



Hormone Testing

Selecting the Right Profile for Your Complex Patient

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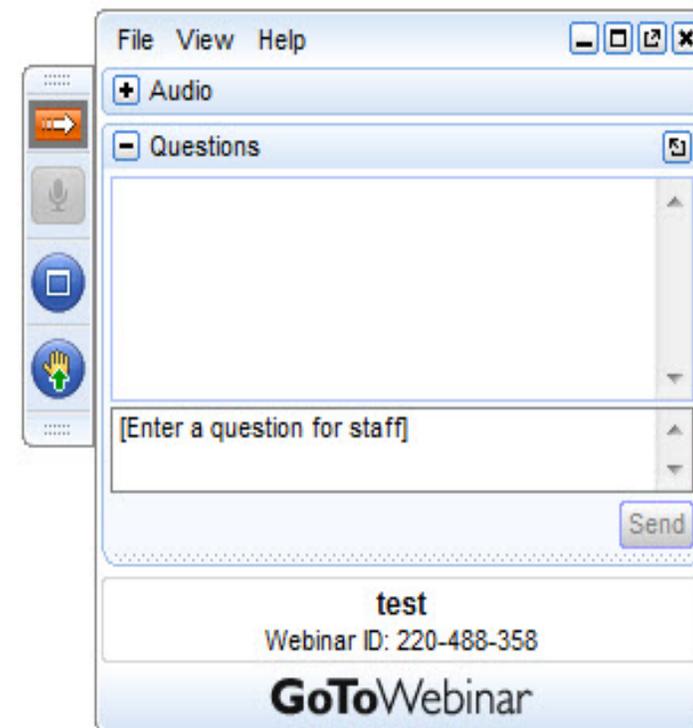
Presenter



Technical Issues & Clinical Questions

Please type any technical issue or clinical question into either the “Chat” or “Questions” boxes, making sure to send them to “Organizer” at any time during the webinar.

We will be compiling your clinical questions and answering as many as we can the final 15 minutes of the webinar.



DISCLAIMER: Please note that any and all emails provided may be used for follow up correspondence and/or for further communication.

Need More Resources?

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WWW.GDX.NET
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LIVE **GDX** – Previous webinar recordings
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The screenshot shows the Genova Diagnostics website's Medical Education page. The navigation bar includes social media icons (Twitter, LinkedIn, YouTube, Facebook), a menu with 'Payments', 'About', 'Contact', 'Search', 'myGDX', and 'Region', and main navigation links for 'HOME', 'CLINICIANS', and 'PATIENTS'. The breadcrumb trail reads 'Home / Clinicians / Medical Education'. The main heading is 'Medical Education', followed by a paragraph describing Genova Diagnostics' commitment to professional standards and educational support. Below this, six resource categories are listed: Medical Conferences, Webinars (circled in red), LearnGDX, Educational Modules, Bookstore, and Consultations. Each category includes a brief description and a 'More' link. At the bottom, there are logos for GLfx, NutrEval, and ION, along with a quote: 'Providing comprehensive and innovative clinical laboratory services for the prevention, diagnosis and treatment of complex chronic disease...' attributed to Genova Diagnostics.



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Objectives:

Following this presentation, participants will be able to:

- Distinguish the pros and cons of serum, salivary, and urinary hormone testing options
- Recognize which tests may best serve the specific needs of the patient
- Utilize testing in the context of case studies

OBJECTIVE





*“It ain’t what you don’t know that gets you into trouble.
It’s what you know for sure that just ain’t so.”*

-Mark Twain

-Josh Billings





What are the Symptoms of Hormone Imbalance?

- Weight gain
- Anxiety
- Low libido
- Brain fog
- Vaginal dryness
- Hair loss
- Hot flashes
- Sleep disturbances
- Mood swings
- Breast tenderness.....





Hormones are about finding a balance...

- The list of symptoms goes on and on, testing provides greater insight
- The key is in reaching a state of balance for each individual patient
- Start slow, increase in small increments
- Monitor the clinical picture



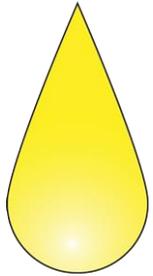
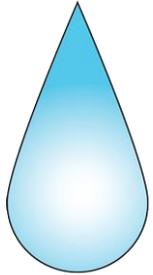
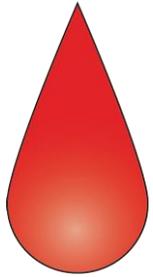


How is Specimen Type Determined?

- The clinical question being asked; what you need to learn
- Understanding the advantages and disadvantages of each specimen option
- The therapeutic modalities being used

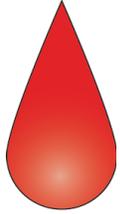


Clinical Considerations & Sample Types

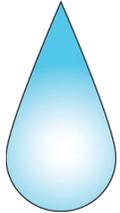




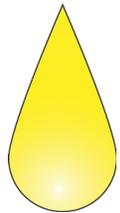
Hormone Sample Types



SERUM – Reflects circulating hormones, including bound (reserve), and unbound (active)



SALIVA – Reflects unbound, free, and active hormone



URINE – Reflects combination of both excess endocrine production and peripheral production of hormones and metabolites



Metaphorically speaking, a guy walks into a bank...

- **Blood** is like asking to see all of his holdings: IRA, stocks, bonds, cash (bound and unbound)
- **Saliva** is like asking how much cash he's got in his account (unbound, available)
- **Urine** is like asking for all of his receipts (metabolites) so he can add them up and figure out where he's been spending his money.
 - *Metabolites allow for greater understanding of estrogen detoxification*





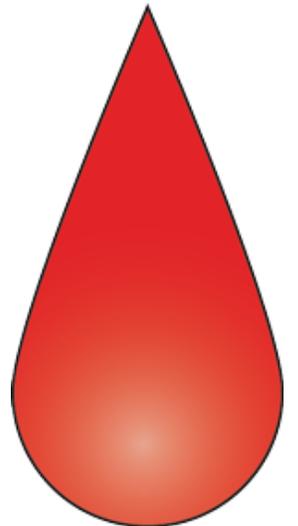
Serum Testing





Serum Testing

- Reflects circulating hormones, including bound (reserve) and un-bound (active)
- The most studied matrix for hormone assessment
- Transdermal and transvaginal levels may be under-represented
- Measures Sex Hormone Binding Protein Globulin (SHBG)
- Serum Testing and Hormone Replacement Therapy (HRT)
 - Generally acceptable matrix for patients not on HRT
 - May be utilized in patients on oral/pellet HRT?





Menopause: The Journal of The North American Menopause Society
Vol. 20, No. 11, pp. 1169-1175
DOI: 10.1097/gme.0b013e31828d39a2
© 2013 by The North American Menopause Society

Percutaneous progesterone delivery via cream or gel application in postmenopausal women: a randomized cross-over study of progesterone levels in serum, whole blood, saliva, and capillary blood

Reliance on serum levels of progesterone for monitoring topical dose could lead to underestimation of tissue levels...

progesterone showed a peak at 1 and 6 hours after cream and gel application, respectively, and C_{\max} was comparable with cream and gel. Saliva $AUC_{0-24\text{ h}}$ was substantially higher than the corresponding area under the curve for serum or whole blood but did not differ significantly by delivery method (39.02 and 58.37 ng h mL⁻¹, $P = 0.69$). In capillary blood, C_{\max} was reached at the same time (8 h) and was similar with both formulations; $AUC_{0-24\text{ h}}$ was also similar with both formulations (1,056 ng h mL⁻¹ for cream and 999 ng h mL⁻¹ for gel) but was dramatically higher than the corresponding areas under the curve for venous serum and whole blood.

Conclusions: After application of topical progesterone, saliva and capillary blood levels are approximately 10-fold and 100-fold greater, respectively, than those seen in serum or whole blood. High capillary blood and saliva levels indicate high absorption and transport of progesterone to tissues. Reliance on serum levels of progesterone for monitoring topical dose could lead to underestimation of tissue levels and consequent overdose.



When is Serum Testing Most Useful?

- Circulating hormones, bound and unbound fractions of the hormones
- Single sample
- Greater breadth of literature
- Some hormones assessed through blood only
 - Sex hormone Binding Globulin (SHBG)
 - Thyroid hormones
- Estrogen metabolites
 - 2-Hydroxyestrone
 - 16- α -Hydroxyestrone
- Can be used to establish baseline levels pre-HRT
- Special precautions
 - Transdermal HRT is under-represented in blood

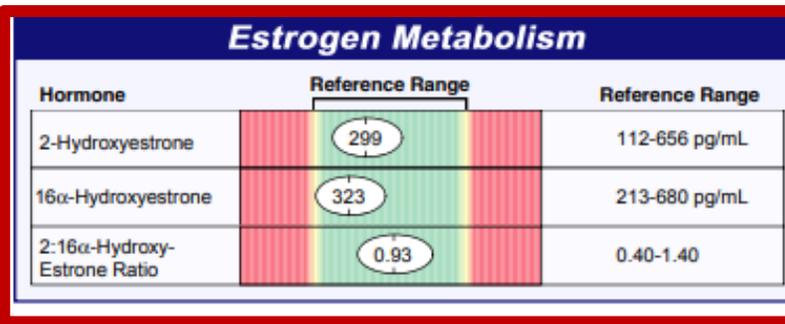
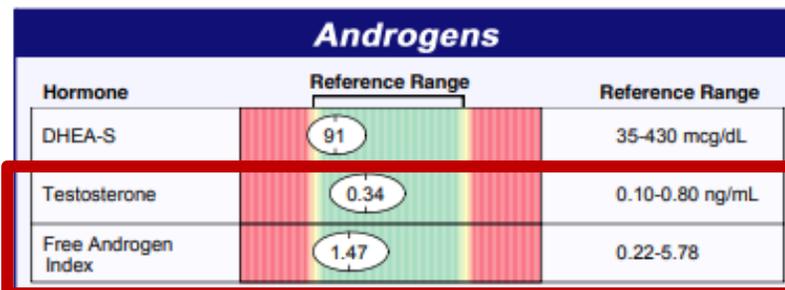
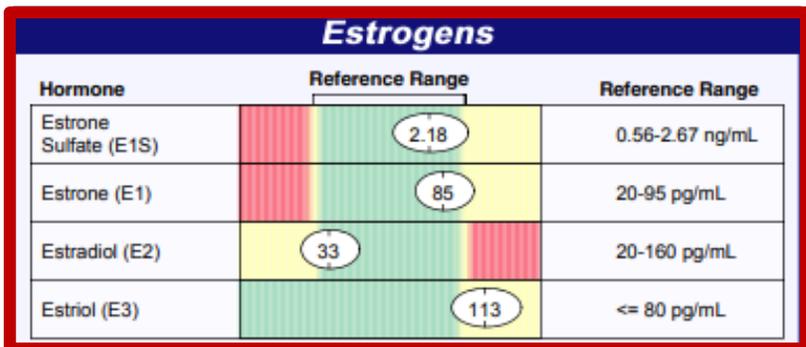
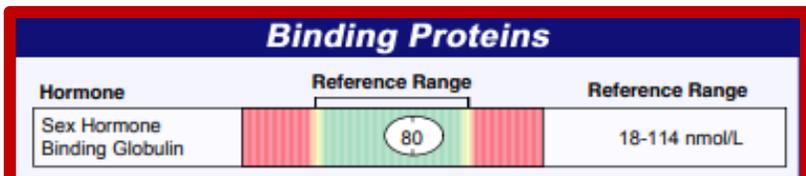
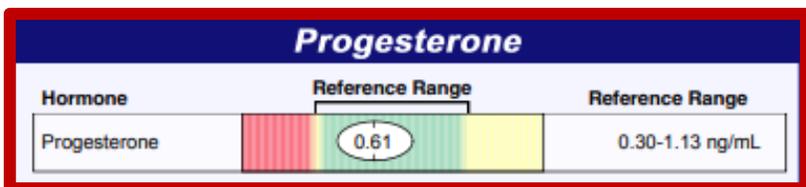
Patient: **SAMPLE**

