US BioTek LABORATORIES · **PATIENT REPORT**
1620 Linden Av N Shoreline WA, 98133 • cservice@usbiotek.com • +1 206 365 1256

Clinical Laboratory Improvement Amendments

25092-0002

*** US BioTek** US BioTek. 16020 Linden Av N, Shoreline WA 98133

Lab ID 250920002
Patient ID PAT-100009
Ext ID 25092-0002

Test Patient

Sex: Female • 45yrs • 01-Jan-80

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01-Mar-25

EndoInsight

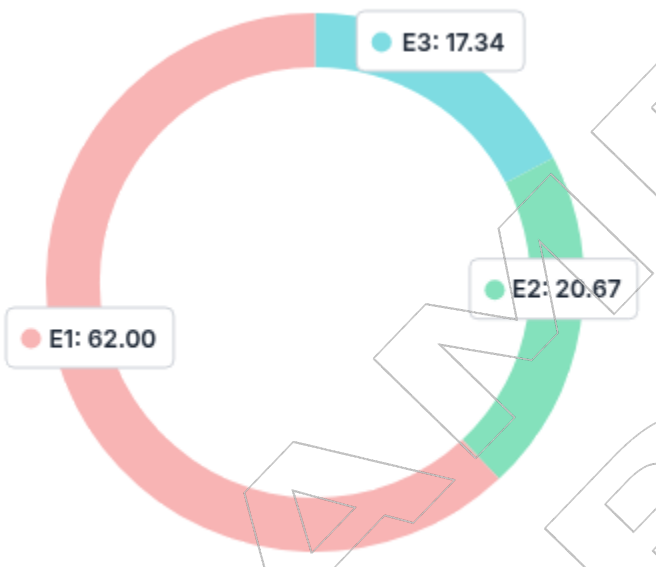
Specimen type - Urine, Dried

Collected
01-Mar-25 07.50am, 12.20pm, 04.40pm, 08.40pm

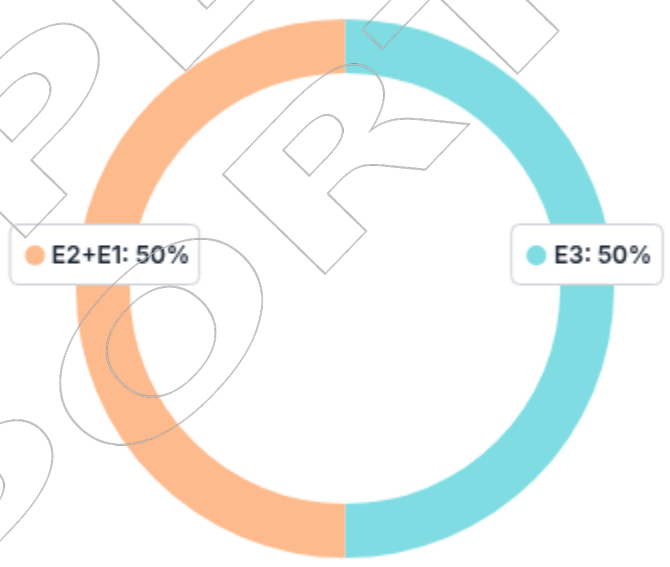
KEY STEROID HORMONES SUMMARY

SERVICE	RESULT	H/L	REFERENCE	UNITS
Estradiol (E2)	0.87		(0.60-1.80)	ug/gCR
Progesterone (serum equivalent)	0.04	L	(1.46-17.00)	ng/mL
Testosterone	3.81		(0.95-4.20)	ug/gCR

Estrogens Balance (as %)

