinto Bean		
41	Low	<100	100 - 250	>250	Radish		
20	Low	<100	100 - 250	>250	Rutabaga		
15	Low	<100	100 - 250	>250	Sweet Potato		
28	Low	<100	100 - 250	>250	Water Chestnut		
63	Low	<100	100 - 250	>250	Watercress		
7	Low	<100	100 - 250	>250	Yam		
9	Low	<100	100 - 250	>250	Yellow Squash		
18	Low	<100	100 - 250	>250	Zucchini		
MISCELLANEOUS							
11	Low	<100	100 - 250	>250	Carob		
11	Low	<100	100 - 250	>250	Cocoa		
1	Low	<100	100 - 250	>250	Corn Starch		
0	Low	<100	100 - 250	>250	Corn Sugar		
12	Low	<100	100 - 250	>250	Maple Sugar		
0	Low	<100	100 - 250	>250	Tapioca		
13	Low	<100	100 - 250	>250	Tea		

MVL Allergy procedure uses for IgE and IgG4 antibodies for combined testing. |
MVL Allergy procedure uses both IgE and IgG4 antibodies for combined testing. |
Due to literature documented test sensitivity limitations, negative serum allergy tests should not be used to justify exposure to an allergen that is clinically suspected as the cause of anaphylactic reaction.

Accession #: **PERSONALIZED FOUR DAY ROTATION FOOD PLAN**
 Patient Name: **SAMPLE REPORT**
 Data File:



PERSONALIZED FOUR DAY ROTATION FOOD PLAN - DAY 1 CHOICES

Proteins	Dairy	Grains/Flour	Legumes	Vegetables	Fruits	Nuts,Seeds,Oils	Herbs,Spices	Miscellaneous
buffalo	goat milk	BARLEY	mung bean	bamboo shoots	BANANA	cashew	basil	baker's yeast
cod	hemp milk	glutadin	pinto bean	bean sprouts	fig	chia seed	black pepper	brewer's yeast
oyster	oat milk	gluten		black olive	papaya	olive oil	cilantro	cane sugar
tilapia	sheep milk	hemp		carrot	red grape	pistachio	coriander	carob
venison		oat		celery	white grape	psyllium seed	cumin	grape juice concentrate used as sweetener
		sorghum		green olive			dill	mushroom
		wheat		hops			oregano	peppermint
				mushroom			parsley	peppermint tea
				sweet potato			peppermint	spearmint tea
				water chestnut			rosemary	xanthan gum
				yellow squash			sage	
							spearmint	
							thyme	

PERSONALIZED FOUR DAY ROTATION FOOD PLAN - DAY 2 CHOICES

Proteins	Dairy	Grains/Flour	Legumes	Vegetables	Fruits	Nuts,Seeds,Oils	Herbs,Spices	Miscellaneous
crab	ALMOND MILK	arrowroot		beet	apple mix	ALMOND	allspice	apple used as sweetener
lobster	potato milk	potato flour		eggplant	blackberry	coconut	cloves	black tea
salmon		potato starch		green bell pepper	blueberry	macadamia nut	poppy seed	coconut used as sweetener
trout		quinoa		jalapeno	boysenberry	safflower oil	red chili pepper	green tea
		tapioca flour		okra	cranberry	safflower seed	vanilla	pear used as sweetener
				potato	currants			pear used as sweetener
				red chili pepper	kiwi			tapioca
				spinach	pear			
				tomato	PINEAPPLE			

PERSONALIZED FOUR DAY ROTATION FOOD PLAN - DAY 3 CHOICES

Proteins	Dairy	Grains/Flour	Legumes	Vegetables	Fruits	Nuts,Seeds,Oils	Herbs,Spices	Miscellaneous
beef	casein	amaranth	garbanzo bean	alfalfa	avocado	hazelnut	GARLIC	coffee
clam	cheddar cheese	buckwheat	lentil	asparagus	cantaloupe	peanut	GINGER	corn sugar
halibut	cottage cheese	corn	lima bean	avocado	mango	peanut oil	nutmeg	honey
lamb	COW'S MILK	corn starch	soybean	butternut squash	rhubarb	pecan	turmeric	
pork	mozzarella cheese			cucumber	watermelon	pumpkin seed		
sole	cheese			GARLIC		soy oil		
tofu	parmesan cheese			onion		walnut		
	soy milk			pea		walnut oil		
	WHEY			pumpkin				
	yogurt			zucchini				