PATIENT

Age:

Sex:

MRN:





Urine Testing





Urine Testing

- Urine test (FMV or 24 Hour) – provides comprehensive evaluation of hormone metabolism
 - 24-Hour: Preferred for patients on any hormone replacement therapy (HRT)
 - FMV: May be used for patients not on HRT
 - Unbound hormones and circulating metabolites
 - Assesses hormone metabolism
 - Assesses steroidal enzyme activity
 - “Adding up receipts” through metabolites, provides data regarding risk



Can you use Urine Testing to Monitor HRT?

- This is currently a hotly debated topic
- NOTE: Urine is a reflection of blood (because it is a filtrate of blood)
 - Many clinicians assert that urine testing can be used to monitor *orally* administered hormones
- What about *topical* hormone replacement therapy?
 - Many clinicians indicate that one cannot use urine testing to monitor HRT
 - Research has shown that topical progesterone is underrepresented in the blood, therefore it would likely be underrepresented in urine as well
 - Some clinicians have asserted that topical estrogen does show up in the urine
 - This has not been validated in the literature
- Genova offers serum, saliva, and urine testing to accommodate varying opinions regarding best practices



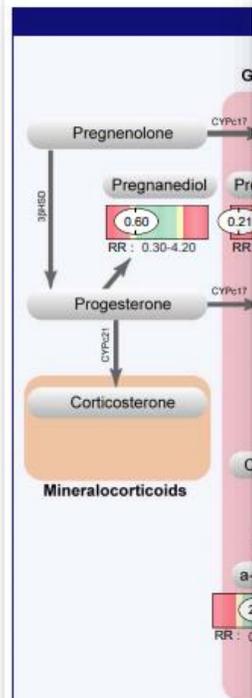
Considerations for Urine Testing of Hormones

- Urine hormone levels represent excreted levels
- Therefore, if the urine levels are robust, there is a concern around tissue saturation
- If the levels are moderate or low, interpretation may be more difficult
 - Lower levels (less excretion in urine) may mean lower circulating levels or better tissue utilization of the hormone, thus less excreted
- The levels of metabolites provide insight into detoxification pathways and risk assessment

Patient: **SAMPLE PATIENT**

DOB:
Sex:
MRN:

Patient: SAMPLE PATIENT



ENZYMATIC STEPS:
 3βHSD = 3beta-Hydroxysteroid dehydrogenase
 5α = 5alpha-Reductase
 5β = 5beta-Reductase
 CYP11β1 = 11beta-Hydroxylase
 11βHSD = 11beta-Hydroxysteroid dehydrogenase
 17βHSD = 17beta-Hydroxysteroid dehydrogenase
 17,20 Lyase = 17,20 Desmolase
 CYPc17 = 17alpha-Hydroxylase
 CYP19 = Aromatase
 CYP21 = 21-Hydroxylase

ESTROGEN METABOLISM
 1A1 = Cytochrome p450 1A1 (CYP1A1)
 3A4 = Cytochrome p450 3A4 (CYP3A4)
 1B1 = Cytochrome p450 1B1 (CYP1B1)
 COMT = Catechol-O-Methyltransferase

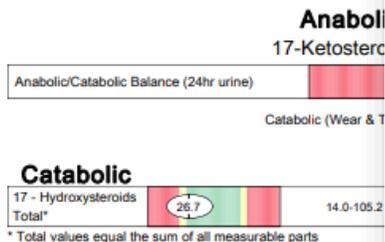
KEY *OH = Hydroxy
 *MeO = Methoxy

Patient: SAMPLE PATIENT

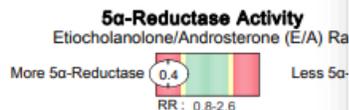
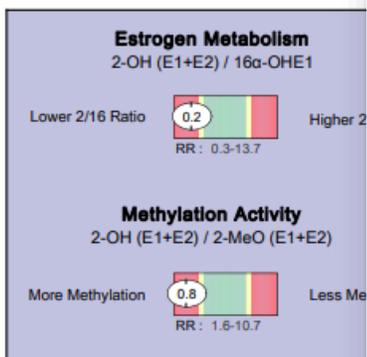
Patient: **SAMPLE PATIENT**

DOB:
Sex:
MRN:

Methodology: GC-MS and LC-MS/MS; Specimen: 24 hour urine; Results normalized to creatinine



Enzymatic Activity



Pregnanediol (24hr urine)

17-Ketosteroids

- DHEA (24hr urine)
 - Androsterone (24hr urine)
 - Etiocholanolone (24hr urine)
 - 11-Keto-androsterone (24hr urine)
 - 11-Keto-etiocholanolone (24hr urine)
 - 11-Hydroxy-androsterone (24hr urine)
 - 11-Hydroxy-etiocholanolone (24hr urine)
 - 17-Ketosteroids, Total* (24hr urine)
- * Total values equal the sum of all measurable parts
- Testosterone (24hr urine)
 - Androstenediol (24hr urine)

17-Hydroxysteroids

- Pregnanetriol (24hr urine)
 - allo-Tetrahydrocortisol, a-THF (24hr urine)
 - Tetrahydrodeoxycortisol, THS (24hr urine)
 - Tetrahydrocortisone, THE (24hr urine)
 - Tetrahydrocortisol, THF (24hr urine)
 - 17-Hydroxysteroids, Total* (24hr urine)
- * Total values equal the sum of all measurable parts

Patient: SAMPLE PATIENT

ID:

Estrogens



* Premenopause (luteal) reference range shown

	Reference Ranges
Premenopause	2.0-26.2 mcg/g Creat.
Menopause	1.1-26.2 mcg/g Creat.
Male	1.6-8.6 mcg/g Creat.



* Premenopause (luteal) reference range shown

	Reference Ranges
Premenopause	0.6-11.2 mcg/g Creat.
Menopause	0.6-15.4 mcg/g Creat.
Male	0.8-4.3 mcg/g Creat.



* Premenopause (luteal) reference range shown

	Reference Ranges
Premenopause	0.6-19.9 mcg/g Creat.
Menopause	0.7-30.8 mcg/g Creat.
Male	0.3-5.1 mcg/g Creat.

Estrogen Metabolites



* Premenopause (luteal) reference range shown

	Reference Ranges
Premenopause	1.3-36.3 mcg/g Creat.
Menopause	0.9-43.8 mcg/g Creat.
Male	0.7-12.5 mcg/g Creat.



* Premenopause (luteal) reference range shown

	Reference Ranges
Premenopause	0.5-8.9 mcg/g Creat.
Menopause	0.4-7.7 mcg/g Creat.
Male	<=2.0 mcg/g Creat.



* Premenopause (luteal) reference range shown

	Reference Ranges
Premenopause	<=5.9 mcg/g Creat.
Menopause	<=8.8 mcg/g Creat.
Male	<=1.6 mcg/g Creat.



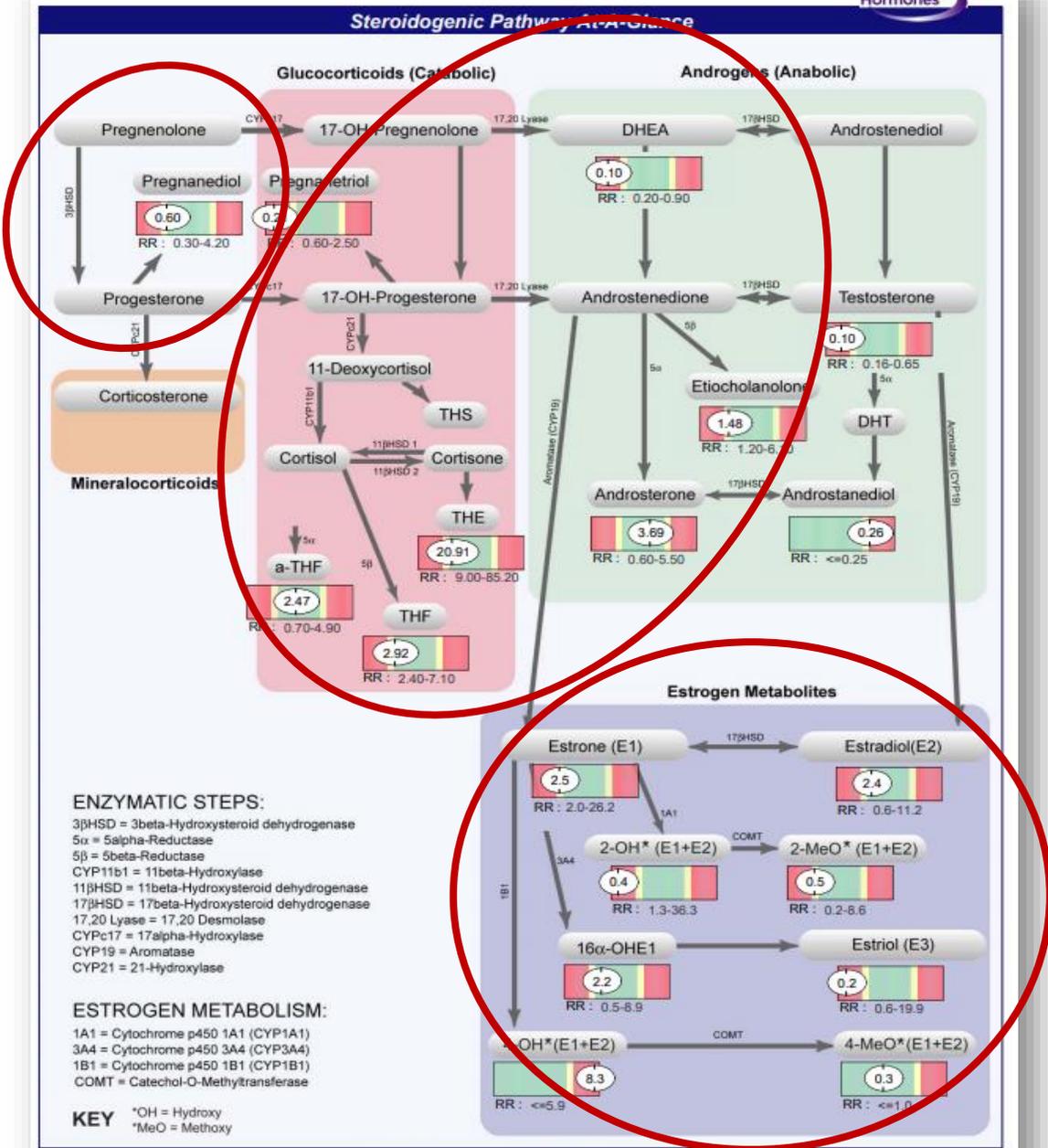
* Premenopause (luteal) reference range shown

	Reference Ranges
Premenopause	0.2-8.6 mcg/g Creat.
Menopause	0.3-5.9 mcg/g Creat.
Male	0.2-2.5 mcg/g Creat.