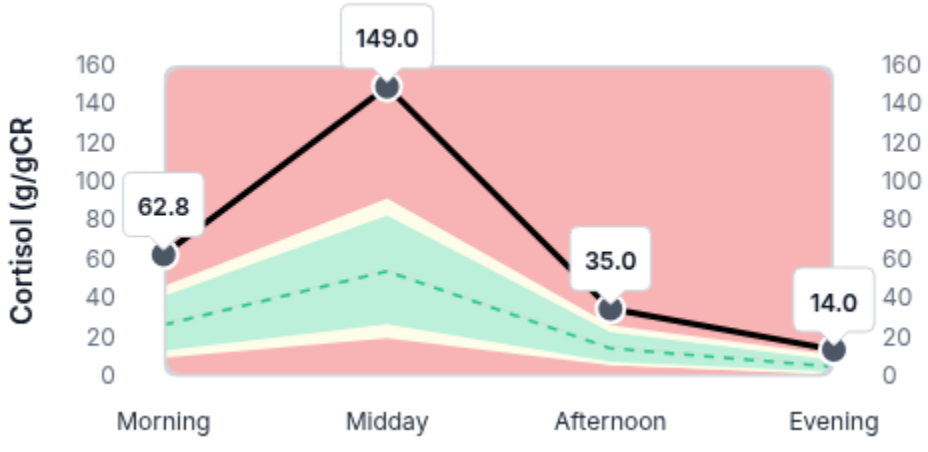


Healthy Estrogens Balance



Adrenal Function - Free Cortisol

SERVICE	RESULT	H/L	REFERENCE	UNITS
Cortisol, Morning	62.80	H	(10.00-45.00)	ug/gCR
Cortisol, Midday	149.00	H	(20.00-90.00)	ug/gCR
Cortisol, Afternoon	35.00	H	(6.00-25.00)	ug/gCR
Cortisol, Evening	14.00	H	(2.00-10.00)	ug/gCR



Adrenal Function - Key Markers

SERVICE	RESULT	H/L	REFERENCE	UNITS
Total Cortisol	36.32	H	(10.00-35.00)	ug/gCR
Tetrahydrocortisol (THF)	294		(160-560)	ug/gCR
DHEA Prod'n (DHEA+Androst+Etioch)	1789.37		(500.00-3000.00)	ug/gCR
Metabolised Cortisol (THF + THE)	1025		(700-1700)	ug/gCR

Lab Director: Jillian Harrington, PhD, HCLD (ABB). CLIA#99D2282774

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PRIMARY ESTROGENS

SERVICE	RESULT	H/L	REFERENCE	UNITS
Estradiol (E2)	0.87		(0.60-1.80)	ug/gCR
Estrone (E1)	2.61		(2.10-5.50)	ug/gCR
Estriol (E3)	0.73		(0.70-2.10)	ug/gCR
Estrogen Quotient - E3/[E2+E1]	0.21	L	(>0.25)	ratio

ESTROGEN METABOLISM - Phase 1

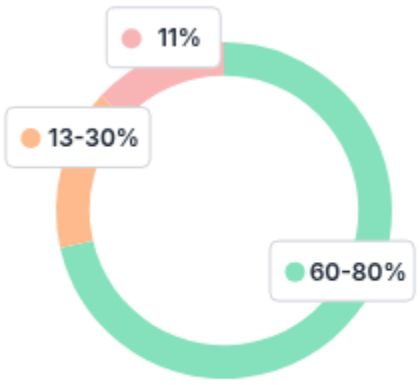
SERVICE	RESULT	H/L	REFERENCE	UNITS
2-OH Estradiol	1.30	H	(0.20-0.75)	ug/gCR
2-OH Estrone	3.25	H	(0.60-2.60)	ug/gCR
4-OH Estradiol	0.13		(0.08-0.20)	ug/gCR
4-OH Estrone	0.20		(0.17-0.47)	ug/gCR
16-OH Estrone	0.36		(0.30-1.10)	ug/gCR
2-OH(E1+E2)/16-OHE1	12.64	H	(1.20-5.60)	ratio

ESTROGEN METABOLISM - Phase 2

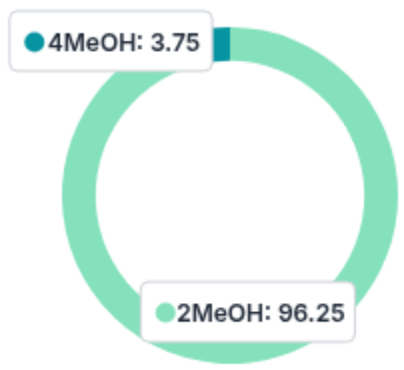
SERVICE	RESULT	H/L	REFERENCE	UNITS
2-MeOH Estradiol	0.12	H	(0.02-0.10)	ug/gCR
2-MeOH Estrone	0.77	H	(0.20-0.75)	ug/gCR
4-MeOH Estradiol	0.07	H	(<0.05)	ug/gCR
4-MeOH Estrone	0.03		(<0.05)	ug/gCR
2-MeOH E1/2-OH E1	0.24		(0.16-0.45)	ratio
4-MeOH E2/4-OH E2	0.54	H	(0.05-0.35)	ratio
4-MeOH E1/4-OH E1	0.15		(0.03-0.18)	ratio

