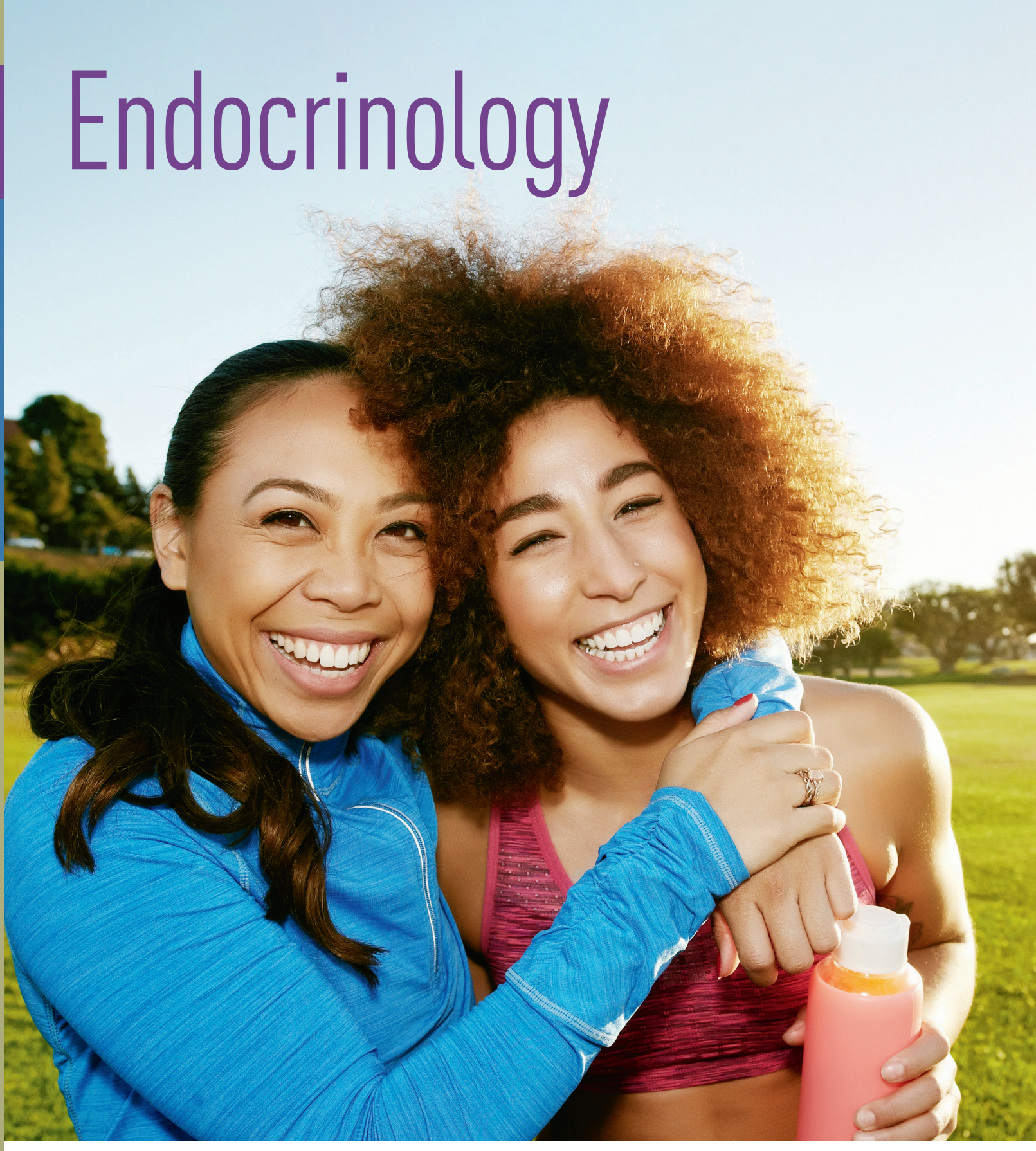
Endocrinology



Comprehensive Assessment of Neuroendocrine Status

- Salivary Sex Steroid Hormones and Adrenal/HPA Axis Function
- Hormone and Urinary Metabolites Assessment Profile (HuMap™)
- Neurotransmitter and Metabolites Profiles
- Thyroid Profile

DOCTOR'S DATA INC.

SCIENCE + INSIGHT

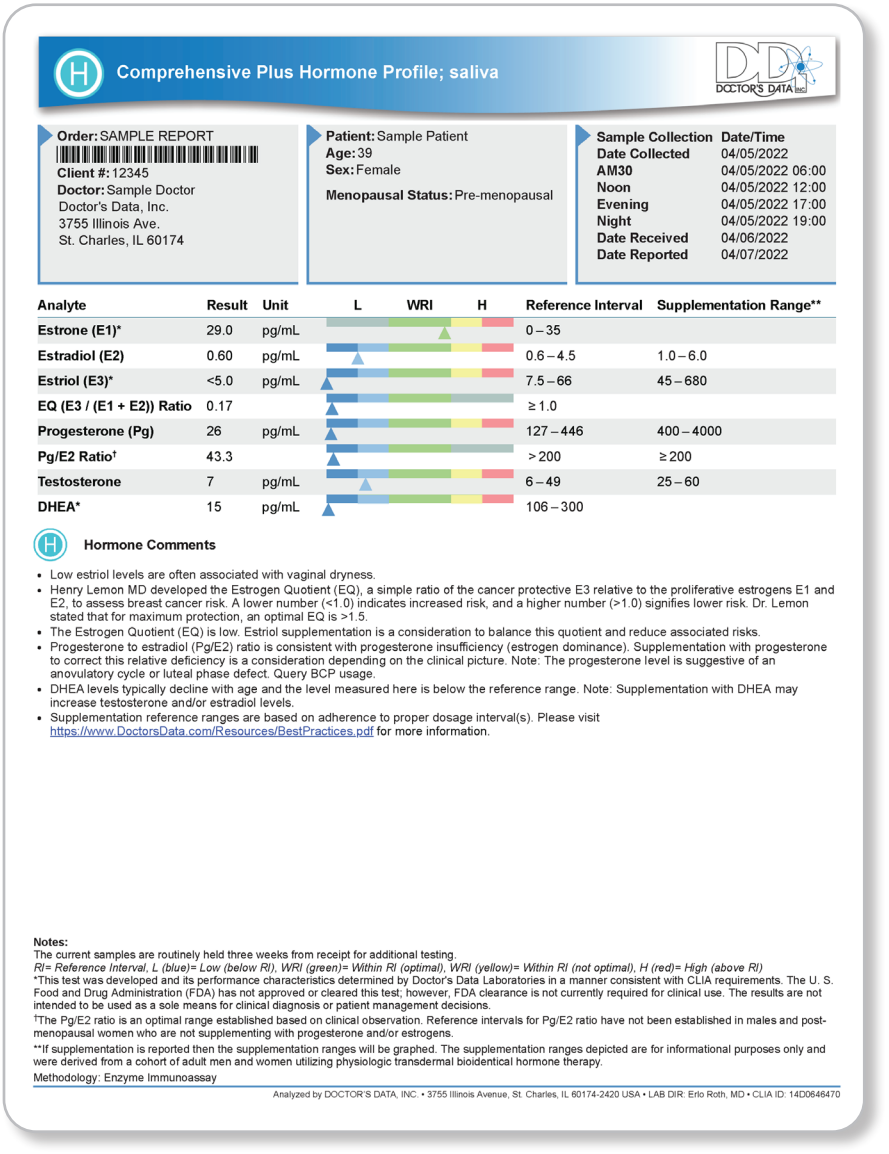
Endocrinology

Doctor's Data offers analysis of hormones, neurotransmitters, and metabolites that may impact symptoms, metabolic function, mood or behavior.