PERSONALIZED FOUR DAY ROTATION FOOD PLAN - DAY 4 CHOICES

Proteins	Dairy	Grains/Flour	Legumes	Vegetables	Fruits	Nuts,Seeds,Oils	Herbs,Spices	Miscellaneous
chicken	rice milk	brown rice		artichoke	apricot	brazil nut	cinnamon	cocoa
duck meat	sesame seed milk	millet		bok choy	cherry	flaxseed	horseradish	maple sugar
sardine		rice		broccoli	grapefruit	flaxseed oil	tarragon	maple syrup
shrimp		sunchoke flour		brussels sprout	lemon	pine nuts		
tuna		wild rice		cabbage	orange	sesame oil		
turkey				cauliflower	peach	sesame seed		
				endive	plum	sunflower oil		
				KALE	pomegranate	sunflower seed		
				KELP	raspberry			
				kohlrabi	strawberry			
				lettuce				
				radish				
				rutabaga				
				watercress				
				yam				

KEY: low reaction = lowercase

MODERATE = UPPERCASE

SIGNIFICANT = IS NOT LISTED IN ROTATION

Accession #: **FOUR DAY ROTATION FOOD PLAN - SUMMARY OF FOOD**
 Patient Name: **SAMPLE REPORT**
 Data File:



FOUR DAY ROTATION FOOD PLAN - SUMMARY OF FOOD

LOW REACTION FOODS						
Alfalfa	Allspice	Amaranth	Apple Mix	Apricot	Arrowroot	Artichoke
Asparagus	Avocado	Baker's Yeast	Bamboo Shoots	Basil	Bean Sprouts	Beef
Beet	Black Olive	Black Pepper	Blackberry	Blueberry	Bok Choy	Boysenberry
Brazil Nut	Brewer's Yeast	Broccoli	Brown Rice	Brussels Sprout	Buckwheat	Buffalo
Butternut Squash	Cabbage	Cane Sugar	Cantaloupe	Carob	Carrot	Casein
Cashew	Cauliflower	Celery	Cheddar Cheese	Cherry	Chia Seed	Chicken
Chili Pepper	Cilantro	Cinnamon	Clam	Cloves	Cocoa	Coconut
Cod	Coffee	Coriander	Corn	Corn Starch	Corn Sugar	Cottage Cheese
Crab	Cranberry	Cucumber	Cumin	Currants	Dill	Duck Meat
Eggplant	Endive	Fig	Flaxseed	Garbanzo Bean	Glutadin	Gluten
Goat's Milk	Grapefruit	Green Olive	Green Pepper	Halibut	Hazelnut	Hemp
Honey	Hops	Horseradish	Jalapeno	Kiwi	Kohlrabi	Lamb
Lemon	Lentil	Lettuce	Lima Bean	Lobster	Macadamia Nut	Mango
Maple Sugar	Millet	Mozzarella Cheese	Mung Bean	Mushroom	Nutmeg	Oat
Okra	Onion	Orange	Oregano	Oyster	Papaya	Parmesan
Parsley	Pea	Peach	Peanut	Pear	Pecan	Peppermint
Pine Nuts	Pinto Bean	Pistachio	Plum	Pomegranate	Poppy Seed	Pork
Potato	Psyllium Seed	Pumpkin	Pumpkin Seed	Quinoa	Radish	Raspberry
Red Grape	Rhubarb	Rice	Rosemary	Rutabaga	Safflower Seed	Sage
Salmon	Sardine	Sesame Seed	Sheep Milk	Shrimp	Sole	Sorghum
Soybean	Spearmint	Spinach	Strawberry	Sunflower Seed	Sweet Potato	Tapioca
Tarragon	Tea	Teff	Thyme	Tilapia	Tomato	Trout
Tuna	Turkey	Turmeric	Vanilla	Venison	Walnut	Water Chestnut
Watercress	Watermelon	Wheat	White Grape	Wild Rice	Xanthan Gum	Yam
Yellow Squash	Yogurt	Zucchini				

MODERATE CONSUMPTION - MAY EAT ONCE EVERY FOUR DAYS

ALMOND	BANANA	BARLEY	COW'S MILK	GARLIC	GINGER	KALE
KELP	PINEAPPLE	WHEY				

AVOID THESE FOODS

BLACK BEAN	DUCK EGG	EGG WHITE	EGG YOLK	GREEN BEAN	KIDNEY BEAN	MUSTARD
NAVY BEAN						

PENDING RESULTS

KEY: low reaction = lowercase

MODERATE = UPPERCASE

SIGNIFICANT = IS NOT LISTED IN ROTATION

Comprehensive ULTIMATE Hormone Profile

Doctor ID	Patient Name Doe, John			
Age 55	Sex M	Date of Birth	Accession #	Test Code 4100
Date Collected	Date Received	Date Reported	Tech	
Comments				