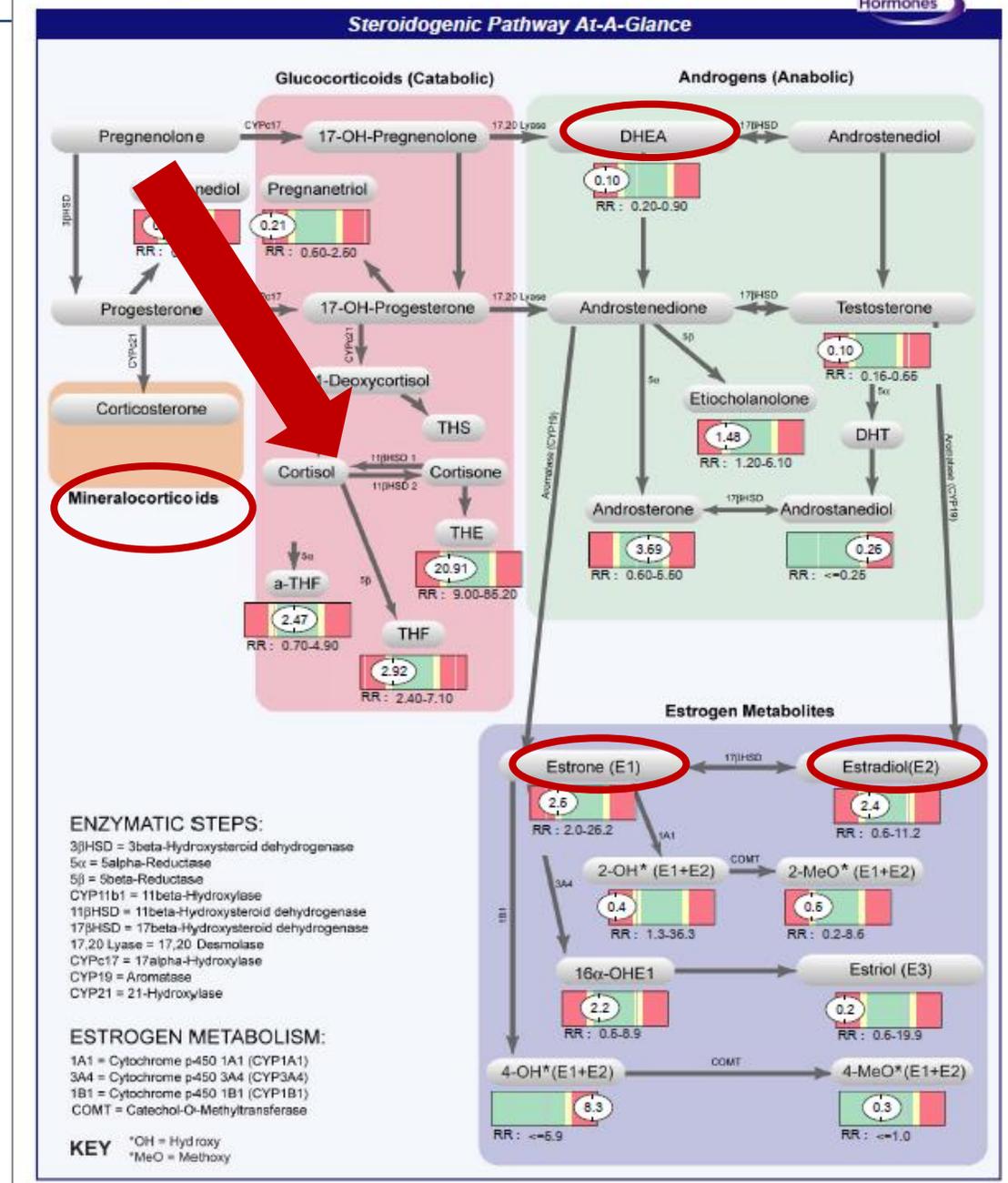
* Premenopause (luteal) reference range shown

	Reference Ranges
Premenopause	<=1.0 mcg/g Creat.
Menopause	<=1.0 mcg/g Creat.



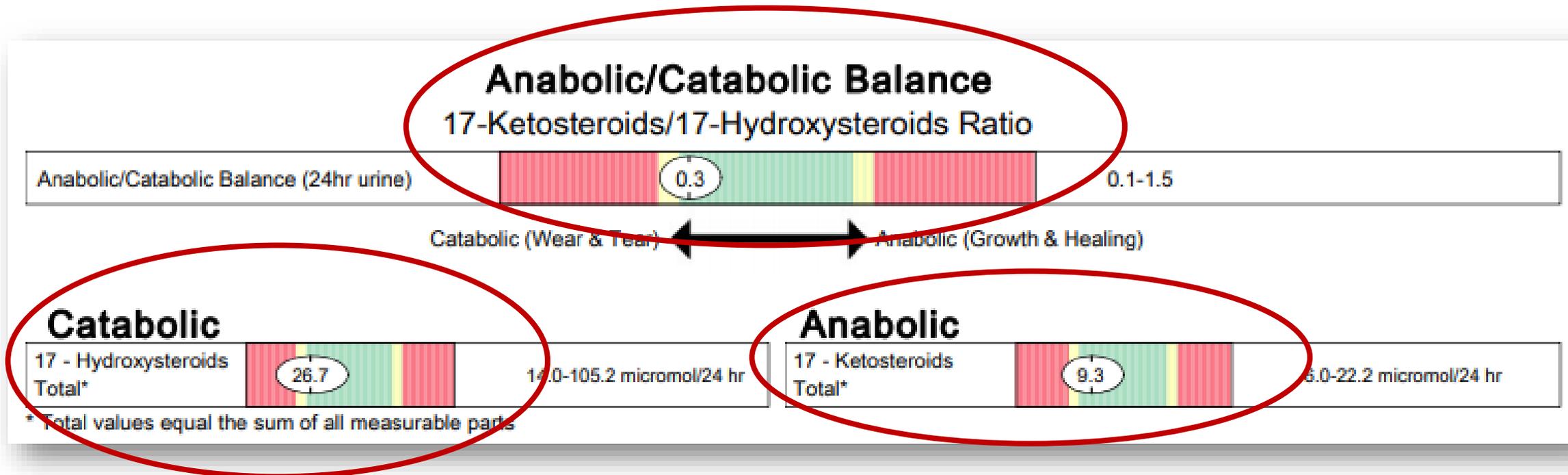
HPA Axis Imbalance

- Stress alters HPA axis balance, thereby decreasing production of androgens and estrogens
- Increased cortisol production
 - May impact thyroid and insulin levels
- Stress alters HPA axis, leading to an increase in mineralocorticoids
 - Stimulation of the renin-angiotensin-aldosterone system (RAS) leads to tachycardia and elevated blood pressure





Anabolic/Catabolic Balance



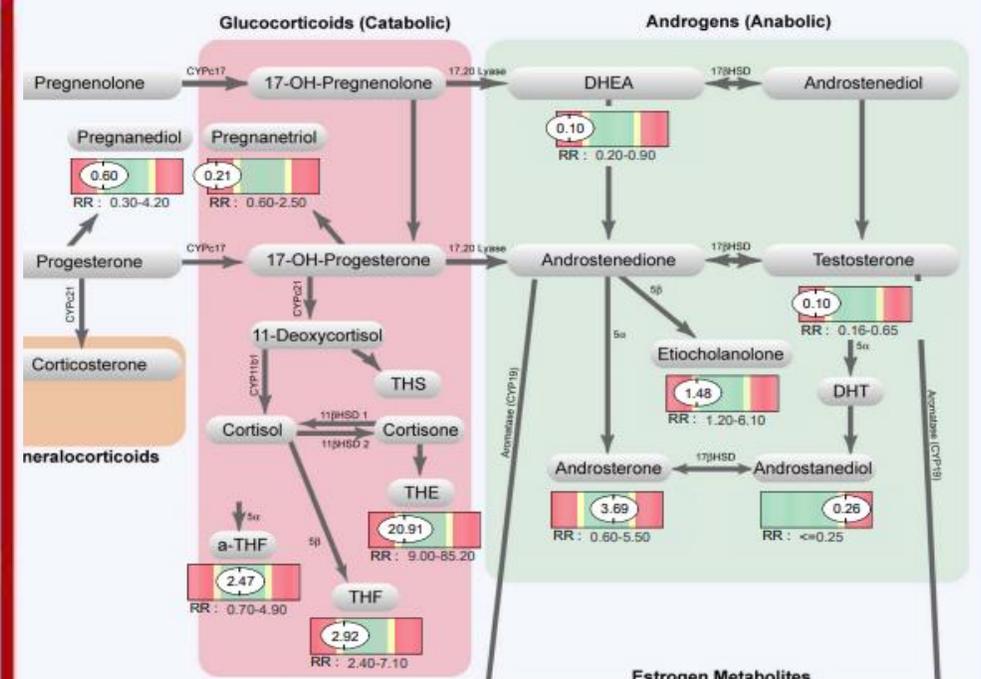


Patient: SAMPLE PATIENT

ID:

Complete Hormones

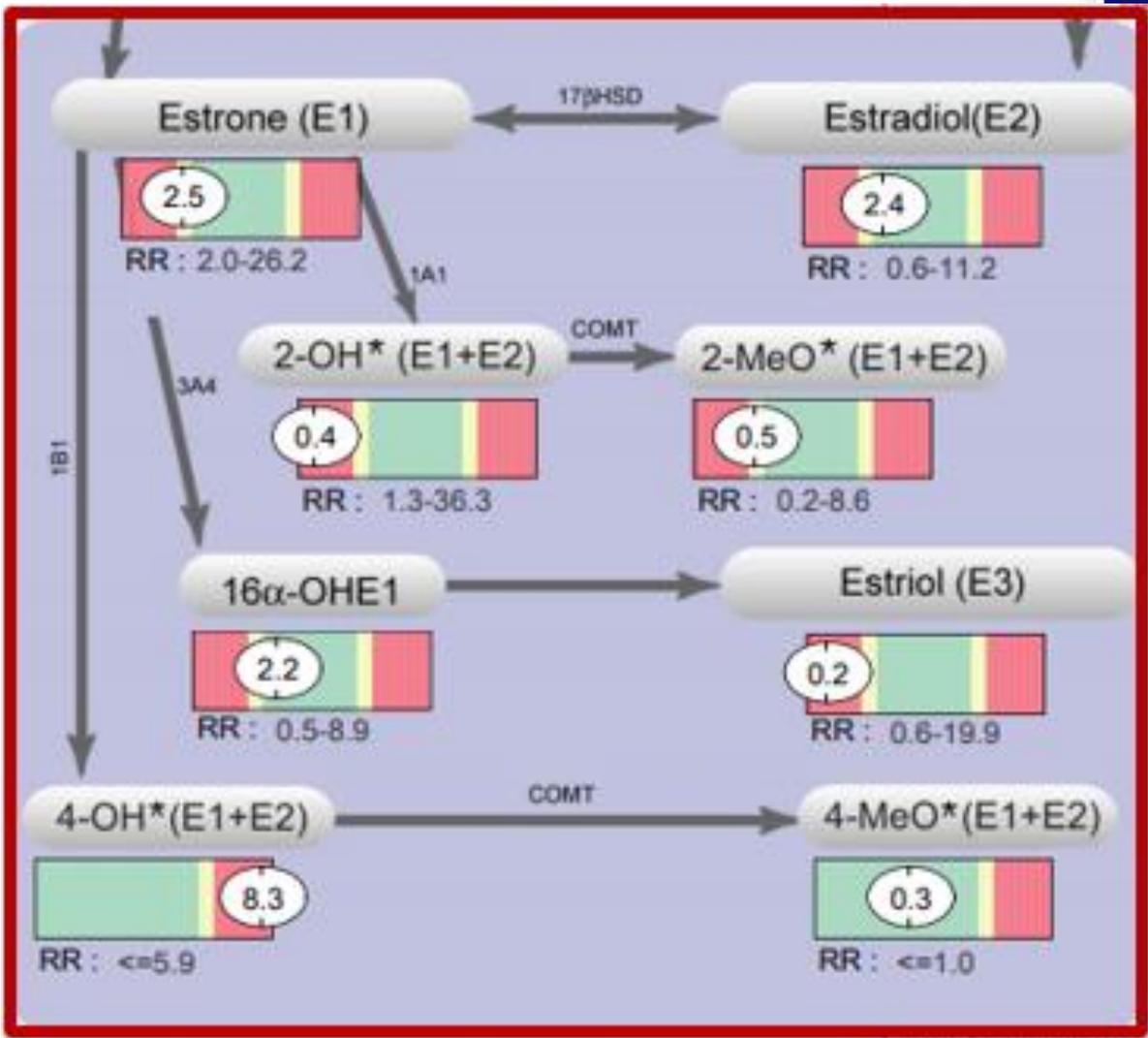
Steroidogenic Pathway At-A-Glance



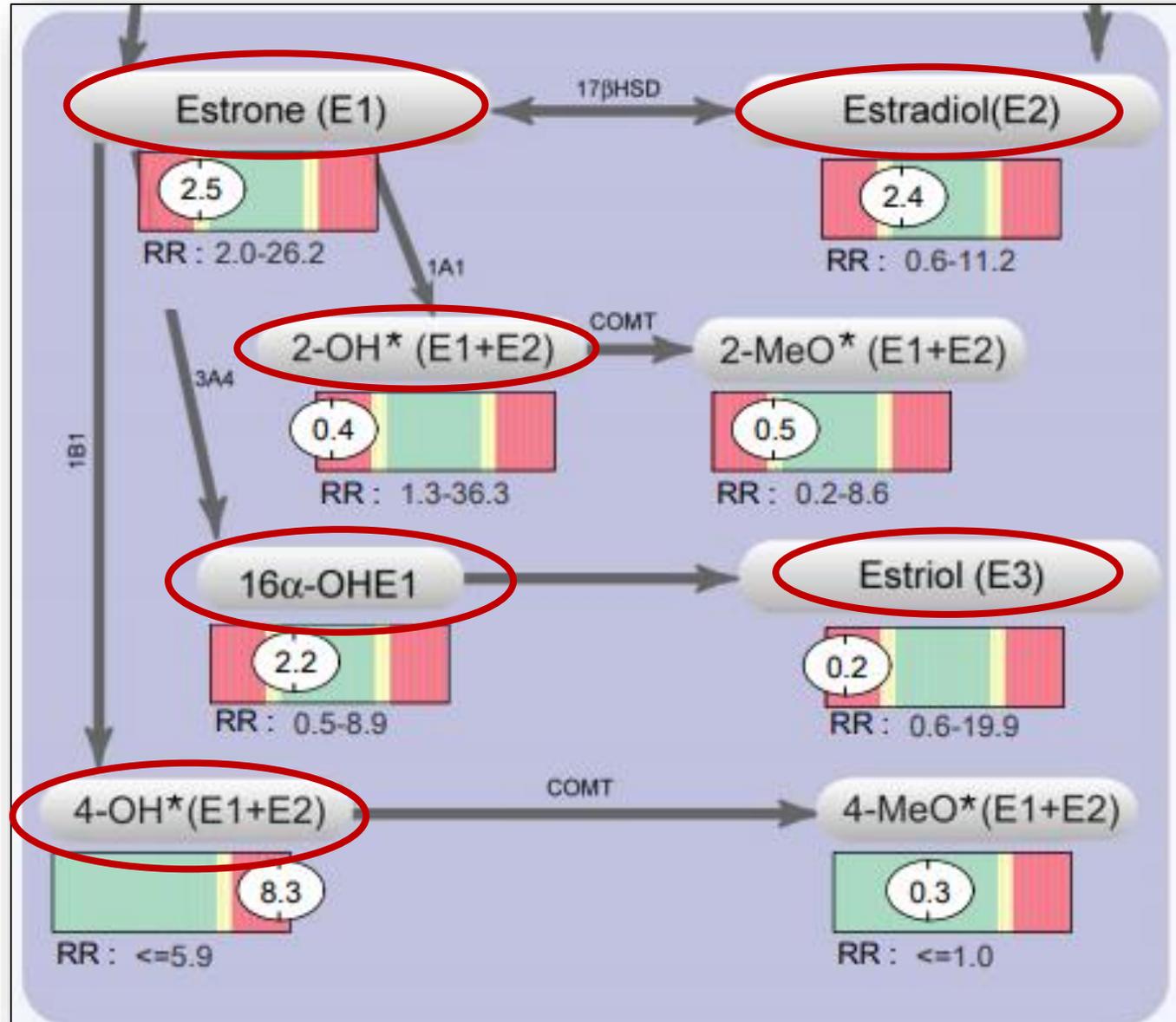
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Essential Estrogens

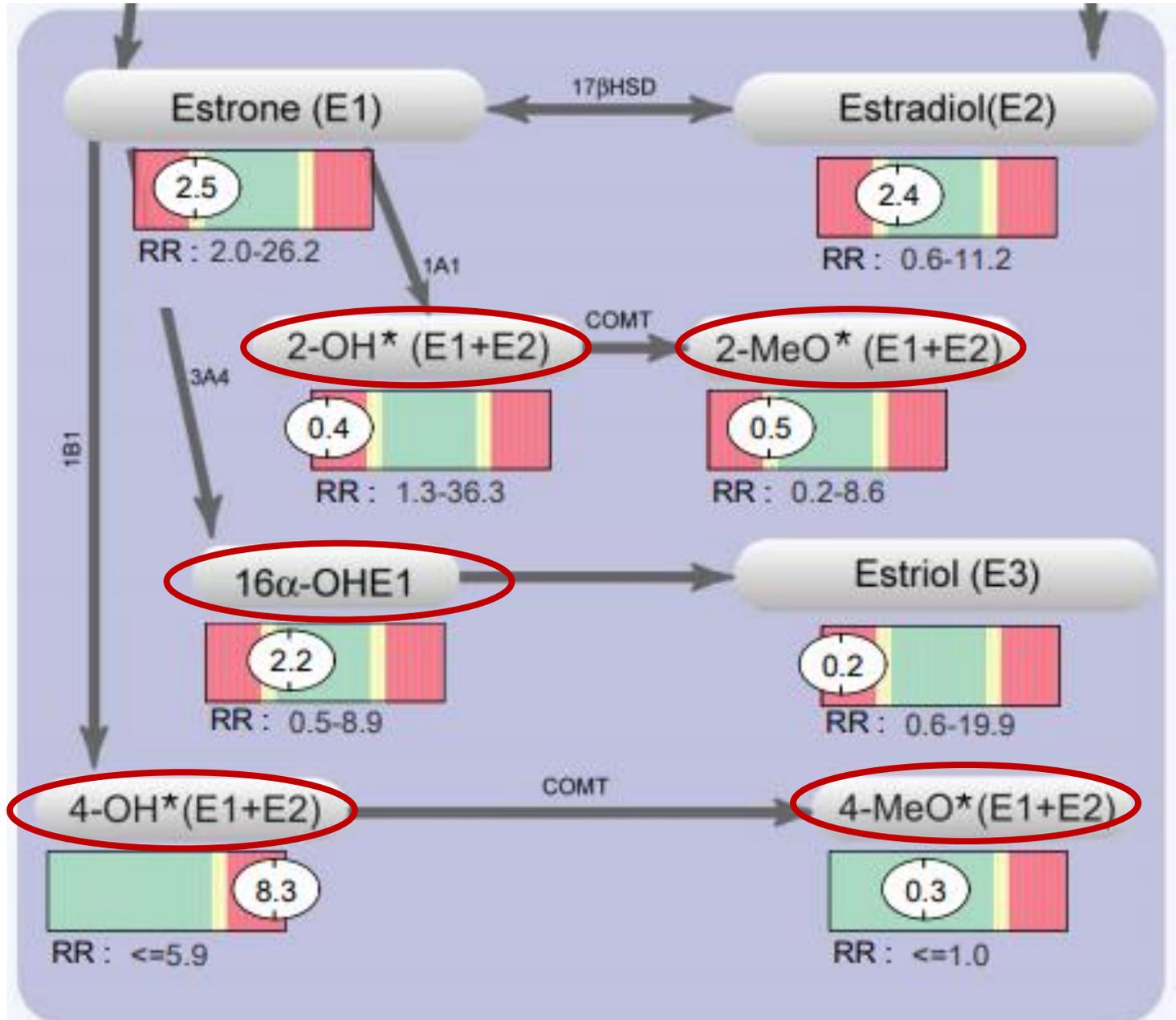




Phase 1 Estrogen Metabolites

- **2-OH (E1+E2)**- Little estrogen receptor binding, blocks action of potentially carcinogenic estrogens, seen as the safe metabolite, but must be methylated
- **16-OH (E1)** - Has full estrogenic activity, stimulates estrogen receptors, and is associated with an increased risk of breast cancer
- **4-OH (E1+E2)** -This metabolite can be oxidized rather than phase II conjugated; oxidation leads to the production of the 3,4 quinone metabolite that can create DNA adducts (damage), increasing the risk of breast cancer
 - Glutathione conjugation is known to reduce the damage to DNA