Salivary Sex Steroid Hormones and HPA Axis/Adrenal Function

Saliva Testing

Saliva contains only the active, bioavailable portion of the body's hormones, which are secreted in a pulsatile manner. Doctor's Data salivary testing accounts for the normal pulsatile secretion of hormones by averaging 4 collections to give a better idea of how best to treat. This method is noninvasive, and easy to collect, which is particularly beneficial for diurnal cortisol, CAR (Cortisol Awakening Response), and luteal surge testing. Many providers consider saliva testing for determining clinical diagnosis and to monitor any route of hormone replacement therapy. Saliva testing is the matrix of choice to monitor transdermal and sublingual hormone therapies.



Comprehensive Plus Hormone Profile; saliva

DOCTOR'S DATA

Order: SAMPLE REPORT
Client #: 12345
Doctor: Sample Doctor
Doctor's Data, Inc.
3755 Illinois Ave.
St. Charles, IL 60174

Patient: Sample Patient
Age: 39
Sex: Female
Menopausal Status: Pre-menopausal

Sample Collection	Date/Time
Date Collected	04/05/2022
AM30	04/05/2022 06:00
Noon	04/05/2022 12:00
Evening	04/05/2022 17:00
Night	04/05/2022 19:00
Date Received	04/06/2022
Date Reported	04/07/2022

Analyte	Result	Unit	L	WRI	H	Reference Interval	Supplementation Range**
Estrone (E1)*	29.0	pg/mL				0 – 35	
Estradiol (E2)	0.60	pg/mL				0.6 – 4.5	1.0 – 6.0
Estriol (E3)*	<5.0	pg/mL				7.5 – 66	45 – 680
EQ (E3 / (E1 + E2)) Ratio	0.17					≥ 1.0	
Progesterone (Pg)	26	pg/mL				127 – 446	400 – 4000
Pg/E2 Ratio†	43.3					> 200	≥ 200
Testosterone	7	pg/mL				6 – 49	25 – 60
DHEA*	15	pg/mL				106 – 300	

Hormone Comments

- Low estriol levels are often associated with vaginal dryness.
- Henry Lemon MD developed the Estrogen Quotient (EQ), a simple ratio of the cancer protective E3 relative to the proliferative estrogens E1 and E2, to assess breast cancer risk. A lower number (<1.0) indicates increased risk, and a higher number (>1.0) signifies lower risk. Dr. Lemon stated that for maximum protection, an optimal EQ is >1.5.
- The Estrogen Quotient (EQ) is low. Estriol supplementation is a consideration to balance this quotient and reduce associated risks.
- Progesterone to estradiol (Pg/E2) ratio is consistent with progesterone insufficiency (estrogen dominance). Supplementation with progesterone to correct this relative deficiency is a consideration depending on the clinical picture. Note: The progesterone level is suggestive of an anovulatory cycle or luteal phase defect. Query BCP usage.
- DHEA levels typically decline with age and the level measured here is below the reference range. Note: Supplementation with DHEA may increase testosterone and/or estradiol levels.
- Supplementation reference ranges are based on adherence to proper dosage interval(s). Please visit https://www.DoctorsData.com/Resources/BestPractices.pdf for more information.

Notes:
The current samples are routinely held three weeks from receipt for additional testing.
RI= Reference Interval, L (blue)= Low (below RI), WRI (green)= Within RI (optimal), WRI (yellow)= Within RI (not optimal), H (red)= High (above RI)
*This test was developed and its performance characteristics determined by Doctor's Data Laboratories in a manner consistent with CLIA requirements. The U. S. Food and Drug Administration (FDA) has not approved or cleared this test; however, FDA clearance is not currently required for clinical use. The results are not intended to be used as a sole means for clinical diagnosis or patient management decisions.
†The Pg/E2 ratio is an optimal range established based on clinical observation. Reference intervals for Pg/E2 ratio have not been established in males and post-menopausal women who are not supplementing with progesterone and/or estrogens.
**If supplementation is reported then the supplementation ranges will be graphed. The supplementation ranges depicted are for informational purposes only and were derived from a cohort of adult men and women utilizing physiologic transdermal bioidentical hormone therapy.
Methodology: Enzyme Immunoassay

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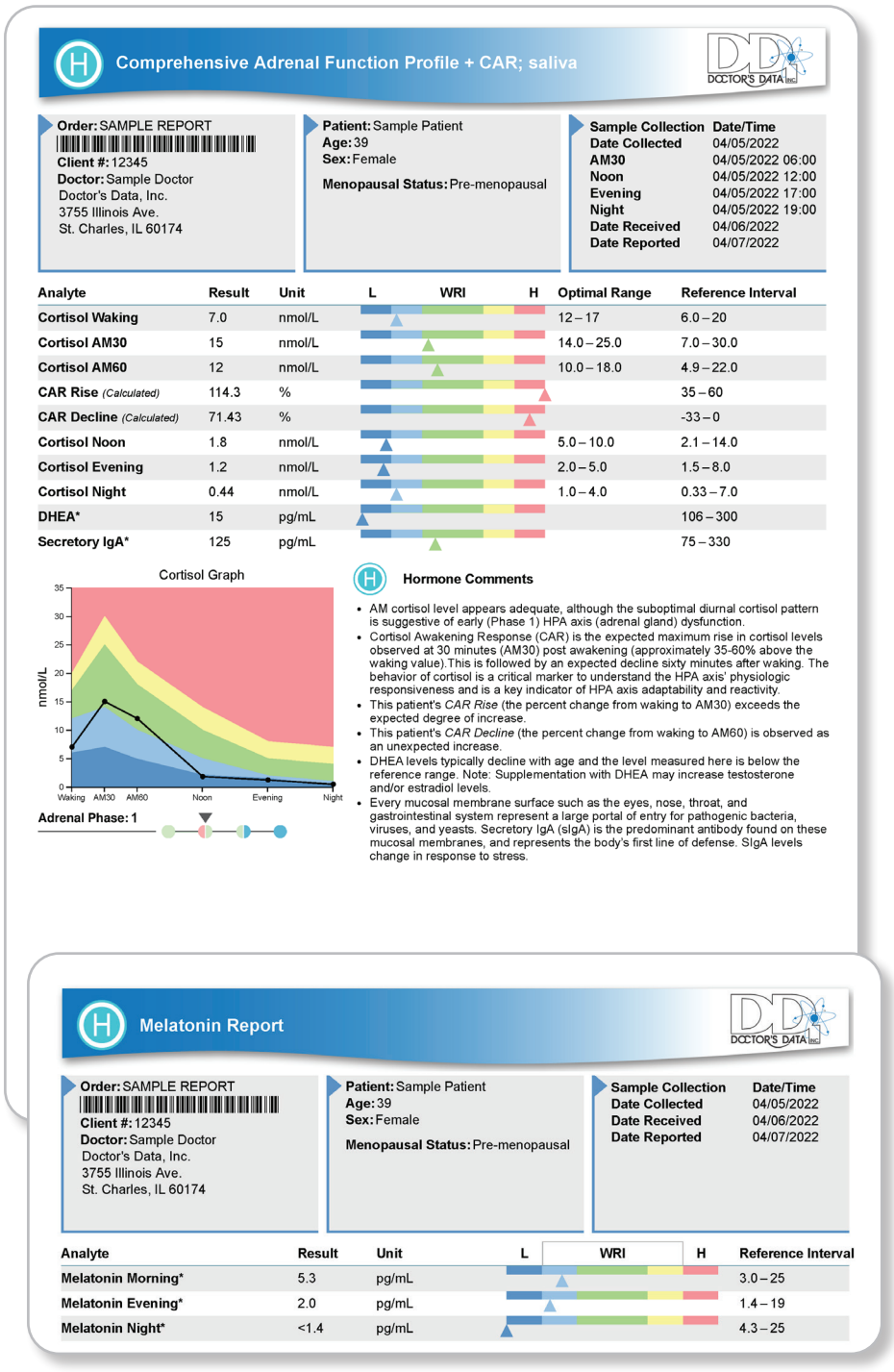
HPA Axis/Adrenal Function Testing