Doctor Name and Address:

SAMPLE REPORT
 For female report, see pages 9-10

	Amount Excreted in 24hrs	Adult Reference Range
CREATININE	2.6 gm/24hr HIGH	0.5-2.0 gm/24hr
TOTAL VOLUME	1550 mL	
If Creatinine Value is out of normal range, results may be affected.		
STERIOD	Amount Excreted in µg/24hr	Male µg/24hr

ESTRONE	6.7	3 - 11.4 *
ESTRADIOL	3.0	0.8 - 4.6 *
ESTRIOL	6.5	3.5 - 13.7 *
Total Estrogens	16.2	7.3 - 29.7 *
2-OH ESTRONE	2.2	1.9 - 15.8 **
16α-OH ESTRONE	1.9	0.2 - 5.9 **
2 / 16α Ratio	1.2 LOW	1.2 - 4.9 **

** For male patient, the reference range values are for research only.

Comprehensive ULTIMATE Hormone Profile

Patient Name: SAMPLE REPORT
 Accession #: Test ID Test Code: 4100

STERIOD	Amount Excreted in µg/24hr	Adult Reference Range Male µg/24hr
PREGNANEDIOL (progesterone metabolite)	164	70-1050 *
DHEA	906	100 - 2000
TESTOSTERONE	87.1	20.0 - 200.0
5α-ANDROSTANEDIOL	108.3	22.0 - 131.0
5β-ANDROSTANEDIOL	128.8	40.0 - 401.0
ANDROSTERONE	3172	2000 - 5000
ETIOCHOLANOLONE	1748	1400 - 5000
PREGNANETRIOL	831	200 - 1500
CORTISONE (E)	198	31-209
CORTISOL (F)	152	30-170
TETRAHYDROCORTISONE (THE)	6069	2100-7400
ALLO-TETRAHYDROCORTISOL (5α-THF)	2076	700-3800
TETRAHYDROCORTISOL (THF)	2160	1200-4500
11β-HYDROXYANDROSTERONE	1204	613-2298
11β-HYDROXYETIOCHOLANOLONE	597	153-950
ALDOSTERONE	10.1	3.0 - 21.8 **
ALLO-TETRAHYDROCORTICOSTERONE (5α-THB)	329	130-600
TETRAHYDROCORTICOSTERONE (THB)	145	30-240
11-DEHYDROTETRAHYDROCORTICOSTERONE (THA)	230	76-456



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Comprehensive ULTIMATE Hormone Profile

Doctor ID	Patient Name Doe, John			
Age	Sex	Date of Birth	Accession #	Test Code
55	M			4100
Date Collected	Date Received	Date Reported	Tech	
			DH	
Comments				

Doctor Name and Address:

SAMPLE REPORT
 For female report, see pages 9-10

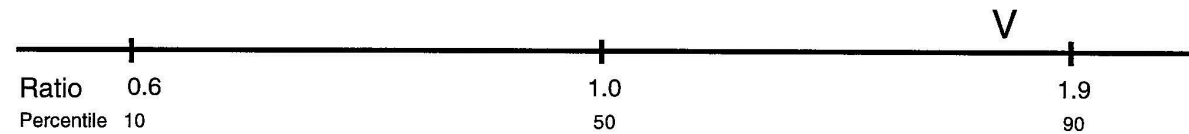
Urinary HGH	Amount Excreted in pg/24hr	Adult Reference Range
Human Growth Hormone	1660	1065 - 4722 pg/24hr
Urinary Oxytocin	Amount Excreted in pmol/24hr	Adult Reference Range
* Oxytocin	396	250 - 1300 pmol/24hr
Urinary Melatonin Analytes	Amount Excreted	Adult Reference Range
Melatonin	18.5	9.1 - 57.3 ng/24hr
6-Sulfatoxymelatonin	16.7	8.3 - 39.7 µg/24hr
Urinary Thyroid	Amount Excreted in ng/24hr	Adult Reference Range
Free T3	756	300 - 1100 ng/24hr **
Free T4	1054	450 - 2000 ng/24hr **
Urinary Mineral	Amount Excreted in mmol/24h	Adult Reference Range
Sodium	177	40 - 220 mmol/24hr
Potassium	122	25 - 150 mmol/24hr
Sodium/Potassium Ratio	1.4	1.2 - 4.8
Urinary Nitrates	Amount Excreted in µmol/24hr	Adult Reference Range
Total Urine Nitrates	2700	600 - 3100 µmol/24hr