Metabolism Ph1 % (Hydroxylation)

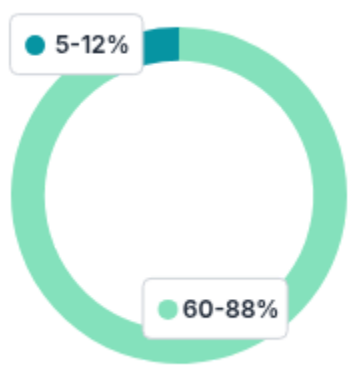
Healthy Ph1 % Metabolism



Metabolism Ph2 % (Methylation)



Healthy Ph2 % Metabolism



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ENDOCRINE DISRUPTORS

SERVICE	RESULT	H/L	REFERENCE	UNITS
Bisphenol A (BPA)	2.00		(<4.00)	ug/gCR
Polyfluoroalkyl Substances (PFAS)	0.40		(<0.70)	ug/gCR
Perfluorooctanoic Acid (PFOA)	0.00		(<0.10)	ug/gCR
Perfluorooctane Sulphonic Acid (PFOS)	0.00		(<0.60)	ug/gCR
Aluminium	1.90		(<14.00)	ug/gCR
Arsenic	32.00	H	(<26.50)	ug/gCR
Cadmium	0.50		(<0.60)	ug/gCR
Chromium	2.60		(<4.60)	ug/gCR
Lead	3.80		(<38.60)	ug/gCR
Mercury	29.0	H	(<17.9)	ug/gCR
Nickel	0.70		(<1.23)	ug/gCR

PROGESTERONE METABOLISM

SERVICE	RESULT	H/L	REFERENCE	UNITS
Pregnanediol	177	L	(400-1650)	ug/gCR
Allopregnanolone	12.66		(2.10-15.00)	ug/gCR
Allopregnanediol	45.00		(14.00-78.00)	ug/gCR
3a-Dihydroprogesterone	2.85	H	(0.50-2.50)	ug/gCR
20a-Dihydroprogesterone	5.63		(3.00-11.60)	ug/gCR
Deoxycorticosterone	2.10		(0.60-2.30)	ug/gCR
Corticosterone	10.43		(3.00-11.00)	ug/gCR
Pregnanediol/Estradiol	203	L	(500-1500)	ratio

PRIMARY ANDROGENS

SERVICE	RESULT	H/L	REFERENCE	UNITS
DHEA	91.37		(15.00-135.00)	ug/gCR
DHEA-S	68.0		(30.0-350.0)	ug/gCR
Androstenedione	9.70		(3.50-14.50)	ug/gCR
Androsterone	797		(220-980)	ug/gCR
Etiocholanolone	901		(300-1005)	ug/gCR
Testosterone	3.81		(0.95-4.20)	ug/gCR
Epi-Testosterone	7.28	H	(1.90-4.80)	ug/gCR
DiHydroxyTestosterone (DHT)	1.65	H	(0.25-1.60)	ug/gCR
5a-Androstanediol	5.99		(2.50-13.50)	ug/gCR

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KEY ANDROGEN RATIOS

SERVICE	RESULT	H/L	REFERENCE	UNITS
DHEA Prod'n (DHEA+Androst+Etioch)	1789.37		(500.00-3000.00)	ug/gCR
5a-Reductase Activity (Androst/Etioch)	0.88		(0.60-2.20)	ratio
Testosterone/Epi-Testosterone	0.52		(0.40-5.50)	ratio