Cortisol profiles from Doctor's Data require four saliva samples taken at 30 minutes post-awakening, noon, dinner and bed time. These points capture the diurnal rhythm of cortisol secretion and can identify dysregulation in the natural cortisol circadian rhythm.

The cortisol awakening response (CAR) is the natural rise in cortisol that is seen minutes after awakening, followed by a noticeable drop within 60 minutes. CAR can be utilized as a biomarker for assessment of the HPA axis function in routine clinical practice—it can be influenced by overall HPA reactivity, as well as a person's anticipation of stress. Combined with the 30-minute post-awakening collection, Doctor's Data measures CAR with two additional saliva collections—one immediately upon waking and the other at 60 minutes post-awakening. The CAR Profile can be ordered alone or added to any cortisol profile with an AM30 collection.



Comprehensive Adrenal Function Profile + CAR; saliva

DOCTOR'S DATA Inc

Order: SAMPLE REPORT
Client #: 12345
Doctor: Sample Doctor
Doctor's Data, Inc.
3755 Illinois Ave.
St. Charles, IL 60174

Patient: Sample Patient
Age: 39
Sex: Female
Menopausal Status: Pre-menopausal

Sample Collection	Date/Time
Date Collected	04/05/2022
AM30	04/05/2022 06:00
Noon	04/05/2022 12:00
Evening	04/05/2022 17:00
Night	04/05/2022 19:00
Date Received	04/06/2022
Date Reported	04/07/2022

Analyte	Result	Unit	L	WRI	H	Optimal Range	Reference Interval
Cortisol Waking	7.0	nmol/L				12 – 17	6.0 – 20
Cortisol AM30	15	nmol/L				14.0 – 25.0	7.0 – 30.0
Cortisol AM60	12	nmol/L				10.0 – 18.0	4.9 – 22.0
CAR Rise *(Calculated)*	114.3	%					35 – 60
CAR Decline *(Calculated)*	71.43	%					-33 – 0
Cortisol Noon	1.8	nmol/L				5.0 – 10.0	2.1 – 14.0
Cortisol Evening	1.2	nmol/L				2.0 – 5.0	1.5 – 8.0
Cortisol Night	0.44	nmol/L				1.0 – 4.0	0.33 – 7.0
DHEA*	15	pg/mL					106 – 300
Secretory IgA*	125	pg/mL					75 – 330

Cortisol Graph

Adrenal Phase: 1

Hormone Comments

- AM cortisol level appears adequate, although the suboptimal diurnal cortisol pattern is suggestive of early (Phase 1) HPA axis (adrenal gland) dysfunction.
- Cortisol Awakening Response (CAR) is the expected maximum rise in cortisol levels observed at 30 minutes (AM30) post awakening (approximately 35-60% above the waking value).This is followed by an expected decline sixty minutes after waking. The behavior of cortisol is a critical marker to understand the HPA axis' physiologic responsiveness and is a key indicator of HPA axis adaptability and reactivity.
- This patient's *CAR Rise* (the percent change from waking to AM30) exceeds the expected degree of increase.
- This patient's *CAR Decline* (the percent change from waking to AM60) is observed as an unexpected increase.
- DHEA levels typically decline with age and the level measured here is below the reference range. Note: Supplementation with DHEA may increase testosterone and/or estradiol levels.
- Every mucosal membrane surface such as the eyes, nose, throat, and gastrointestinal system represent a large portal of entry for pathogenic bacteria, viruses, and yeasts. Secretory IgA (sIgA) is the predominant antibody found on these mucosal membranes, and represents the body's first line of defense. SIgA levels change in response to stress.

Melatonin Report

DOCTOR'S DATA Inc

Order: SAMPLE REPORT
Client #: 12345
Doctor: Sample Doctor
Doctor's Data, Inc.
3755 Illinois Ave.
St. Charles, IL 60174

Patient: Sample Patient
Age: 39
Sex: Female
Menopausal Status: Pre-menopausal

Sample Collection	Date/Time
Date Collected	04/05/2022
Date Received	04/06/2022
Date Reported	04/07/2022

Analyte	Result	Unit	L	WRI	H	Reference Interval
Melatonin Morning*	5.3	pg/mL				3.0 – 25
Melatonin Evening*	2.0	pg/mL				1.4 – 19
Melatonin Night*	<1.4	pg/mL				4.3 – 25

Secretory IgA (sIgA)

SIgA is most often measured in stool or saliva. Measuring sIgA in stool can reveal information about gut immunity, inflammation, recent or current infections, and potential acute or chronic stress generally associated with GALT (gut-associated lymphoid tissue). SIgA measured in the saliva primarily provides insight into the body's stress response. However, there is some evidence that activated B cells can migrate from GALT to salivary glands, which could potentially demonstrate systemic inflammation and possibly link GI pathology via salivary sampling.

Melatonin

Melatonin is a hormone that also acts as a neurotransmitter. It is the major indole compound synthesized by the pineal gland and is converted from serotonin. Melatonin levels follow a diurnal rhythm in response to the light/dark cycle, with melatonin and light occurring at opposite times. Endogenous melatonin production begins rising approximately two hours before bedtime, provided light is dim. Melatonin and cortisol share an inverse relationship—when melatonin levels are low, cortisol levels should be high, and vice versa.

Clinical Relevance and Patient Compliance

Free, unbound sex steroid hormones can fluctuate throughout the day and thus have many peaks and troughs. In order to obtain the most clinically accurate and truly representative results of an individual's hormone status, Doctor's Data averages four saliva specimens, collected throughout the day, to minimize the risk of reporting a peak or trough. We go an extra step to deliver the most clinically relevant results—a fifth tube of saliva is created by pooling an equal amount of saliva from each of the four submitted samples. This pooled tube is mixed thoroughly to provide homogenization and becomes the saliva source from which estriol, estradiol, estrone, progesterone, testosterone and DHEA are measured. This additional effort provides a far superior reflection of each patient's hormonal status. Convenient, easy and low-stress sample collection, with no needles or 24-hour urine collection, greatly increases patient compliance.