Patient Name: SAMPLE REPORT
 Accession #: Test ID Test Code: 4100

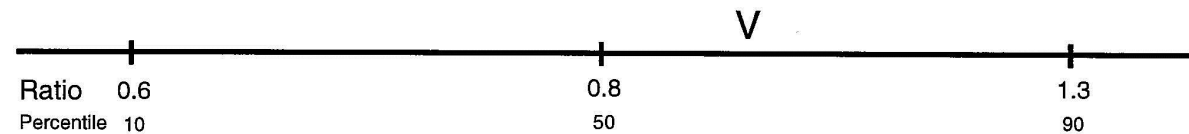
ENZYME ACTIVITY PHENOTYPE ASSESSMENT

5α-REDUCTASE

Androsterone/Etiocholanolone Ratio: 1.81



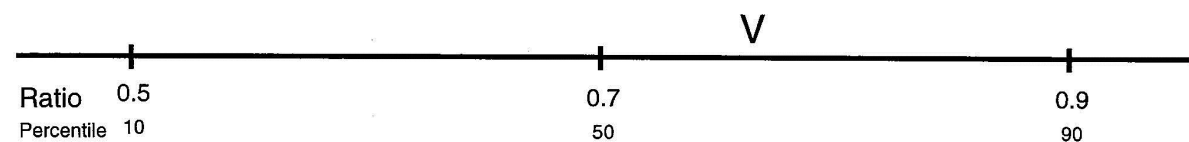
Allo-tetrahydrocortisol/tetrahydrocortisol Ratio: 0.96



Elevated 5α-reductase activity is associated with polycystic ovary syndrome and hirsutism in women, benign prostate hypertrophy and premature baldness in men, and obesity and insulin resistance in both genders. Low 5α-reductase activity may result in reduced conversion of testosterone to DHT and undervirilization in males.

11β-hydroxysteroid dehydrogenase II (11β-HSD II)

Cortisol/Cortisone Ratio: 0.77



11β-HSD II is predominantly a renal enzyme. It inactivates cortisol in order to prevent competitive binding to mineralocorticoid receptors. Its activity can be measured by the ratio of cortisol/cortisone. An elevated ratio (toward right on the graph) indicates suppressed enzyme activity, and may be clinically related to stress, hypertension, high dose licorice, or cortisol administration.



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Testosterone Metabolites Profile

Doctor ID		Patient Name			
Age	Sex	Date of Birth	Accession #	Test Code 4417	
Date Collected	Date Received	Date Reported	Tech		
Comments					

Doctor Name and Address:

SAMPLE REPORT

Test	Result (ng/mL)		Male Reference Range (ng/mL)
Androstenedione	0.7		0.5 - 2.2
Testosterone (Te)	9.1	High	2.6 - 8.9
DHT (5 α -Dihydrotestosterone)	0.30		0.24 - 0.84
<i>Te/DHT Ratio</i>	30.3	High	7.9 - 15.2
5 α -Androstane-3 β ,17 β -diol (3 β -Adiol)	1.1	Low	4.0 - 20.2
5 α -Androstane-3 α ,17 β -diol (3 α -Adiol)	1.4	Low	2.3 - 10.5
<i>3β-Adiol/(DHT + 3α-Adiol) Ratio</i>	0.6	Low	0.8 - 6.5

Tests performed by LC-MS/MS

Clinical Reference: A. G. Oliveira et al., Steroids 72, 914-922 (2007)



CLIA: 50D0630590

Complete Blood Viscosity Profile

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Accession Number:	Age: 67	Date Collected:	Date Run:
Patient Name: SAMPLE REPORT	Sex: M	Date Received:	ReportDate:
OutsidePatientID:	DOB:	Doctor ID:	Tech:
Doctor Name:	Height: 5ft 6in		FaxNumber:
	Weight: 148 lb	Phlebotomy Vol: 205.33 mL/month	
Comments: Critical call to Dr. 11.6.14 @3:30 pm			

Blood Viscosity Test Results

Test	Out of range	Results	Reference Range	Units
Systolic	High	47.3	30 - 44	mP
Diastolic	High	159	74 - 126	mP

CBC Test Results

Test	Out of range	Results	Reference Range	Units
White Blood Cells		4.8	3.8 - 10.8	K/ μ L
Red Blood Cells		5.33	4.2 - 5.8	M/ μ L
Hemoglobin		16.1	13.2 - 17.1	g/dl
Hematocrit		47.3	38.5 - 50	%
MCV		88.7	80 - 100	fL
MCH		30.2	27 - 33	pg
MCHC		34	32 - 36	g/dl
RDW		13.5	11 - 15	%
Platelets		302	140 - 400	K/ μ L
BUN		16	7 - 25	mg/d
Creatinine		1.05	0.7 - 1.25	mg/d