Nutritional Organic Acids

SERVICE	RESULT	H/L	REFERENCE	UNITS
Xanthurenic Acid	3.10	H	(<0.96)	mmol/molCR
b-Hydroxyisovaleric Acid	4.9		(<29.0)	mmol/molCR
Methylmalonic Acid	2.8	H	(<1.9)	mmol/molCR
Homovanillic Acid (HVA)	3.1		(0.1-5.3)	mmol/molCR
Vanillylmandelic Acid (VMA)	2.7		(0.4-3.6)	mmol/molCR
Kynurenic Acid	8.3	H	(<2.2)	mmol/molCR
Quinolinic Acid	9.9	H	(<9.1)	mmol/molCR

Other Organic Acids

SERVICE	RESULT	H/L	REFERENCE	UNITS
8-OH-deoxyguanosine	2.10		(<2.70)	mmol/molCR
Pyroglutamic Acid	10.50		(4.50-33.00)	mmol/molCR
Indoleacetic Acid	3.80		(<11.00)	mmol/molCR

URINE CREATININES

SERVICE	RESULT	H/L	REFERENCE	UNITS
Creatinine, Urine Pooled	1.20		(0.30-2.20)	mg/ml
Creatinine, Urine Morning	0.70		(0.30-2.20)	mg/ml
Creatinine, Urine Midday	0.60		(0.30-2.20)	mg/ml
Creatinine, Urine Afternoon	1.10		(0.30-2.20)	mg/ml
Creatinine, Urine Evening	1.70		(0.30-2.20)	mg/ml

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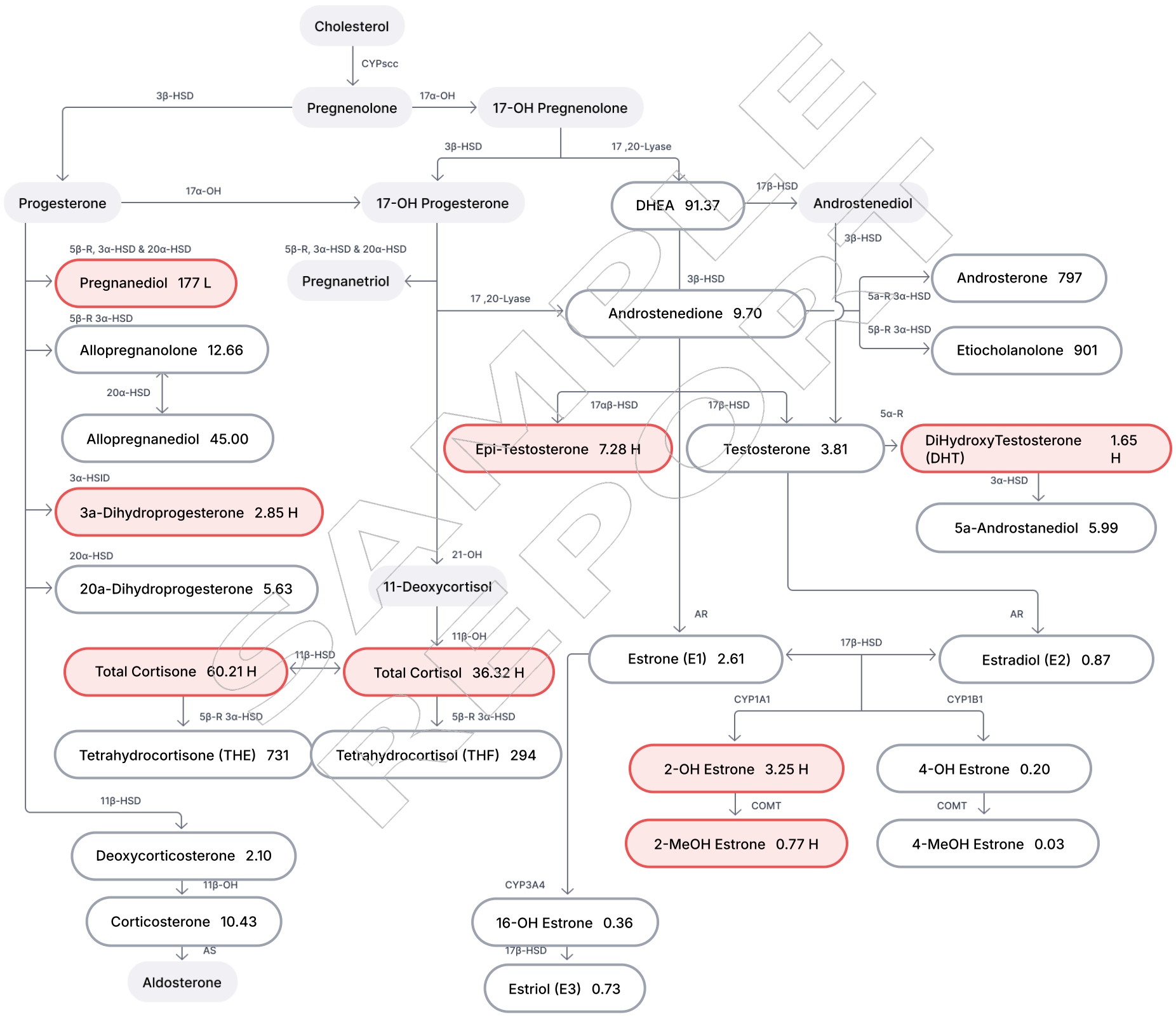