Doctor's Data pooled tube methodology equalizes hormone peaks and troughs for

a more precise illustration of your patients' sex hormone status

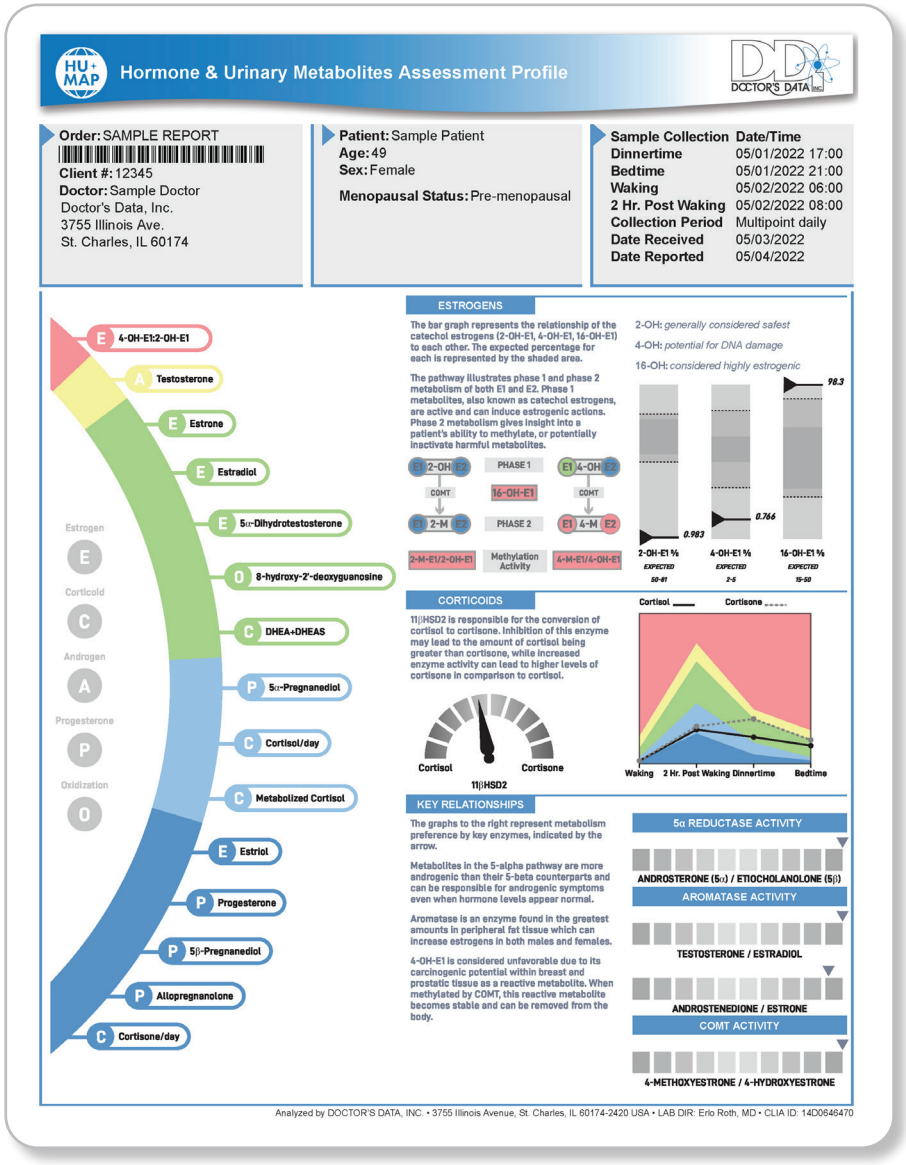
Salivary Hormone and HPA Axis/Adrenal Function Profiles

	Comprehensive Plus Profile	Comprehensive Hormone Profile	Basic Hormone Profile	Comprehensive Adrenal Function Profile	Adrenal Function Profile	Diurnal Cortisol Profile	CAR Profile	Melatonin Profile
Estrone	✓							
Estradiol	✓	✓	✓					
Estriol	✓							
Progesterone	✓	✓	✓					
Testosterone	✓	✓	✓					
DHEA	✓	✓	✓	✓	✓			
Cortisol	x4	x4	x2	x4	x4	x4	x3	
Melatonin								x3
sIgA				✓				
PG/E2 Ratio	✓	✓	✓					
Estrogen Quotient	✓							

CAR, sIgA and melatonin can be added to profiles. Smaller profiles and single-analyte tests are also available. Call Doctor's Data for assistance in selecting the tests that will maximize value for your patients.

Hormone and Urinary Metabolites Assessment Profile (HuMap™)

The Hormone and Urinary Metabolite Assessment Profile (HuMap™) provides a complete overview of steroid hormones, their metabolites, and the efficiency of the enzymes that metabolize these hormones. This non-invasive test requires only 4 or 5 separate urine collections. Because the breakdown of hormones relies so heavily on processes within the liver, this test can also elucidate areas of interest as it pertains to conjugation of each metabolite. Additionally, testing urinary hormone metabolites can contribute to further understanding of endogenous hormone secretion, supplemental hormone utilization, enzyme activity, oxidative stress, and insight into whether your body is safely metabolizing hormones.



- Color-coded results and expanded metabolic pathways specific to each patient
- Summary page to highlight important findings
- Key enzyme activity
- Full commentary

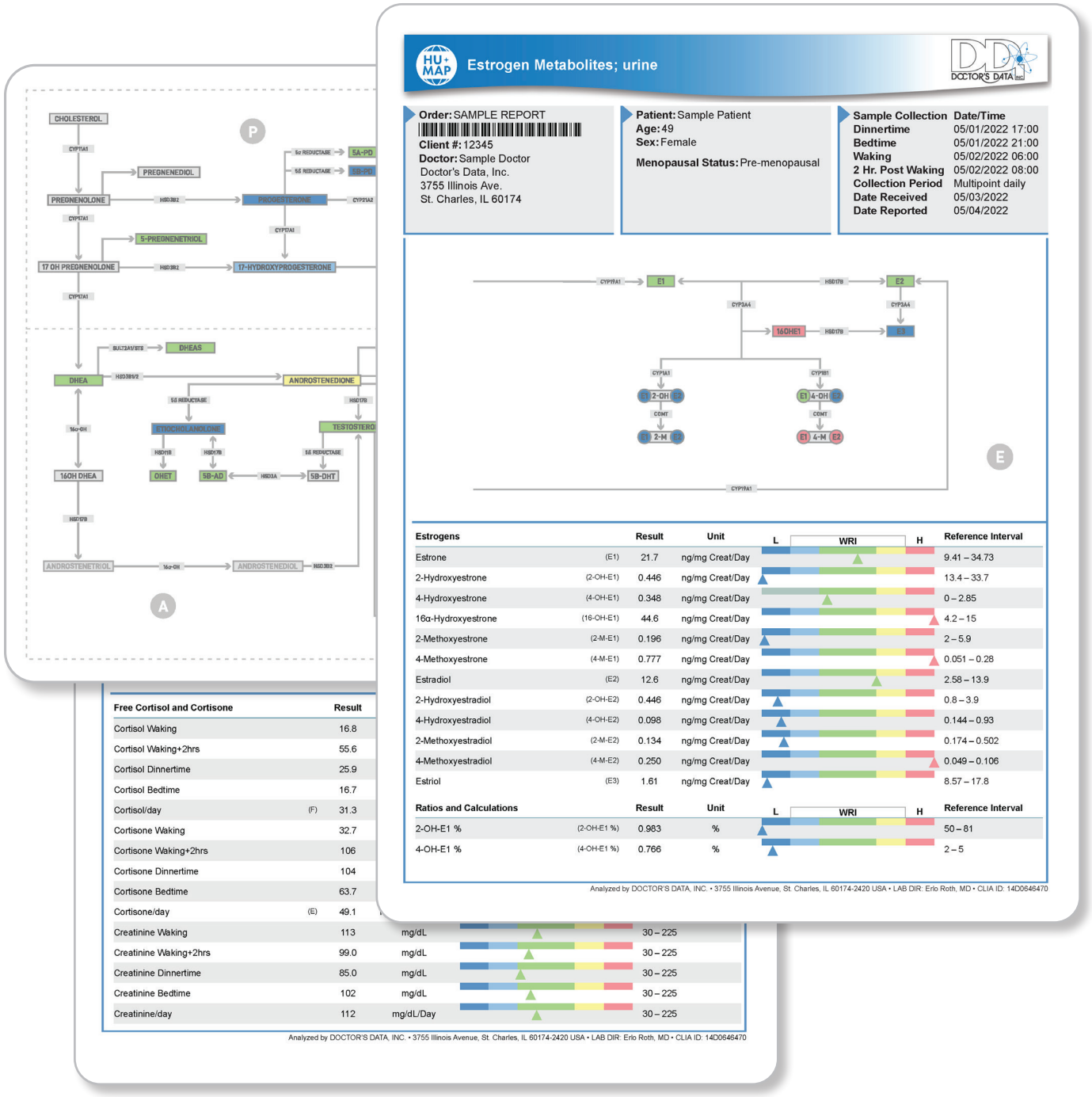
Comprehensive Hormone and Metabolite Markers Available in the HuMap™