Blood Viscosity Results Interpretation

Systolic Result	Diastolic Result	Comments/Investigations	Potential Interventions
50	150	Severe Hyperviscosity Check LDL, Tg, glucose Check Hct for mild-moderate erythrocytosis	Therapeutic phlebotomy per phlebotomy algorithm Nattokinase supplementation; hydration
44	126	Mild to Moderate Hyperviscosity Check LDL, Tg, glucose Check Hct for mild-moderate erythrocytosis	Hydration; nattokinase supplementation Determine if patient is eligible for phlebotomy
42	111	Reference Range High	Hydration; natokinase supplementation Determine if patient is eligible for phlebotomy
37	89	Optimum Range	
30	74	Reference Range Low Hypoviscosity Check Hct/Hg for anemia Check medications	Dietary changes or medications for anemia correction Dosage changes or stop administering medication(s)



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Kraft Prediabetes Profile (Bloodspot)

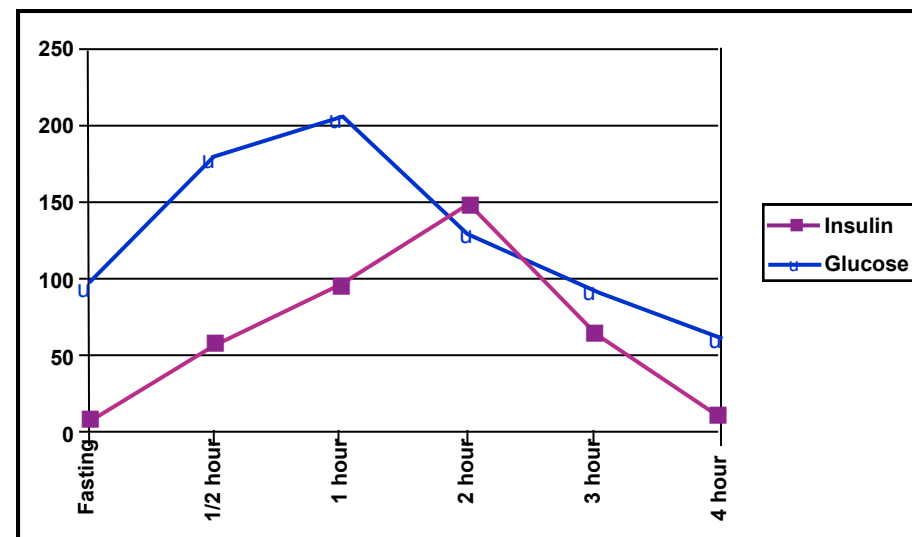
Doctor ID		Patient Name			
Age	Sex	Date of Birth	Accession #	Test Code	
43	M			4100	
Date Collected	Date Received	Date Reported	Tech		
Comments					
Pattern III-a					

Doctor Name and Address:

SAMPLE REPORT

X axis	Y axis	
	Insulin (mIU/mL)	Glucose (mg/dL)
Fasting:	8.19	96
1/2 hour:	58.18	178
1 hour:	95.13	204
2 hour:	147.37 H	131
3 hour:	64.95	91
4 hour:	10.22	62
2nd + 3rd hr:	212.32	

Associated Reference Ranges	
Fasting Insulin	Fasting Glucose
0-10: Normal	65-99: Normal
	100-124: Impaired Glucose Tolerance
	> 126: Diabetes Mellitus
	Oral Glucose Tolerance Test
At 2 Hours:	At 2 Hours:
< 50: Normal	< 140: Normal
	140-199: Impaired Glucose Tolerance
	>199: Diabetes Mellitus



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Microdigestive Panel

Doctor ID		Patient Name			
Age	Sex	Date of Birth	Accession #	Test Code	
				6010	
Date Collected	Date Received	Date Reported	Tech		
Comments					

Doctor Name and Address:

SAMPLE REPORT

Test	Result	Abnormal Result	Normal Range
MICROSCOPIC EXAM			
Neutral Fats	0-15/HPF	Yes	0 - 7 /HPF
Starch	0 /HPF		0 /HPF
Undigested Meat Fibers	0-1 /HPF	Yes	0 /HPF
Vegetable Fibers	12-18 /HPF	Yes	0 - 5 /HPF
WBC	0-3 /HPF		0 - 3 /HPF
RBC	0-3 /HPF	Yes	0 - 1 /HPF
Yeast	0-4 /HPF		0 - 5 /HPF
Steatocrit	9.0 %	Yes - High	0 - 8.8 %

COMMENTS:

NEUTRAL FAT:

Over 7/HPF and/or steatocrit over 8.8% suggests pancreatic insufficiency or possible biliary tree blockage, also found in patients with rapid intestinal motility due to food allergies.