Legend Hormone not tested | Within range | Out of range | L = Low, LL = Critically Low | H = High , HH = Critically High

Enzyme Abbreviations

5α-R	5a-Reductase	**3α-HSD**	3α-Hydroxysteroid dehydrogenase	**AR**	Aromatase
5β-R	5β-Reductase	**3β-HSD**	3β-Hydroxysteroid dehydrogenase	**AS**	Aldosterone Synthase
11β-oH	11β-Hydroxylase	**11β-HSD**	11β Hydroxysteroid dehydrogenase	**CYP**	Cytochrome p450 (scc, 1A1, 1B1 & 3A4)
17α-OH	17α-Hydroxylase	**17α-HSD**	17α-Hydroxysteroid dehydrogenase	**COMT**	Catechol-O-Methyl-Transferase
17,20-Lyase	Same enzyme as 17α-OH	**17β-HSD**	17β-Hydroxysteroid dehydrogenase		
21-OH	21-Hydroxylase	**20α-HSD**	20α-Hydroxysteroid dehydrogenase		

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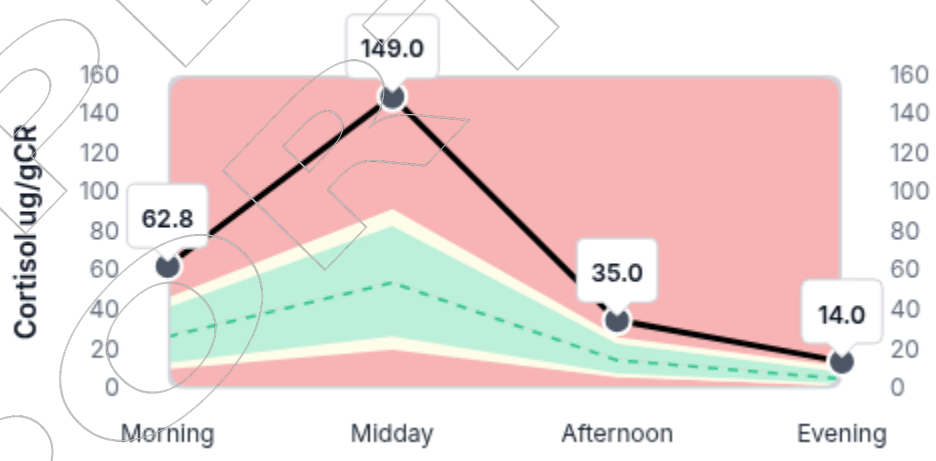
URINARY GLUCOCORTICOIDS

SERVICE	RESULT	H/L	REFERENCE	UNITS
Total Cortisol	36.32	H	(10.00-35.00)	ug/gCR
Total Cortisone	60.21	H	(23.00-53.00)	ug/gCR
Total Cortisol/Cortisone	0.60		(0.20-0.70)	ratio
Tetrahydrocortisol (THF)	294		(160-560)	ug/gCR
Tetrahydrocortisone (THE)	731		(400-1450)	ug/gCR
Metabolised Cortisol (THF + THE)	1025		(700-1700)	ug/gCR
11b-HSD-Index (THF/THE)	0.40	L	(0.59-1.42)	ug/gCR