Essential Estrogens





Key Points: *Complete Hormones* profile

The *Complete Hormones* profile is a useful diagnostic tool for:

- Assessing risk for estrogen metabolism and providing useful data in designing a protocol for nutritional intervention
- Providing specific data regarding methylation activity
- Examining the role of stress on hormone metabolism
- Focusing on the parent estrogen's phase I and II metabolites

It is available as FMV or 24 hour collection profile





Salivary Testing





When is Salivary Testing More Useful?

- Unbound (bioavailable) fraction of the hormone
- Single or sequential samples collected over the day or month
- Assess diurnal patterns of hormones
 - Melatonin and cortisol
- Can be used to establish baseline levels pre-HRT
- Monitor HRT
- Special Precautions
 - Gingivitis (bleeding gums) can produce elevated hormone levels
 - Should not be used in conjunction with sublingual hormone treatments
 - Transdermal HRT can sometimes produce abnormally high levels
 - May be a factor of timing and/or site of application or contamination
 - Consider collecting sample 12 hours after last hormone application



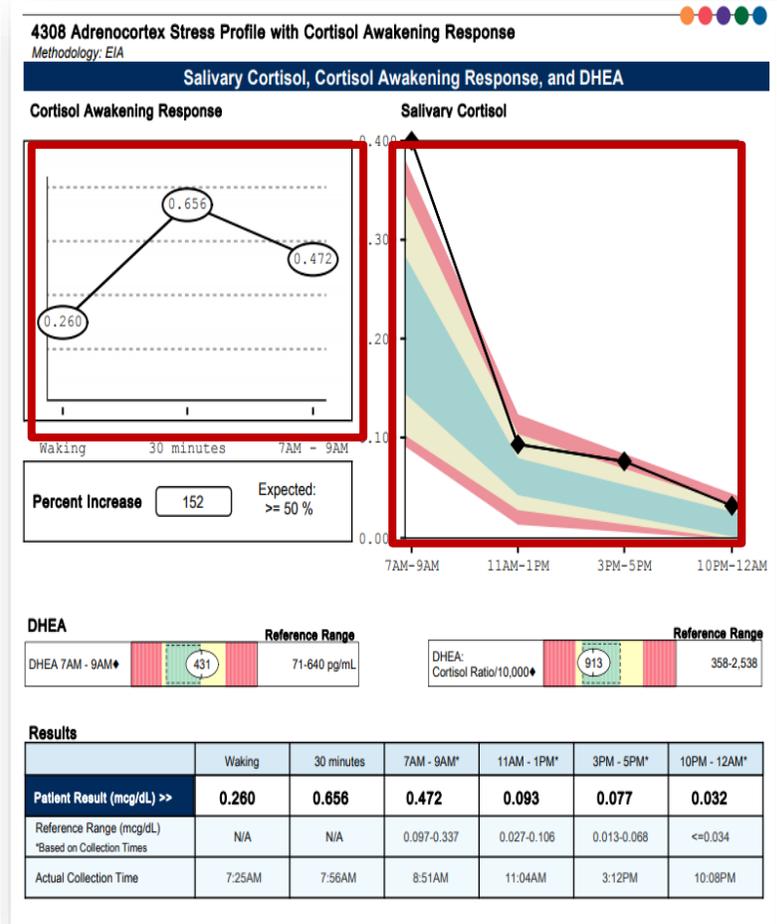
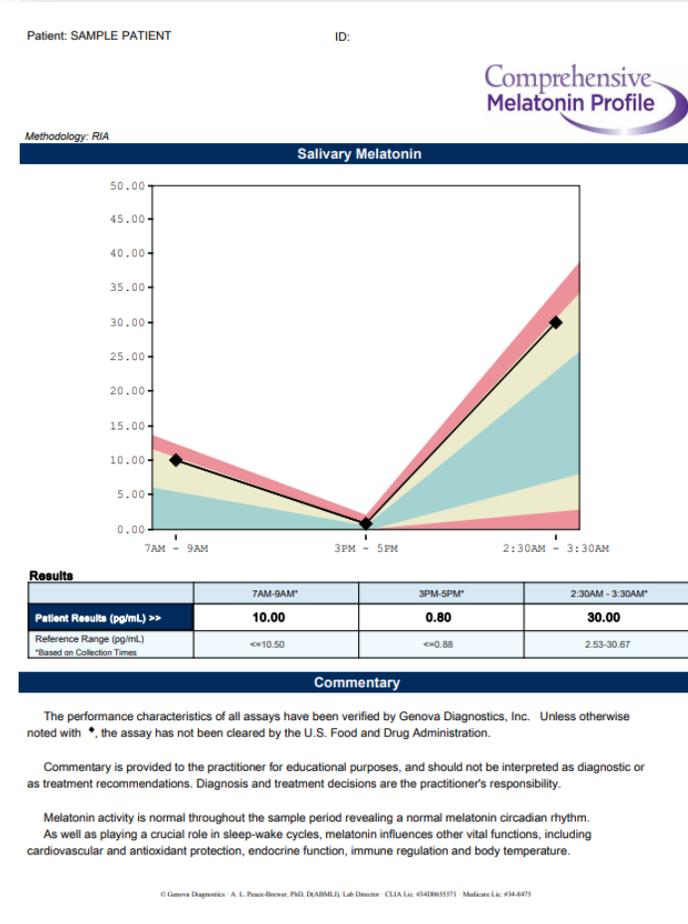
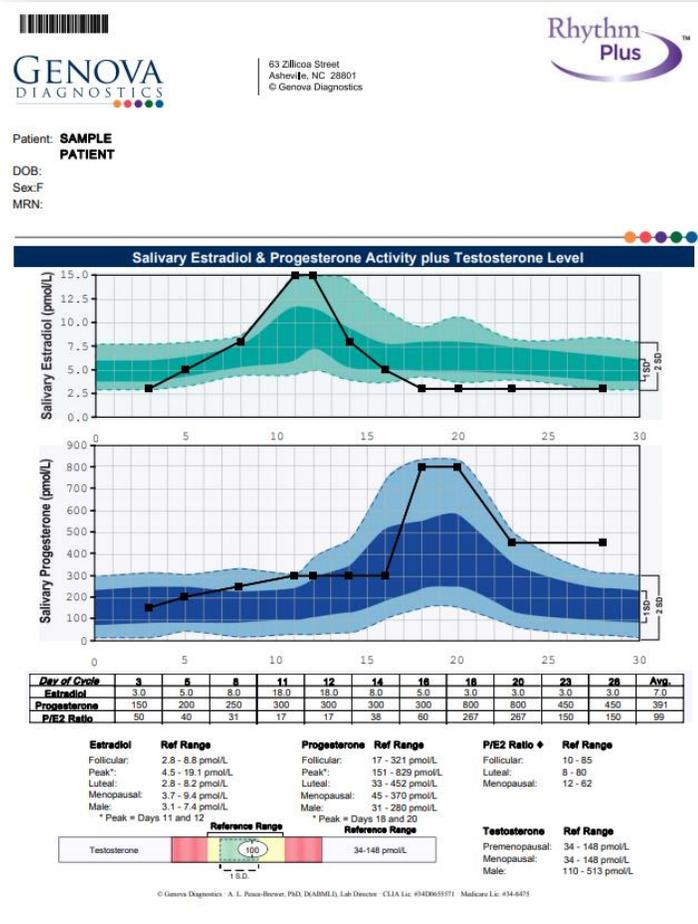
- 11 salivary samples spanning 28 day period
 - Estradiol
 - Progesterone
 - Testosterone (1 sample)



- 11 salivary samples spanning 28 day period
 - Estradiol
 - Progesterone
 - Testosterone (1 sample)
- Adrenocortex Stress Profile with or without Cortisol Awakening Response (CAR) -- (4-6 samples)
- Melatonin (3 samples)