SUGGESTED FOLLOW-UP: Pancreatic sufficiency test, pancreatic enzyme replacement therapy challenge. Food allergy (ELISA) test should also be performed to rule out food allergies. Repeat test on abnormal results after follow-up.

UNDIGESTED MEAT FIBERS:

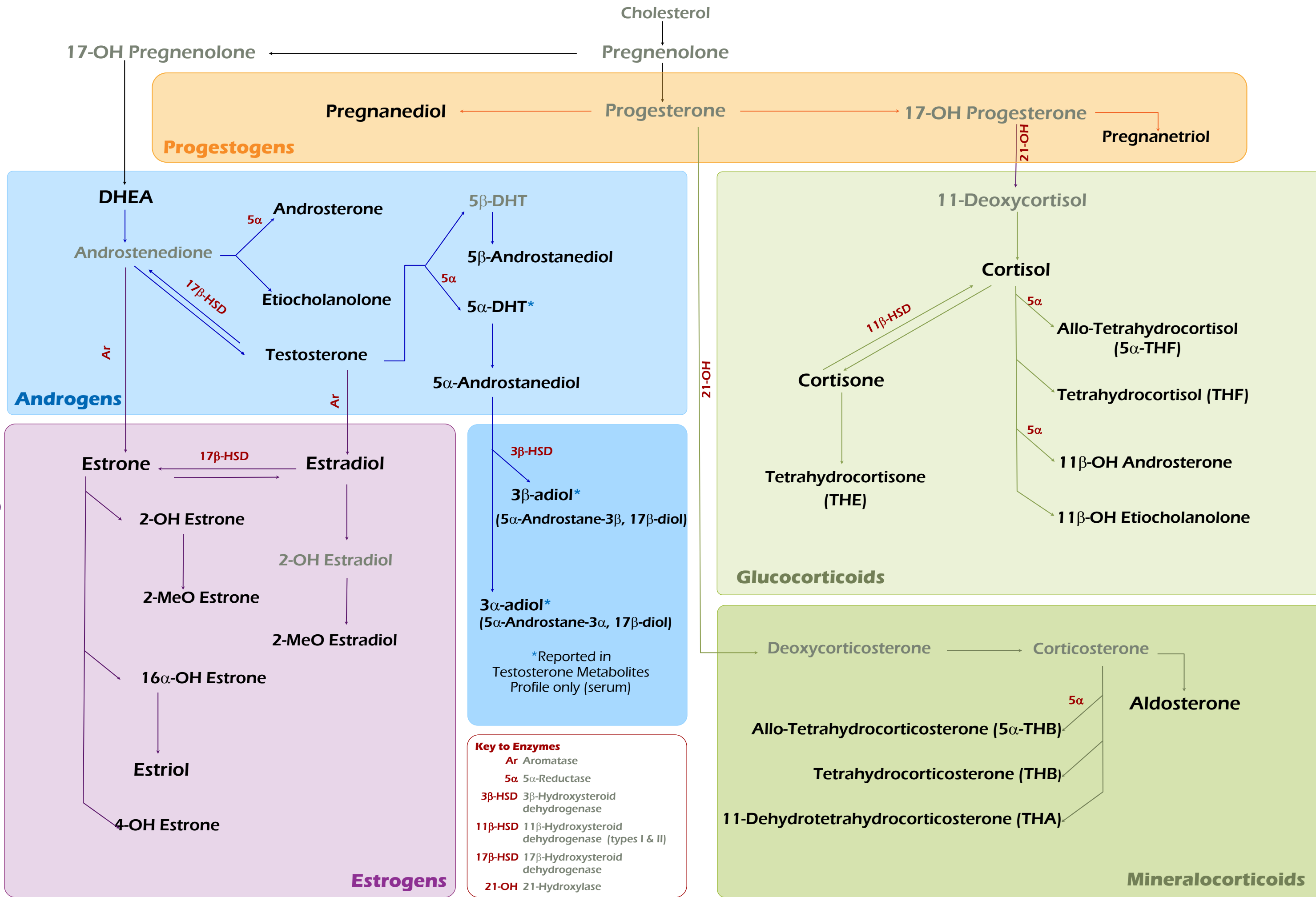
If 0-2/HPF are seen, and there is no evidence of digestive difficulty, this may be normal. However, more than 2/HPF may be an indication of insufficient stomach HCL and pepsin production. This may interfere with proper protein breakdown in the gut. Decreased HCL secretion is associated with vitamin B12 deficiency. Decreased HCL also leads to an alkaline intestinal environment, which may result in bowel flora imbalance.