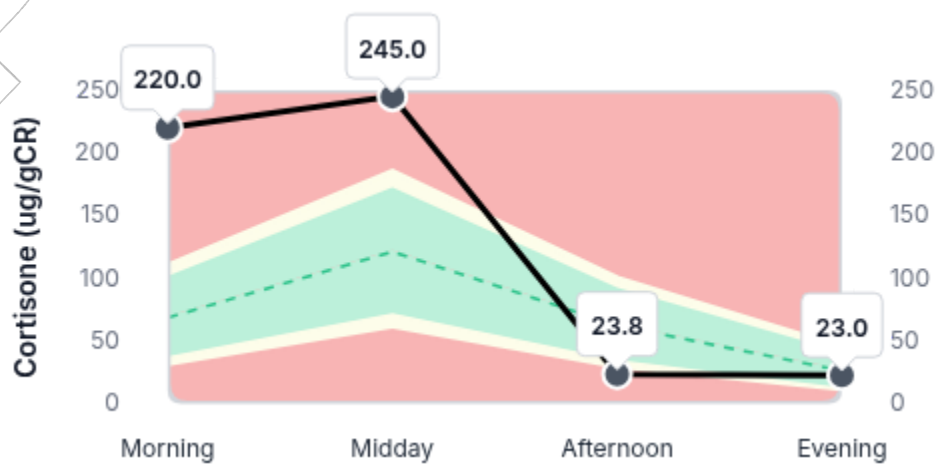
Free Cortisols

SERVICE	RESULT	H/L	REFERENCE	UNITS
Cortisol, Morning	62.80	H	(10.00-45.00)	ug/gCR
Cortisol, Midday	149.00	H	(20.00-90.00)	ug/gCR
Cortisol, Afternoon	35.00	H	(6.00-25.00)	ug/gCR
Cortisol, Evening	14.00	H	(2.00-10.00)	ug/gCR



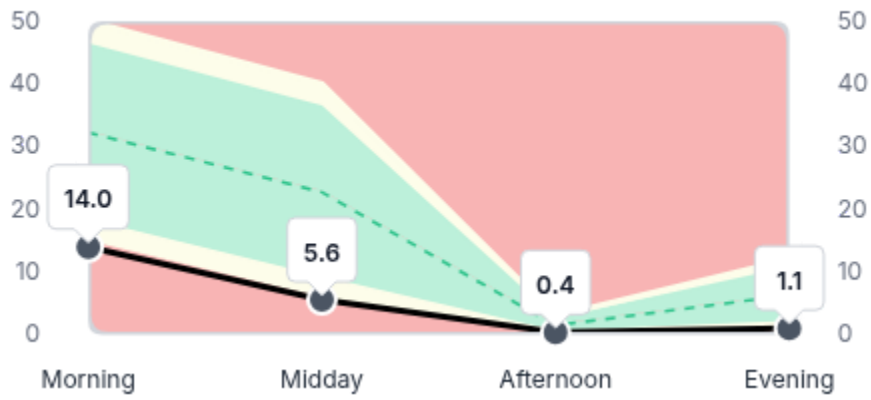
Free Cortisones

SERVICE	RESULT	H/L	REFERENCE	UNITS
Cortisone, Morning	220.00	H	(30.00-110.00)	ug/gCR
Cortisone, Midday	245.00	H	(60.00-185.00)	ug/gCR
Cortisone, Afternoon	23.80	L	(28.00-100.00)	ug/gCR
Cortisone, Evening	23.00		(10.00-45.00)	ug/gCR



URINARY MELATONINS

SERVICE	RESULT	H/L	REFERENCE	UNITS
Melatonin, Morning	14.00	L	(15.00-50.00)	ug/gCR
Melatonin, Midday	5.60	L	(6.00-40.00)	ug/gCR
Melatonin, Afternoon	0.40	L	(0.50-3.00)	ug/gCR
Melatonin, Evening	1.10	L	(1.20-12.00)	ug/gCR