Rhythm

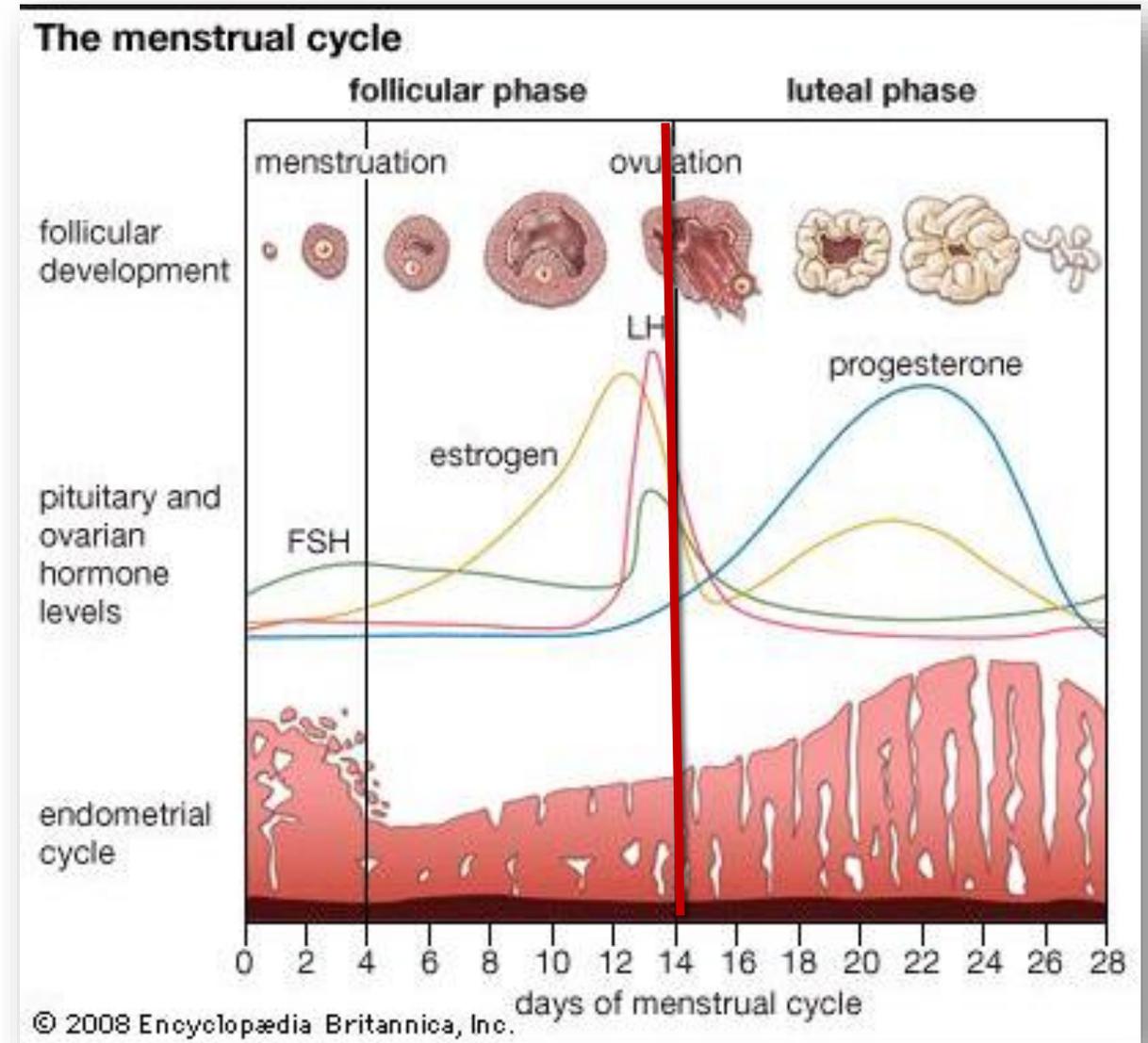
Rhythm Plus

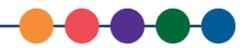




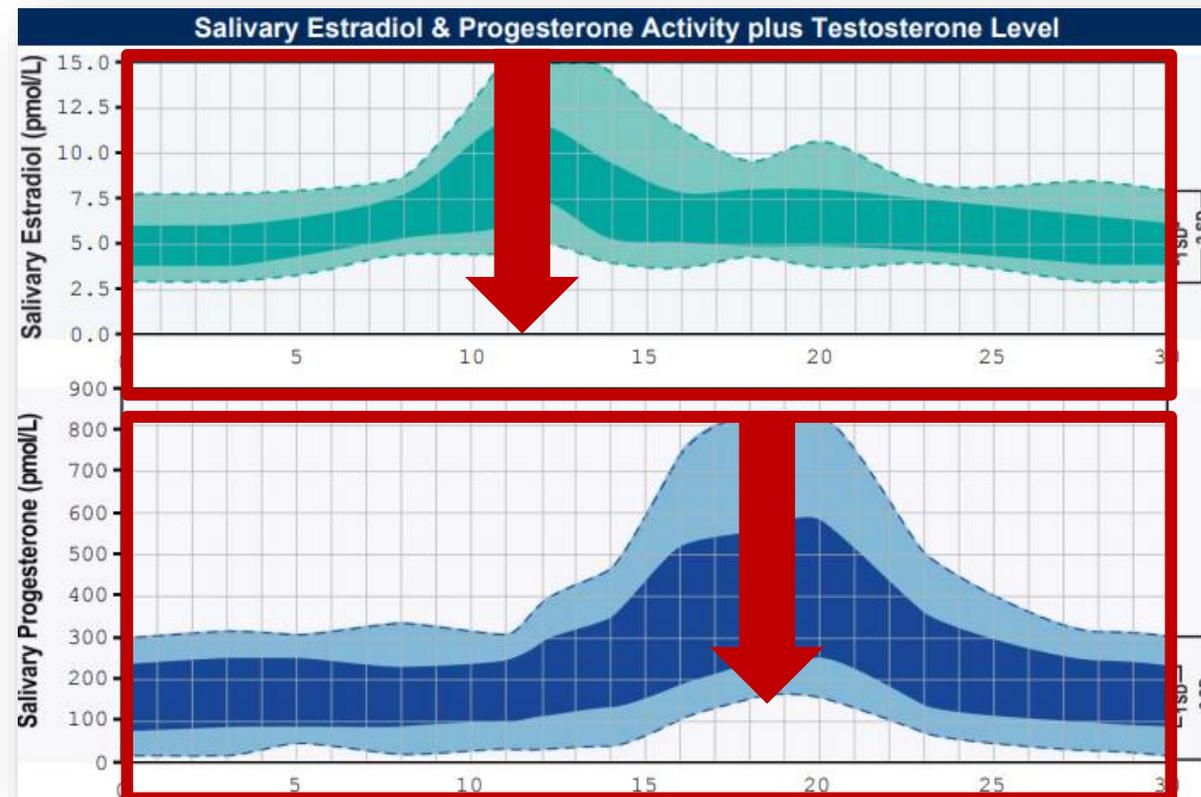
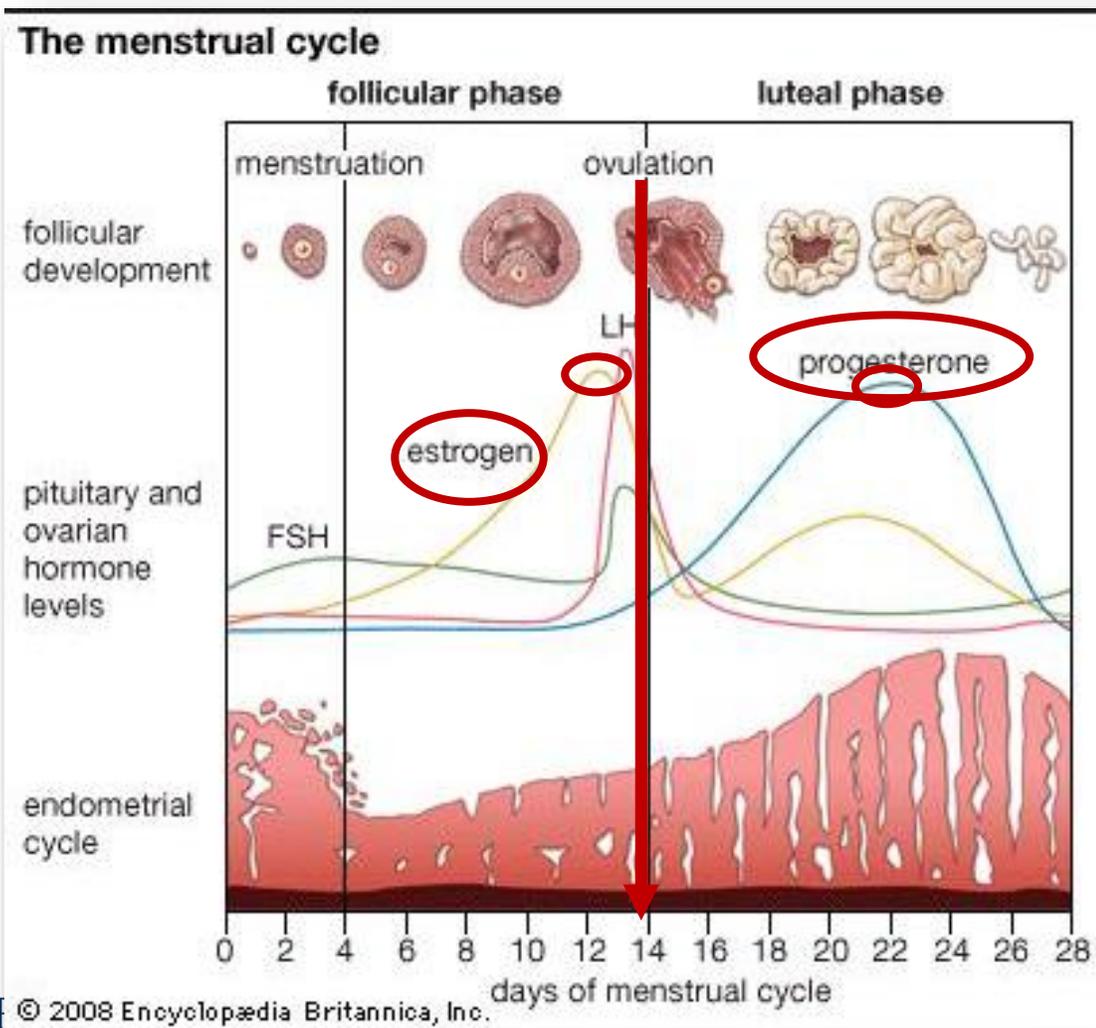
The Menstrual Cycle

- Typical 28 day cycle, comprised of two 14 day phases
- **Follicular Phase**- 14 days, includes a build-up of estradiol followed by a spike *likely* caused by ovulation
- **Luteal Phase**- 14 days, includes a luteal progesterone spike 7 days following the follicular phase spike
- Changes in the length of a cycle are most often the result of a change in the length of the follicular phase





The Menstrual Cycle





4100, Menopause Plus - Salivary Pro

Methodology: EIA, LIA



Patient: **SAMPLE PATIENT**

DOB:

Sex:

MRN:

4100 Menopau

Methodology: EIA, L

Hormone

Estradiol

Estrone (

Estriol (E

Testoster

Progester

P/E2 Rati

* The th
peri/me
hormon
microniz

† Patien

Sample #	Estr (p
1	
2	
3	
Average	

Average Estradiol ♦ pmol/L

	Refer
Follicular	2.8-8.8
Peak *	4.5-19.1
Luteal	2.8-8.2
Menopausal	3.7-9.4
Male	3.1-7.4