SUGGESTED FOLLOW-UP: Heidelberg Capsule Gastric Analysis or Betaine HCL and Pepsin challenge.

VEGETABLE FIBERS:

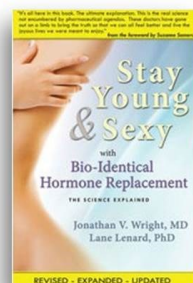
Over 5/HPF suggests a pancreatic enzyme deficiency. This may be due to either a weak pancreas or an insufficient acid bolus of food entering the intestine and signaling the pancreas to turn on.

SUGGESTED FOLLOW-UP: Repeat microscopic exam for vegetable and fiber remnants. Check results of meat fibers, digestion and pH. A qualitative test that



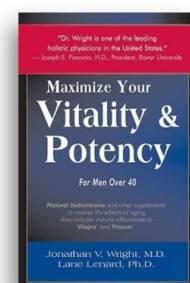
Metabolites in black are reported in Meridian Valley Lab panels.

Stay Young & Sexy with Bio-Identical Hormone Replacement: The Science Explained.
Jonathan Wright, MD and Lane Lenard, PhD.

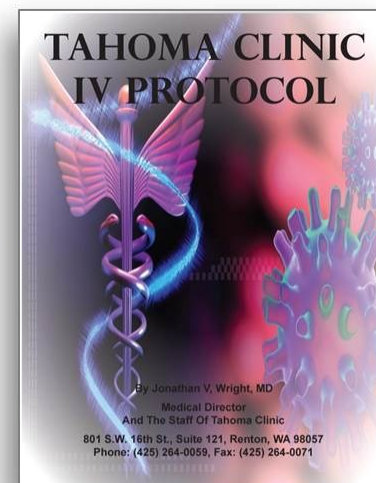


Drs. Wright and Lenard lay out the case for bio-identical hormones, citing studies from over 40 years of research and presenting medical case studies. Easy to read for a lay person, it is also an invaluable resource for the medical professional. Paperback.

Maximize Your Vitality and Potency: For Men Over 40.
Jonathan Wright, MD and Lane Lenard, PhD.



What Drs. Wright and Lenard do for women in *Stay Young and Sexy*, they do for men in this valuable volume that provides research support and practical information about male hormone replacement. Accessible to the lay audience, it also includes the research back-up important to health-care professionals. Paperback.



Tahoma Clinic IV Protocol Guide

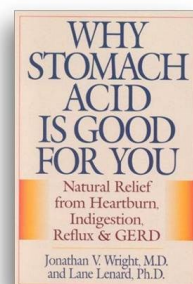
Contains more than 40 time-tested IV protocols developed by Dr. Wright and others and used in the Tahoma Clinic, along with osmolality tables and references. Pages are enclosed in plastic sheet protectors for use in the IV room without concern for spills and splashes and are contained in a three-ring binder for ease of use.

IV Protocols (drip and push) Include:

- Anti-Hypertension
- Anti-Arrhythmia
- Anti-Viral
- Heavy Metal Chelation
- Silicone Detoxification
- Diabetic Trace Mineral
- Migraine
- Myer's Cocktail
- Anti-Glaucoma
- Anti-Shingles
- Asthma Spasmolytic
- Malnutrition
- Phospholipid
- Trace Minerals
- WBC Stimulation
- TRH Stimulation test

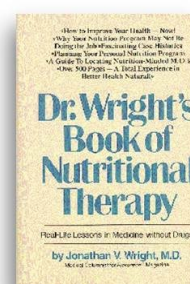
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Jonathan V. Wright, MD and Lane Lenard, PhD



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Jonathan V. Wright, MD



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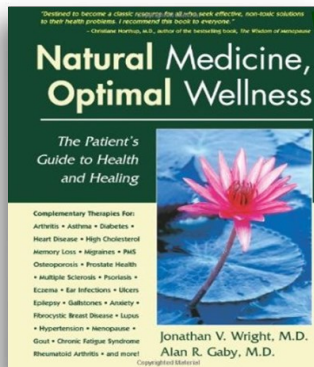
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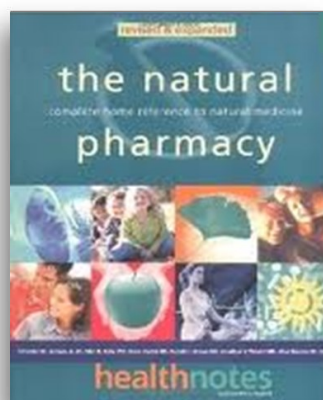