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Symptom Score

0. NONE	1. MILD	2. MODERATE	3. SEVERE
Rapid aging	Elevated triglycerides	Decreased flexibility	Cold body temperature
Headaches	Sensitivity to chemicals	Decreased libido	Decreased stamina
Rapid heartbeat	Nails breaking or brittle	Decreased urine flow	Bone loss
Depressed	Low blood sugar	Swelling or puffy eyes/face	Developmental delays
Decreased erections	Apathy	Oily skin or hair	Neck or back pain
High blood pressure	Anxious	Panic attacks	Slow pulse rate
Burned out feeling	Ringing in ears	Decreased muscle size	Autism Spectrum Disorder
Hair dry or brittle	Increased urinary urge	Sugar craving	Difficulty sleeping
Eating disorders	Hearing loss	Stress	Goiter
Weight gain - Waist	Acne	Thinning skin	Irritable
ADD/ADHD	Hot flashes	Mania	Prostate problems
	Decreased sweating	Infertility problems	
	Decreased mental sharpness	Nervous	
	Morning fatigue	Mental fatigue	
	Weight gain - Breasts/hips	Heart palpitations	
	High cholesterol	Low blood pressure	
	Constipation	Allergies	
	OCD	Hoarseness	
	Addictive behaviours	Night sweats	
	Dizzy spells	Evening fatigue	

Symptom Categories

Estrogen & Progesterone Deficiency	66.67%	
Estrogen Dominance/Progesterone Deficiency	66.67%	
Low Androgens	52.22%	
High Androgens	55.56%	
Low Cortisol	58.73%	
High Cortisol	47.37%	
Hypometabolism	50.00%	
Metabolic Syndrome	33.33%	

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Urinary Estrogens Comment

ESTROGEN QUOTIENT LOW:

This ratio reflects the relative levels of estriol compared to other estrogens, indicating estrogen metabolism.

A low ratio suggests a dominance of estrone and estradiol over estriol, which may be linked to estrogen dominance, leading to symptoms such as mood swings, heavy periods, and fibroids. Consider further investigations such as serum TFT's.

2-HYDROXY-ESTRADIOL ELEVATED:

2-OH Estradiol is a less potent, detoxified metabolite of estradiol. Elevated 2-OH estradiol levels are considered protective, indicating effective estrogen detoxification. This may reduce symptoms of estrogen dominance and lower the risk of endometrial or breast cancer.

2-HYDROXY-ESTRONE ELEVATED:

2-OH Estrone is a detoxified, less potent metabolite of estrone that reduces estrogenic activity. High 2-OH estrone levels suggest a well-functioning detoxification pathway, which can help lower the risk of estrogen-dependent conditions, including endometrial and breast cancers.

2-HYDROXY-ESTROGENS/16-HYDROXY-ESTROGENS RATIO ELEVATED:

This ratio compares protective 2-hydroxy metabolites to the more carcinogenic 16α-hydroxy metabolites. A higher ratio reflects a protective estrogen metabolism, reducing the risk of estrogen-sensitive cancers and associated symptoms like breast tenderness and heavy periods.

2-METHOXY-ESTRADIOL ELEVATED:

2-MeO Estradiol is a methylated metabolite of estradiol that has protective effects against estrogen-induced carcinogenesis. High levels indicate efficient methylation and detoxification, protecting against estrogen-induced DNA damage, and lowering the risk of hormone-sensitive cancers.

2-METHOXY-ESTRONE ELEVATED:

2-MeO Estrone is a methylated form of estrone that helps reduce estrogenic effects and protects against DNA damage. High levels reflect efficient detoxification, lowering the potential for estrogen-dependent cancers and improving hormonal balance.

4-METHOXY-ESTRADIOL ELEVATED:

4-MeO Estradiol is a methylated form of 4-OH estradiol, which reduces its carcinogenic potential. High levels suggest efficient detoxification, helping to protect against the genotoxic effects of estradiol and reducing the risk of estrogen-related cancers.