* Peak = Days 11 and 12

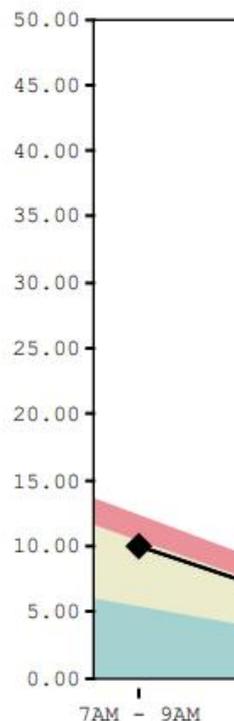
Average Estrone pmol/L

	Refer
Menopausal	31.9-18

Average Estriol pmol/L

	Refer
Menopausal	<= 133

Methodology: RIA



Results

Patient Results (pg/mL) >>	
Reference Range (pg/mL)	
*Based on Collection Times	

The performance characteristics of noted with ♦, the assay has not been

Patient: SAMPLE PATIENT

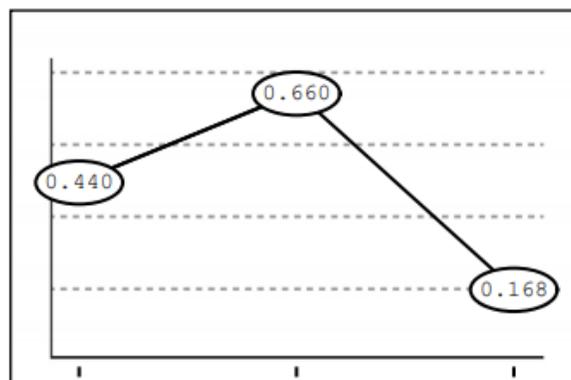
ID:



Methodology: EIA

Salivary Cortisol, Cortisol Awakening Response, and DHEA

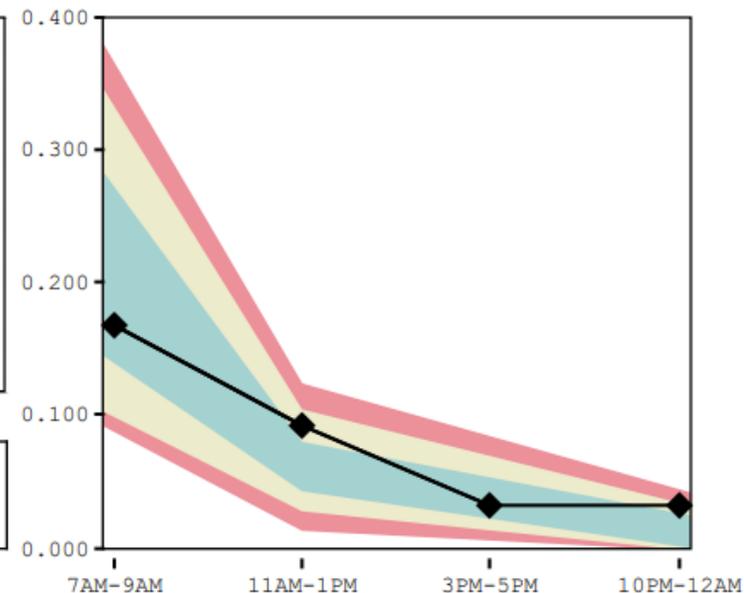
Cortisol Awakening Response



Waking 30 minutes 7AM - 9AM

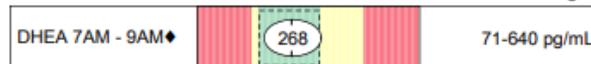
Percent Increase **50** Expected: >= 50 %

Salivary Cortisol



DHEA

Reference Range



Reference Range



Results

	Waking	30 Minutes	7AM-9AM*	11AM-1PM*	3PM-5PM*	10PM-12AM*
Patient Result (mcg/dL) >>	0.440	0.660	0.168	0.092	0.032	0.031
Reference Range (mcg/dL)	N/A	N/A	0.097-0.337	0.027-0.106	0.013-0.068	<=0.034
*Based on Collection Times						
Actual Collection Time	7:15AM	7:45AM	8:00AM	11:00AM	3:00PM	11:00PM



63 Zillicoa Street
Asheville, NC 28801
© Genova Diagnostics

Patient: **SAMPLE PATIENT**

DOB:
Sex:
MRN:

4106 One Day Hormone Check - Salivary Profile

Methodology: EIA, LIA, and RIA

Salivary Hormone Results

Estradiol ♦ pmol/L

2.5

Testosterone ♦ pmol/L

<30

Reference Range	
Follicular	2.8-8.8 pmol/L
Peak *	4.5-19.1 pmol/L
Luteal	2.8-8.2 pmol/L
Menopausal	3.7-9.4 pmol/L
Male	3.1-7.4 pmol/L

* Peak = Days 11 and 12

Reference Range	
Premenopausal	34-148 pmol/L
Menopausal	34-148 pmol/L
Male	110-513 pmol/L

Estrone pmol/L

77.7

Progesterone ♦ pmol/L

143

Reference Range	
Menopausal	31.9-183.4 pmol/L

Reference Range	
Follicular	17-321 pmol/L
Peak *	151-829 pmol/L
Luteal	33-452 pmol/L
Menopausal	45-370 pmol/L
Male	31-280 pmol/L

* Peak = Days 18 and 20

Estriol pmol/L

<70

P/E2 Ratio

57

Reference Range	
Menopausal	<= 133 pmol/L

Reference Range	
Follicular	10-85
Luteal	8-80
Menopausal	12-62

One Day Hormone Check

4100, Menopause Plus - Salivary Profile

Methodology: EIA, LIA

Salivary Hormone Results

Sample #	Estrone (E1) (pmol/L)	Estradiol (E2) (pmol/L)	Estriol (E3) (pmol/L)	Progesterone (pmol/L)
1	60.2	<2.5	<70	177
2	33.7	2.6	147	128
3	44.3	10.5	<70	165
Average	46.1	6.6	147	157

Average Estradiol ♦ pmol/L

6.6

Testosterone ♦ pmol/L

63

Reference Range	
Follicular	2.8-8.8 pmol/L
Peak *	4.5-19.1 pmol/L
Luteal	2.8-8.2 pmol/L
Menopausal	3.7-9.4 pmol/L
Male	3.1-7.4 pmol/L

* Peak = Days 11 and 12

Reference Range	
Premenopausal	34-148 pmol/L
Menopausal	34-148 pmol/L
Male	110-513 pmol/L

Average Estrone pmol/L

46.1

Average Progesterone ♦ pmol/L

157

Reference Range	
Menopausal	31.9-183.4 pmol/L

Reference Range	
Follicular	17-321 pmol/L
Peak *	151-829 pmol/L
Luteal	33-452 pmol/L
Menopausal	45-370 pmol/L
Male	31-280 pmol/L

* Peak = Days 18 and 20

Average Estriol pmol/L

147

P/E2 Ratio

24

Reference Range	
Menopausal	<= 133 pmol/L

Reference Range	
Follicular	10-85
Luteal	8-80
Menopausal	12-62





Menopause Plus

- Peri-menopausal women will experience greater fluctuations in their hormone levels
- Testing over several days is advantageous for these patients, casting a wider net and getting a calculated average
- Pre-menopausal women who do not wish to collect over 28 days may also find this profile a good fit

One Day Hormone Check

- This is a similar test, but is done in only one day
- Menopausal women may find this a good fit since their hormone levels are more stable
- Both tests allow for HPA axis with Melatonin and ASP profiles



Key Points

- Hormone testing options include blood, saliva, and urine
- Knowing the specific information you need is essential in choosing the right profile
- Each testing option has its strengths and weaknesses
- Salivary testing allows for a timeline, blood is a moment in time, and urine reflects a limited timeframe as well
- Salivary testing for a cycle is most often collected during the luteal spike of a cycle