- Extensive estrogen metabolites available: *E1, E2, E3, 2-OH-E1/E2, 4-OH-E1/E2, 16-OH-E1, 2-Methoxy-E1/E2, 4-Methoxy-E1/E2*
- Comprehensive androgens and metabolites
- Progesterone and metabolites
- Daily cortisol (5), Daily cortisone (5)
- Metabolized cortisol, cortisone, and corticosterone
- Key enzyme activity: *COMT, 11βHSD2, aromatase, and 5a-reductase*
- Biomarker for Oxidative DNA Damage: *8-hydroxy-2'-deoxyguanosine (8-OHdG)*

The HuMap™ is the most comprehensive urinary metabolite profile offered by Doctor's Data and is designed to provide deep insight into the secretion and metabolism of unconjugated sex hormones and their metabolites, and the enzymes that fuel these conversions. Doctor's Data also offers smaller profiles that assess a more select set of hormones and metabolites, allowing for more targeted assessment for initial assessment as well as follow-up testing.

	HuMap™	Sex Hormones Profile	Androgens and Progesterones Profile	Adrenal Corticoids Profile	Estrogen Metabolites Profile
Estrogens Fractionated: E1, E2, E3, 2-OH-E1, 4-OH-E1, 16-OH-E1, 2-M-E1, 4-M-E1, 2-OH-E2, 4-OH-E2, 2-M-E2, and 4-M-E2	✓	✓			✓
Androstenedione (A4)	✓	✓	✓		
EPI-Testosterone (EPI-T)	✓	✓	✓		
Testosterone (T)	✓	✓	✓		
Androsterone (AN)	✓	✓	✓		
11-hydroxy-Androsterone (OHAN)	✓	✓	✓		
5a-Androstanediol (5A-AD)	✓	✓	✓		
5-Dihydrotestosterone (5A-DHT)	✓	✓	✓		
Etiocholanolone (ET)	✓	✓	✓		
11-hydroxy-Etiocholanolone (OHET)	✓	✓	✓		
5-Androstanediol (5B-AD)	✓	✓	✓		
Dehydroepiandrosterone (DHEA)	✓	✓	✓	✓	
Dehydroepiandrosterone Sulfate (DHEAS)	✓	✓	✓	✓	
Progesterone	✓	✓	✓		
5-Pregnanediol (5A-PD)	✓	✓	✓		
5-Pregnanediol (5B-PD)	✓	✓	✓		
Allopregnanolone (ALLOP)	✓	✓	✓		
21-Hydroxyprogesterone (21-OHP)	✓	✓	✓		
17-Hydroxyprogesterone (17-OHP)	✓	✓	✓		
5-pregnanetriol (metabolite of 17-OHP)	✓	✓	✓		
Cortisol and Cortisone	x5			x5	
Corticosterone (B)	✓			✓	
Tetrahydrodehydrocorticosterone (THA)	✓			✓	
5-Tetrahydrocorticosterone (5B-THB)	✓			✓	
5a-Tetrahydrocorticosterone (5A-THB)	✓			✓	
11-Deoxycortisol (11-DOC)	✓			✓	
5a-Tetrahydrocortisol (5A-THF)	✓			✓	
5-Tetrahydrocortisol (5B-THF)	✓			✓	
Tetrahydrocortisone (THE)	✓			✓	
8-hydroxy-2'-deoxyguanosine (8-OHdG)	✓				
Key Enzyme Activity	✓				

Expanded Metabolic Pathways and Full Commentary included in the HuMap™



HU+MAP **Estrogen Metabolites; urine**

DOCTOR'S DATA

Order: SAMPLE REPORT
Client #: 12345
Doctor: Sample Doctor
Doctor's Data, Inc.
3755 Illinois Ave.
St. Charles, IL 60174

Patient: Sample Patient
Age: 49
Sex: Female
Menopausal Status: Pre-menopausal

Sample Collection	Date/Time
Dinnertime	05/01/2022 17:00
Bedtime	05/01/2022 21:00
Waking	05/02/2022 06:00
2 Hr. Post Waking	05/02/2022 08:00
Collection Period	Multipoint daily
Date Received	05/03/2022
Date Reported	05/04/2022

Estrogens		Result	Unit	L WRI H	Reference Interval
Estrone	(E1)	21.7	ng/mg Creat/Day		9.41 – 34.73
2-Hydroxyestrone	(2-OH-E1)	0.446	ng/mg Creat/Day		13.4 – 33.7
4-Hydroxyestrone	(4-OH-E1)	0.348	ng/mg Creat/Day		0 – 2.85
16α-Hydroxyestrone	(16-OH-E1)	44.6	ng/mg Creat/Day		4.2 – 15
2-Methoxyestrone	(2-M-E1)	0.196	ng/mg Creat/Day		2 – 5.9
4-Methoxyestrone	(4-M-E1)	0.777	ng/mg Creat/Day		0.051 – 0.28
Estradiol	(E2)	12.6	ng/mg Creat/Day		2.58 – 13.9
2-Hydroxyestradiol	(2-OH-E2)	0.446	ng/mg Creat/Day		0.8 – 3.9
4-Hydroxyestradiol	(4-OH-E2)	0.098	ng/mg Creat/Day		0.144 – 0.93
2-Methoxyestradiol	(2-M-E2)	0.134	ng/mg Creat/Day		0.174 – 0.502
4-Methoxyestradiol	(4-M-E2)	0.250	ng/mg Creat/Day		0.049 – 0.106
Estriol	(E3)	1.61	ng/mg Creat/Day		8.57 – 17.8