4-METHOXY-ESTRADIOL/4-HYDROXY-ESTRADIOL RATIO ELEVATED:

This ratio compares the methylated 4-OH estradiol to its more harmful form, reflecting the balance between detoxified and genotoxic metabolites. High ratios indicate efficient detoxification of estradiol, reducing the likelihood of oxidative stress and DNA damage, and protecting against estrogen-dependent cancers.

Progesterone Metabolites Comment

PREGNANEDIOL LOW:

Pregnanediol is a metabolite of progesterone and is used to assess the body’s progesterone status.

Low pregnanediol may indicate inadequate progesterone production, often seen in luteal phase defects or anovulation. Symptoms include irregular cycles, infertility, and mood disturbances.

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PREGNANEDIOL/ESTRADIOL RATIO LOW:

The Pgdiol/E2 ratio compares progesterone metabolism (via pregnanediol) to estradiol metabolism, reflecting estrogen-progesterone balance. A low ratio suggests an estrogen-dominant state, which can contribute to symptoms like heavy periods, fibroids, PMS, and an increased risk of endometrial cancer.

3α-DIHYDROPROGESTERONE ELEVATED:

3α-Dihydroprogesterone is a metabolite of progesterone with anxiolytic and calming properties. Elevated 3α-dihydroprogesterone levels may be seen during pregnancy or in cases of progesterone therapy, contributing to fatigue, bloating, and mood swings.

Urinary Androgen Comment

EPI-TESTOSTERONE ELEVATED:

Epi-testosterone is a testosterone isomer often measured alongside testosterone to assess androgenic activity. Elevated epi-testosterone may indicate altered testosterone metabolism or conditions such as PCOS, adrenal disorders, or steroid use. Symptoms may include acne, hirsutism, and irregular periods.

DIHYDROTESTOSTERONE (DHT) ELEVATED:

5α-DHT is a potent androgen derived from testosterone, involved in male-pattern hair growth and other androgenic effects. Elevated 5α-DHT levels are often seen in conditions like PCOS or androgen excess, contributing to symptoms such as acne, hirsutism, and hair loss.

Urinary Glucocorticoid Comment

URINE CORTISOLS INTERPRETATION:

Elevated urinary cortisol levels at multiple time points throughout the day suggest hypercortisolism, reflecting chronic stress, adrenal hyperactivity, or conditions such as Cushing's syndrome or pseudo-Cushing's states (e.g., due to obesity, alcohol use, or severe stress). This state results in prolonged activation of the hypothalamic-pituitary-adrenal (HPA) axis, contributing to symptoms like anxiety, sleep disturbances, fatigue, abdominal weight gain, insulin resistance, hypertension, and immune suppression. Chronic hypercortisolism may also lead to muscle catabolism, bone loss, and impaired wound healing.

Management strategies include addressing underlying causes, such as evaluating for Cushing's syndrome through confirmatory tests (e.g., A salivary 4 point cortisol including a 12am sample). Nutritional support can help modulate cortisol levels, including adaptogenic herbs like ashwagandha and rhodiola, magnesium, vitamin C, and B vitamins. Anti-inflammatory and low-glycemic diets are beneficial, while minimising stimulants like caffeine. Stress management techniques and consistent sleep-wake cycles are important interventions.

Urinary Melatonin Comment

URINE MELATONINS INTERPRETATION:

Consistently low or low-normal melatonin levels across all time points suggest potential circadian rhythm disruption or poor pineal gland function. This can be indicative of insufficient sleep quality or quantity, excessive exposure to artificial light (especially blue light from screens), or stress-related dysregulation. Symptoms may include difficulty falling asleep, poor sleep quality, or insomnia. Treatment strategies include improving sleep hygiene, minimising light exposure before bedtime, and promoting relaxation through dietary support such as magnesium or melatonin supplementation in the evening. Lifestyle changes such as reducing caffeine intake and managing stress levels are also beneficial. If melatonin supplementation is warranted, daily doses of 0.5 mg to 5 mg with 2mg being the most common dose shows similar effectiveness, although sleep onset may be quicker at the higher dose.

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Methodology

Liquid Chromatography-Mass Spectrometry (LC-MS/MS/MS), Inductively Coupled Plasma Mass Spectrometry (ICP-MS)

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