Natural Medicine, Optimal Wellness
Jonathan V. Wright, MD and Alan R. Gaby, MD

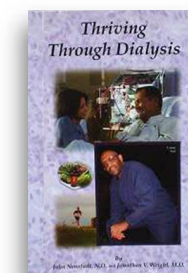
This book explains how natural medicines can be used to prevent and treat illness and promote health. Drs. Wright and Gaby begin with foundational information about diet, digestion, allergies and hormones. Dr. Wright follows with a discussion - in a case-based format - of specific conditions and how natural medicines can help. Dr. Gaby concludes with a well-referenced scientific review of the evidence behind the therapies. Large format paperback.

The Natural Pharmacy: Complete Home Reference Manual to Natural Medicine
Revised and Expanded
Schuyler W. Lininger, Jr. DC, Alan R. Gaby MD, Steve Austin ND, Donald J. Brown ND, Jonathan V. Wright MD, Alice Duncan DC, CCH

A combination of four encyclopedias in one, this book provides A through Z information on health concerns, nutritional supplements, herbs and homeopathic remedies. Each with copious references and citations. Large format paperback.



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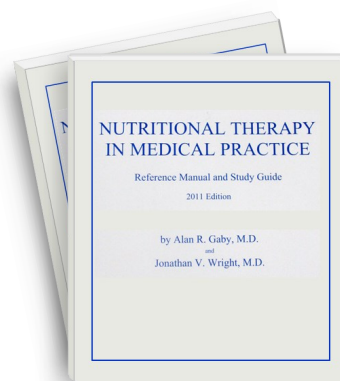


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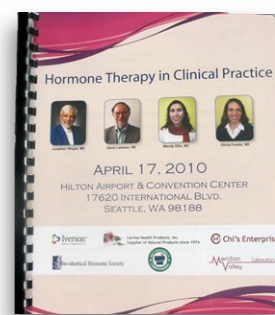
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Hormone Therapy in Clinical Practice
Jonathan V. Wright, MD and the Tahoma Clinic Physicians

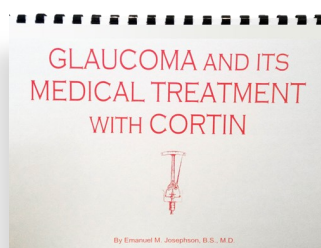
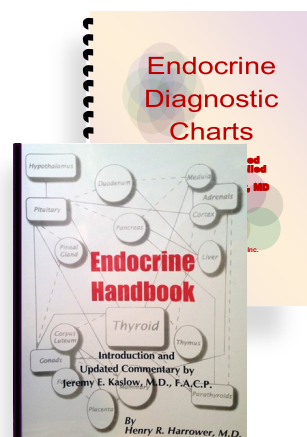
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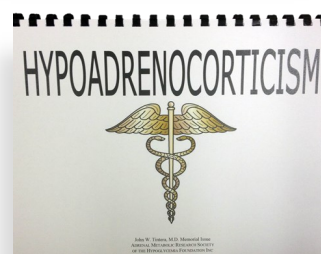
Endocrine Handbook and Endocrine Diagnostic Charts
Henry R. Harrower, MD

Published in 1939 and 1929 respectively, Dr. Harrower provides a pre-laboratory glimpse of endocrinology. Treatment focuses heavily on the use of glandular "organotherapy." Comb bound.



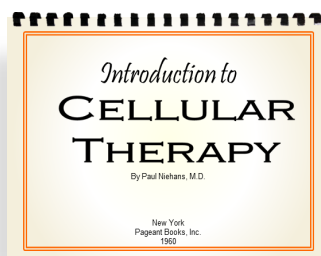
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Emanuel M. Josephson, MD

Published in 1937, Dr. Josephson reviews the use of adrenal cortical extract in the treatment of glaucoma amidst the conventional medical understanding of the day. Comb bound.



Hypoadrenocorticism
John W. Tintera, MD

Hypoadrenocorticism is a collection of six articles reprinted from the 1950s and 60s. Dr. Tintera delves into the general ramifications of low adrenocortical hormone production and then broadens the discussion to include EENT allergy, schizophrenia and alcoholism. Comb bound.



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Paul Niehans, MD

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