Ratios and Calculations		Result	Unit	L WRI H	Reference Interval
2-OH-E1 %	(2-OH-E1 %)	0.983	%		50 – 81
4-OH-E1 %	(4-OH-E1 %)	0.766	%		2 – 5

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Free Cortisol and Cortisone		Result	Unit	L WRI H	Reference Interval
Cortisol Waking		16.8			
Cortisol Waking+2hrs		55.6			
Cortisol Dinnertime		25.9			
Cortisol Bedtime		16.7			
Cortisol/day	(F)	31.3			
Cortisone Waking		32.7			
Cortisone Waking+2hrs		106			
Cortisone Dinnertime		104			
Cortisone Bedtime		63.7			
Cortisone/day	(E)	49.1			
Creatinine Waking		113	mg/dL		30 – 225
Creatinine Waking+2hrs		99.0	mg/dL		30 – 225
Creatinine Dinnertime		85.0	mg/dL		30 – 225
Creatinine Bedtime		102	mg/dL		30 – 225
Creatinine/day		112	mg/dL/Day		30 – 225

Analyzed by DOCTOR'S DATA, INC. • 3755 Illinois Avenue, St. Charles, IL 60174-2420 USA • LAB DIR: Erlo Roth, MD • CLIA ID: 14D0646470

Much like a human fingerprint, metabolism is inherently unique to everyone. Understanding how the major hormones of the body are metabolized, as well as the activity of the enzymes responsible for metabolism, is a rare glimpse into a patient's health.

Convenience, Clinical Utility and Researched Methodology of the HuMap™

Enhanced Specificity and Specificity

Liquid chromatography (LC) tandem mass spectrometry (MS) is an extremely sensitive and specific way to measure many substances. In the case of urinary steroid hormone testing, LC-MS is used to determine both free hormone and their metabolite amounts in urine. Put simply, both parts work together to figure out the exact amount of each hormone component in a patient sample. LC separates hormones in a liquid urine sample, which are then injected at various times for MS analysis. MS technology monitors the injected sample for specific hormones based on their molecular weights and expected injection times (commonly called retention times). Tandem MS verifies each hormone identity based on fragmentation and determines its amount. The combination of LC and tandem MS allows for extremely sensitive and specific hormone measurements, even in samples containing similar substances that would interfere with other methods.

Ability to Test Neurotransmitters from HuMap Urine Specmens

Many of the symptoms that would drive one to test urinary metabolite imbalance in a patient (fatigue, sleep difficulties, stress, mood concerns, cognitive concerns, vasomotor symptoms) can also be influenced by neurotransmitter imbalance. Additionally, the COMT (Catechol-O-Methyltransferase) enzyme plays an essential role in estrogen metabolism as well as catecholamine metabolism. Issues with COMT activity can result in both estrogen metabolite and neurotransmitter imbalance. Adding neurotransmitter testing to HuMap provides a deeper dive into the biochemistry that may be contributing to a patient's symptom picture. Providers can choose to add on the NeuroBasic or Comprehensive Neurotransmitter Profile to the same urine samples for additional convenience to the patient.

Advantages of Liquid Urine Collection

The main advantage of liquid urine collection is enhanced sensitivity, especially for low concentration metabolites. Dried urine must be reconstituted from the filter paper once the sample arrives. This reconstitution can lead to loss of polar steroid metabolites or creatinine for some patient samples. With liquid urine, samples can be shipped after being frozen for 4-6 hours, can be processed faster, and concentrated further to enhance the detection of low-level analytes. Steroids are also quite stable in properly preserved liquid urine.

When to Consider the HuMap™ for your Patients

Women

Breast Health

Endometriosis

PCOS

PMS/PMDD

Menopausal Symptoms

Men

Erectile Dysfunction

Prostate Health

Loss of Muscle Mass

Breast Health

General

Metabolic Syndrome

Thyroid Pathologies

Inflammation

Oxidative Stress

Fatigue/Insomnia

Libido

Mood or Cognitive Concerns

Family History of Hormone-Driven Cancers

HRT/BHRT Utilization

Weight Gain

Urine and Saliva Testing for BHRT

Urinary hormone and metabolite testing is uniquely suited to provide insight into how hormones and their metabolites are moving through the body as well as risk assessment from the generation of certain metabolites. When using urinary metabolite testing, the level of detectable unconjugated sex hormone levels is not representative of circulating or bioavailable tissue hormone levels, because urine is not reflective of tissue uptake. When the goal of testing is to understand bioavailable levels of hormones, salivary testing may be a better option, especially if utilizing topical hormones.

Neurotransmitter Profiles

URINE

Urinary neurotransmitter profiles provide insight into a patient's overall ability to synthesize and metabolize neurotransmitters. Neurotransmitters are secreted from pre-synaptic neurons into the synapse between nerve cells to stimulate receptors on post-synaptic neurons. These chemical messengers regulate many physical and emotional processes including movement, stress response, cognition, emotions, energy, cravings, pain and more. Doctor's Data Neurotransmitter profiles help identify alterations in urinary neurotransmitter status which may be associated with a variety of conditions from metabolic to behavioral disorders.

Value in Clinical Practice

Analysis of neurotransmitters and their metabolites provides a non-invasive assessment of neurotransmitter status. A review of current scientific literature indicates that neurotransmitter testing may be useful in a variety of areas:

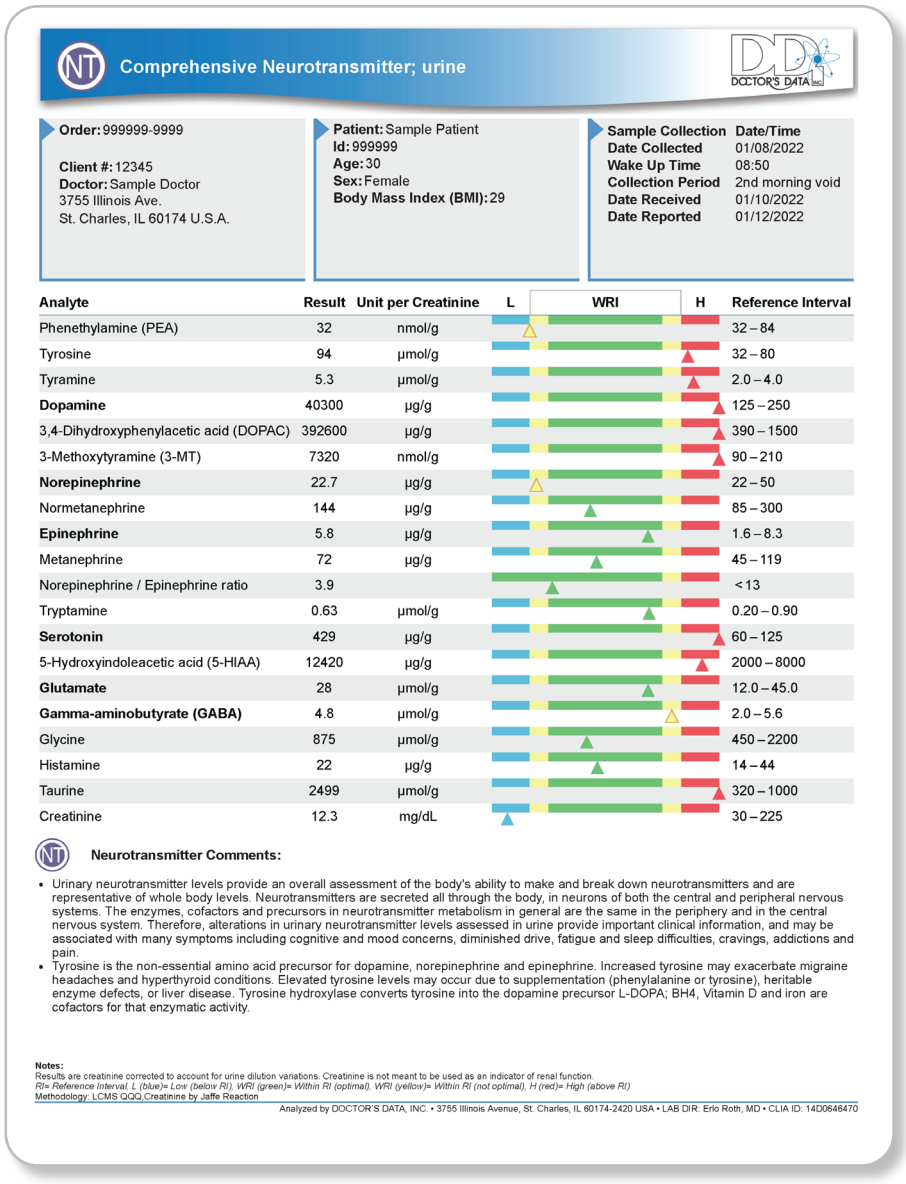
Identification of Imbalances—Research indicates that urinary neurotransmitter levels may correlate with conditions such as depression and PTSD. Further clinical associations have also been made with imbalances in neurotransmitters and:

- Other mood disorders
- HPA axis (adrenal) dysfunction: fatigue, insomnia
- Loss of mental focus: ADD, ADHD, cognitive concerns
- Cravings, addiction and dependency
- Hormonal imbalances: estrogen dominance (progesterone insufficiency), estrogen deficiency, androgen imbalance
- Loss of appetite control: obesity and insulin resistance

Functional Testing - Neurotransmitter metabolism is mediated by catechol-O-methyltransferase (COMT), monoamine oxidase (MAO), and other enzymes. Test results may provide functional information about these important enzymes.

Response to Therapy—Neurotransmitters (serotonin, for example) may be altered by the addition of precursor amino acids such as 5-hydroxytryptophan (5-HTP). These changes may be apparent in the urine.

Toxicology Risk Assessment—Changes in urinary neurotransmitters like serotonin, dopamine, and glutamate may be clinically relevant outcomes for neurobehavioral toxicology resulting from chemical or environmental exposures.



Comprehensive Neurotransmitter; urine

DOCTOR'S DATA

Order: 999999-9999
Client #: 12345
Doctor: Sample Doctor
3755 Illinois Ave.
St. Charles, IL 60174 U.S.A.

Patient: Sample Patient
Id: 999999
Age: 30
Sex: Female
Body Mass Index (BMI): 29

Sample Collection	Date/Time
Date Collected	01/08/2022
Wake Up Time	08:50
Collection Period	2nd morning void
Date Received	01/10/2022
Date Reported	01/12/2022

Analyte	Result	Unit per Creatinine	L	WRI	H	Reference Interval
Phenethylamine (PEA)	32	nmol/g				32 – 84
Tyrosine	94	µmol/g				32 – 80
Tyramine	5.3	µmol/g				2.0 – 4.0
Dopamine	40300	µg/g				125 – 250
3,4-Dihydroxyphenylacetic acid (DOPAC)	392600	µg/g				390 – 1500
3-Methoxytyramine (3-MT)	7320	nmol/g				90 – 210
Norepinephrine	22.7	µg/g				22 – 50
Normetanephrine	144	µg/g				85 – 300
Epinephrine	5.8	µg/g				1.6 – 8.3
Metanephrine	72	µg/g				45 – 119
Norepinephrine / Epinephrine ratio	3.9					< 13
Tryptamine	0.63	µmol/g				0.20 – 0.90
Serotonin	429	µg/g				60 – 125
5-Hydroxyindoleacetic acid (5-HIAA)	12420	µg/g				2000 – 8000
Glutamate	28	µmol/g				12.0 – 45.0
Gamma-aminobutyrate (GABA)	4.8	µmol/g				2.0 – 5.6
Glycine	875	µmol/g				450 – 2200
Histamine	22	µg/g				14 – 44
Taurine	2499	µmol/g				320 – 1000
Creatinine	12.3	mg/dL				30 – 225

Neurotransmitter Comments:

- Urinary neurotransmitter levels provide an overall assessment of the body's ability to make and break down neurotransmitters and are representative of whole body levels. Neurotransmitters are secreted all through the body, in neurons of both the central and peripheral nervous systems. The enzymes, cofactors and precursors in neurotransmitter metabolism in general are the same in the periphery and in the central nervous system. Therefore, alterations in urinary neurotransmitter levels assessed in urine provide important clinical information, and may be associated with many symptoms including cognitive and mood concerns, diminished drive, fatigue and sleep difficulties, cravings, addictions and pain.
- Tyrosine is the non-essential amino acid precursor for dopamine, norepinephrine and epinephrine. Increased tyrosine may exacerbate migraine headaches and hyperthyroid conditions. Elevated tyrosine levels may occur due to supplementation (phenylalanine or tyrosine), heritable enzyme defects, or liver disease. Tyrosine hydroxylase converts tyrosine into the dopamine precursor L-DOPA; BH4, Vitamin D and iron are cofactors for that enzymatic activity.

Notes:
Results are creatinine corrected to account for urine dilution variations. Creatinine is not meant to be used as an indicator of renal function.
RI= Reference Interval, L (blue)= Low (below RI), WRI (green)= Within RI (optimal), WRI (yellow)= Within RI (not optimal), H (red)= High (above RI)
Methodology: LCMS QQQ,Creatinine by Jaffe Reaction

Analyzed by DOCTOR'S DATA, INC. • 3755 Illinois Avenue, St. Charles, IL 60174-2420 USA • LAB DIR: Erlo Roth, MD • CLIA ID: 14D0646470

Which Profile to Consider

The NeuroBasic Profile offers a broad-brush assessment that covers most clinical needs and which many providers find highly clinically relevant and useful. For providers interested in a more comprehensive look at neurotransmitter secretion and the metabolism of these markers, the Comprehensive Neurotransmitter Profile includes catecholamine and serotonin metabolites, trace amines, and additional markers that expand the clinical view.

	Comprehensive Neurotransmitter Profile	NeuroBasic Profile	NeuroAdrenal Profile
	URINE	URINE	URINE / SALIVA
Serotonin	✓	✓	✓
GABA	✓	✓	✓
Dopamine	✓	✓	✓
Norepinephrine	✓	✓	✓
Epinephrine	✓	✓	✓
Glutamate	✓	✓	✓
Histamine	✓	✓	✓
PEA (Phenethylamine)	✓	✓	✓
5-HIAA (5-Hydroxyindolacetic acid)	✓		
Glycine	✓	✓	✓
Taurine	✓		
Tryptamine	✓		
Tyroamine	✓		
Tyrosine	✓		
DOPAC (3,4 Dihydroxyphenylacetic acid)	✓		
3-MT (3-Methoxytyramine)	✓		
Metanephrine Fractionation (Metanephrine, Normetanephrine)	✓		
Creatinine	✓	✓	✓
Cortisol			x4
DHEA			✓

Thyroid Profile

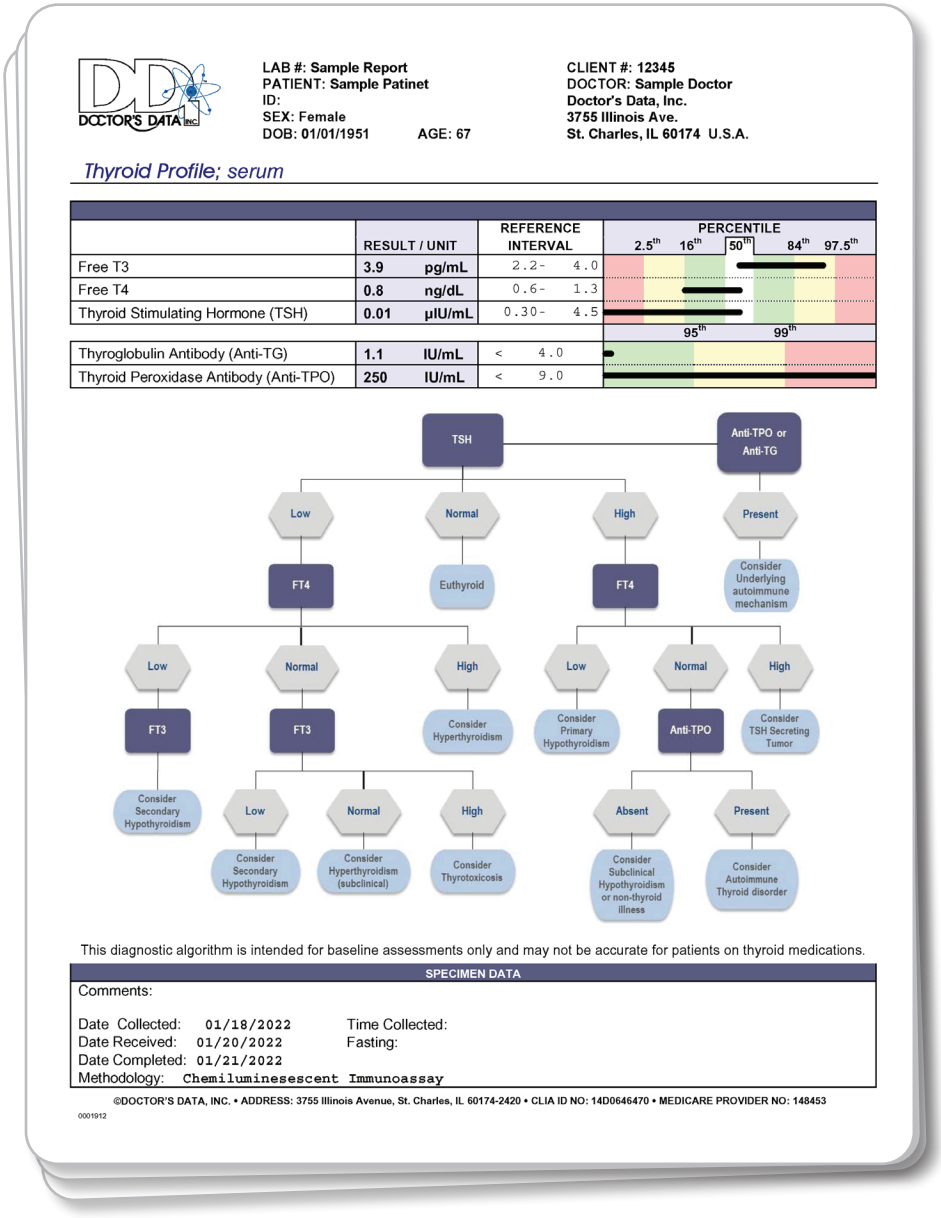
BLOOD

The analysis of thyroid hormones and auto-antibodies together may improve the accuracy diagnosis and clinical success. The American Thyroid Association estimates that approximately 20 million Americans have thyroid disease, and approximately 60% of those with thyroid disease are unaware of their condition. Many patients with thyroid disorders may remain undiagnosed in many patients with asymptomatic or non-specific clinical presentations. The recognition of auto-immunity as a leading cause of thyroid dysfunction has led to the evaluation of auto-antibodies in thyroid testing.

Measuring only thyroid stimulating hormone (TSH) may be misleading in a variety of circumstances, including the recent treatment of thyrotoxicosis, pituitary disease, non-thyroid illness, thyroid hormone resistance or rare, TSH-secreting tumors. Under these circumstances, and in many other cases, the evaluation of thyroid hormones and thyroid antibodies may clarify the diagnosis of thyroid conditions and improve clinical success.

This test is useful for

- Hypothyroid conditions
- Hyperthyroid conditions
- Autoimmune conditions
- Arrhythmia
- Infertility
- Cholesterol disorders
- Fatigue
- Pituitary disorders



LAB #: Sample Report
PATIENT: Sample Patinet
ID:
SEX: Female
DOB: 01/01/1951 AGE: 67

CLIENT #: 12345
DOCTOR: Sample Doctor
Doctor's Data, Inc.
3755 Illinois Ave.
St. Charles, IL 60174 U.S.A.

Thyroid Profile; serum

	RESULT / UNIT	REFERENCE INTERVAL	PERCENTILE 2.5th 16th 50th 84th 97.5th
Free T3	3.9 pg/mL	2.2 - 4.0	
Free T4	0.8 ng/dL	0.6 - 1.3	
Thyroid Stimulating Hormone (TSH)	0.01 µIU/mL	0.30 - 4.5	
			95th 99th
Thyroglobulin Antibody (Anti-TG)	1.1 IU/mL	< 4.0	
Thyroid Peroxidase Antibody (Anti-TPO)	250 IU/mL	< 9.0	

This diagnostic algorithm is intended for baseline assessments only and may not be accurate for patients on thyroid medications.

SPECIMEN DATA

Comments:

Date Collected: 01/18/2022 Time Collected:
Date Received: 01/20/2022 Fasting:
Date Completed: 01/21/2022
Methodology: Chemiluminesescent Immunoassay

0001912

OUR MISSION:

To research, develop and offer innovative specialty tests that help doctors identify health risks and improve outcomes for patients with chronic conditions.

To educate and support healthcare professionals.

To improve lives through science.

DOCTOR'S DATA INC.

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About Doctor's Data

Doctor's Data, Inc. has provided innovative specialty testing to healthcare practitioners around the world from our advanced, CLIA-licensed clinical laboratory since 1972.

A specialist and pioneer in essential and toxic elemental testing, the laboratory provides a wide array of functional testing to aid in decision making and better patient outcomes. Choose Doctor's Data to help you assess and treat heavy metal burden, nutritional deficiencies, gastrointestinal function, hormone status, cardiovascular risk, liver and metabolic abnormalities, and more.