Case Studies





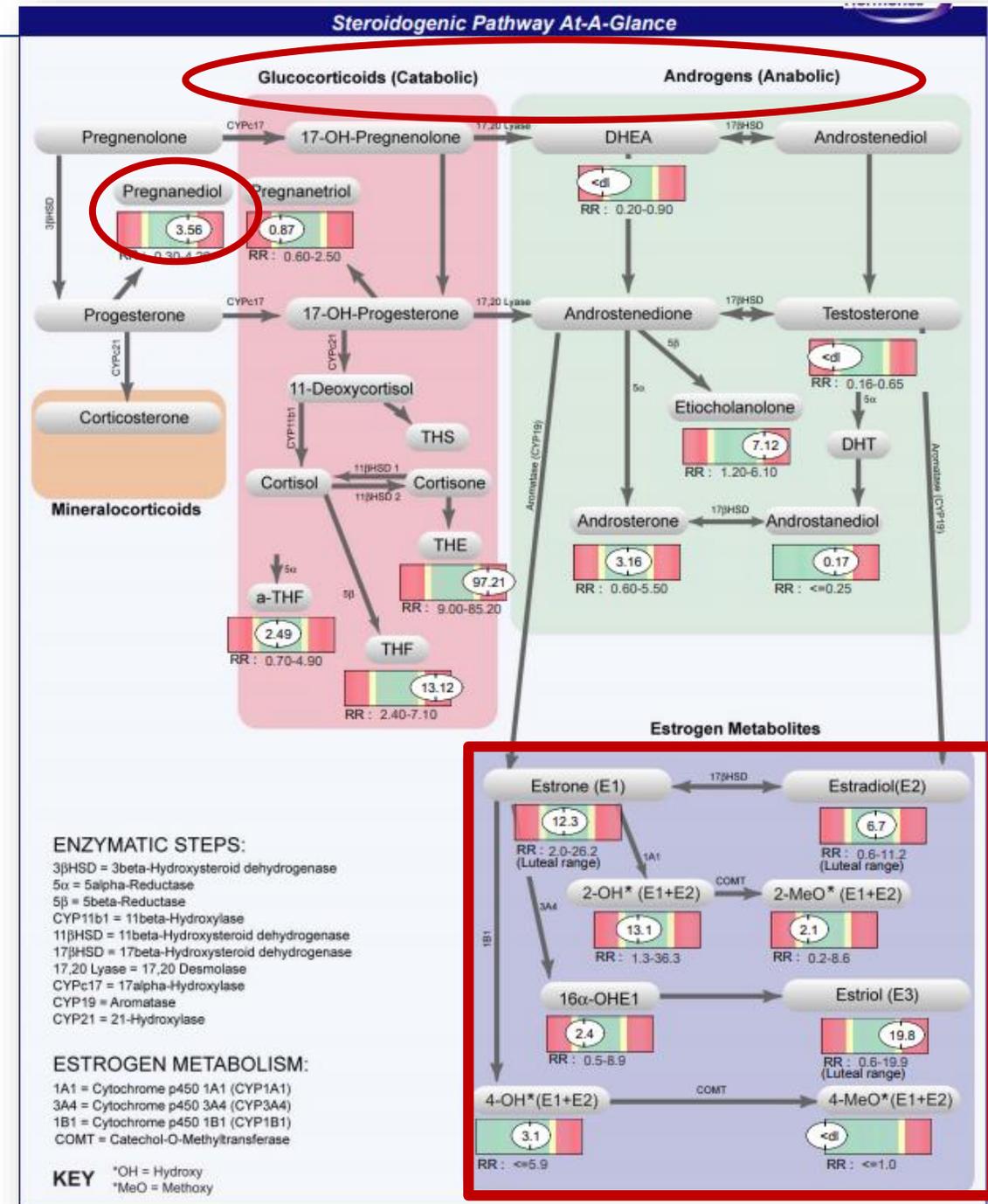
Case Study #1: Peri-Menopausal Woman

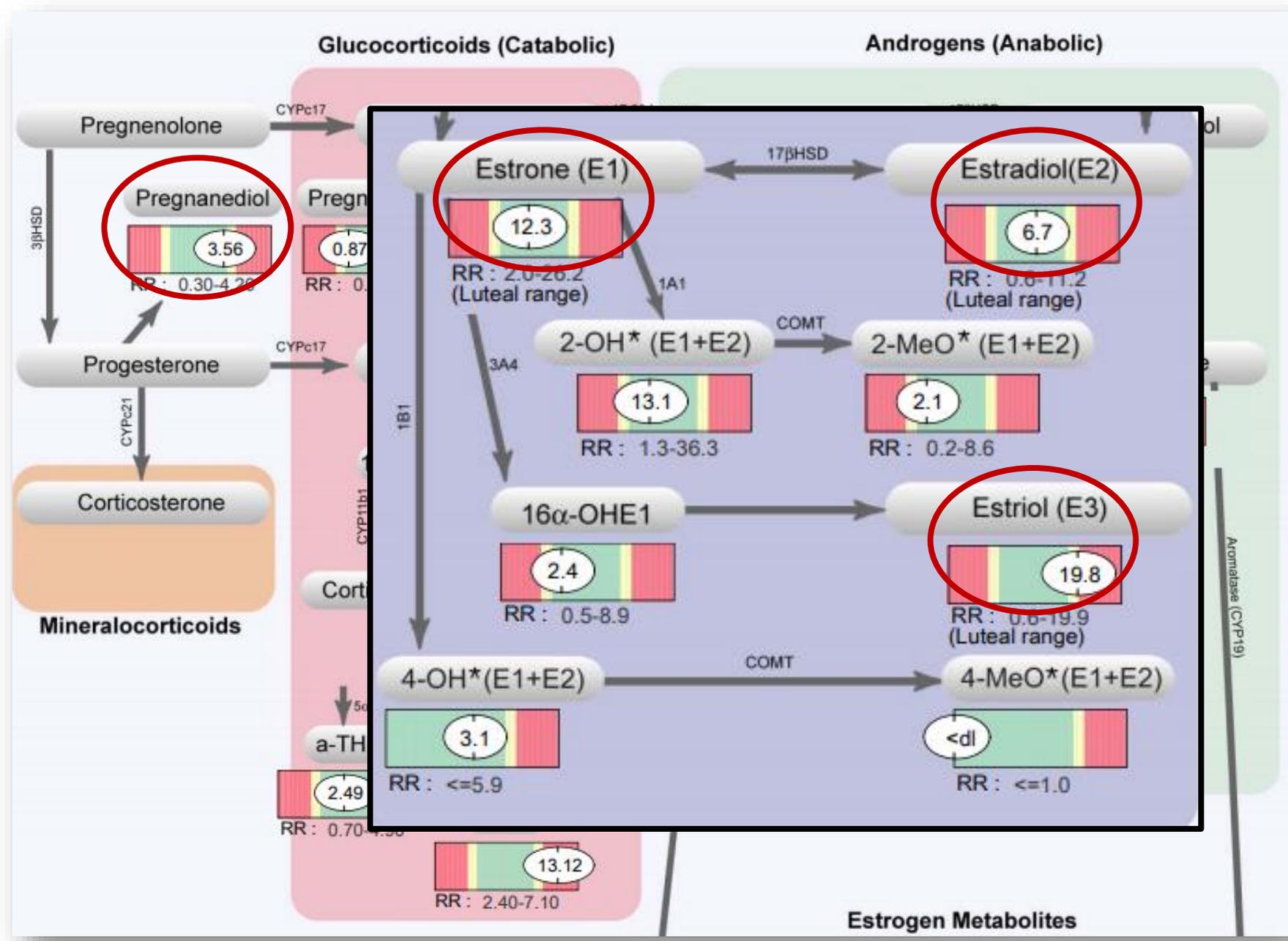
- **44 y/o female**
- **Chief complaints:** Mild depression, sleep disturbances, and low libido
- **Menstrual cycle:** irregular and often shortened
- **Family hx:** Breast cancer (mother); patient expresses concern regarding risk
- **Occupation:** Middle-school teacher
- **Medications:** Oral progesterone to aid sleep
- **Lifestyle:** Aerobics class 2x/week and Standard American Diet

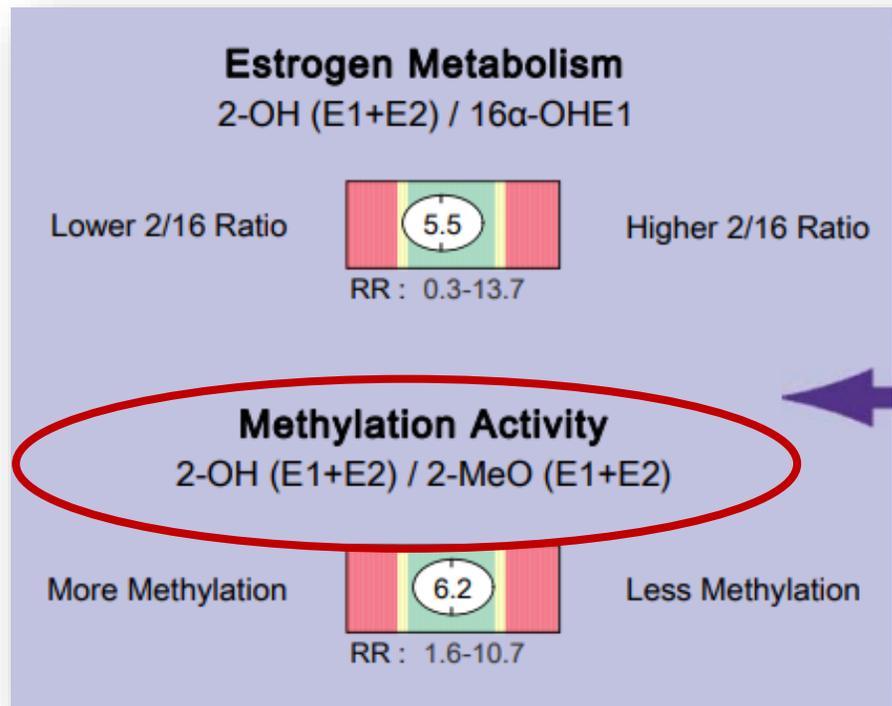
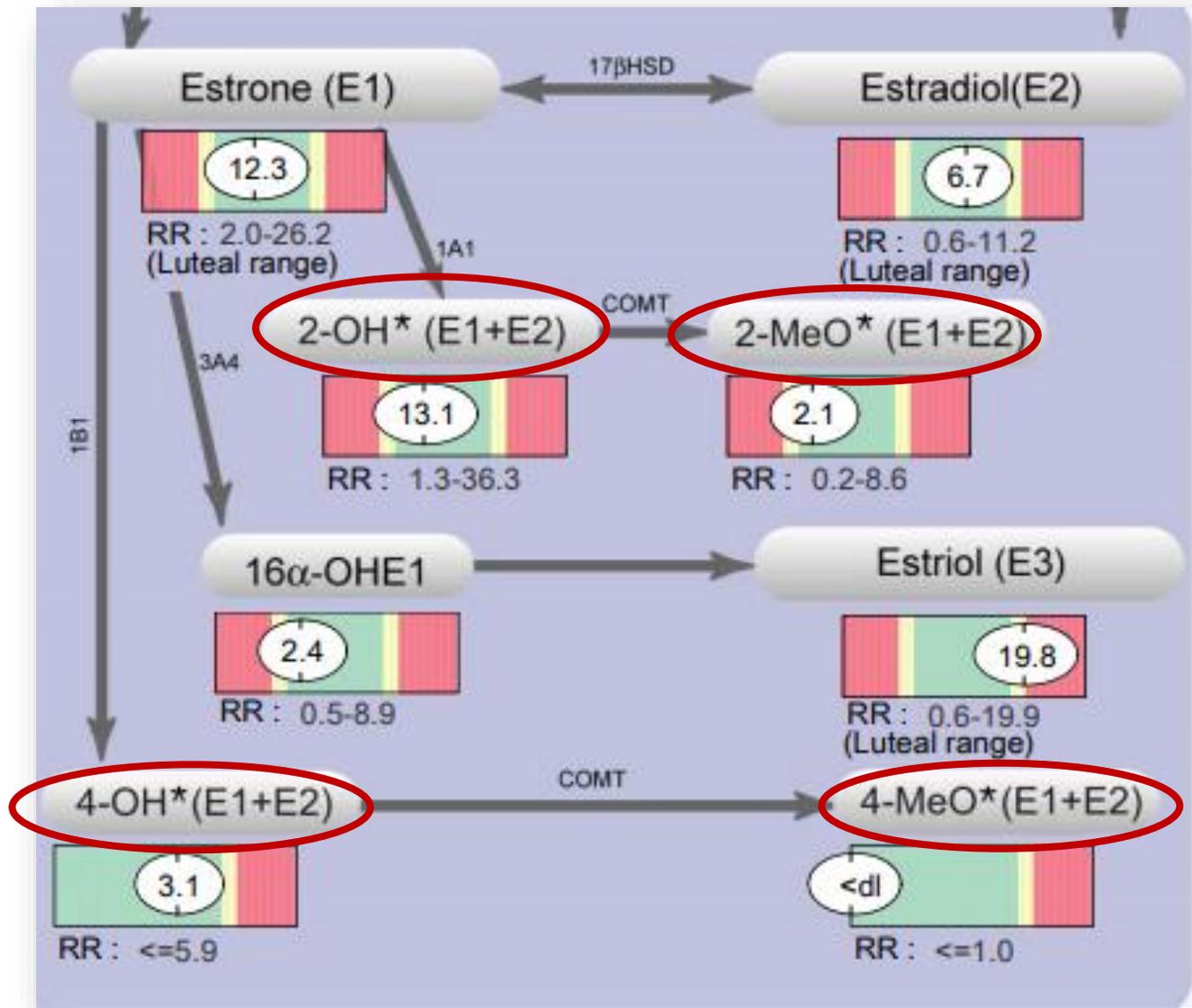


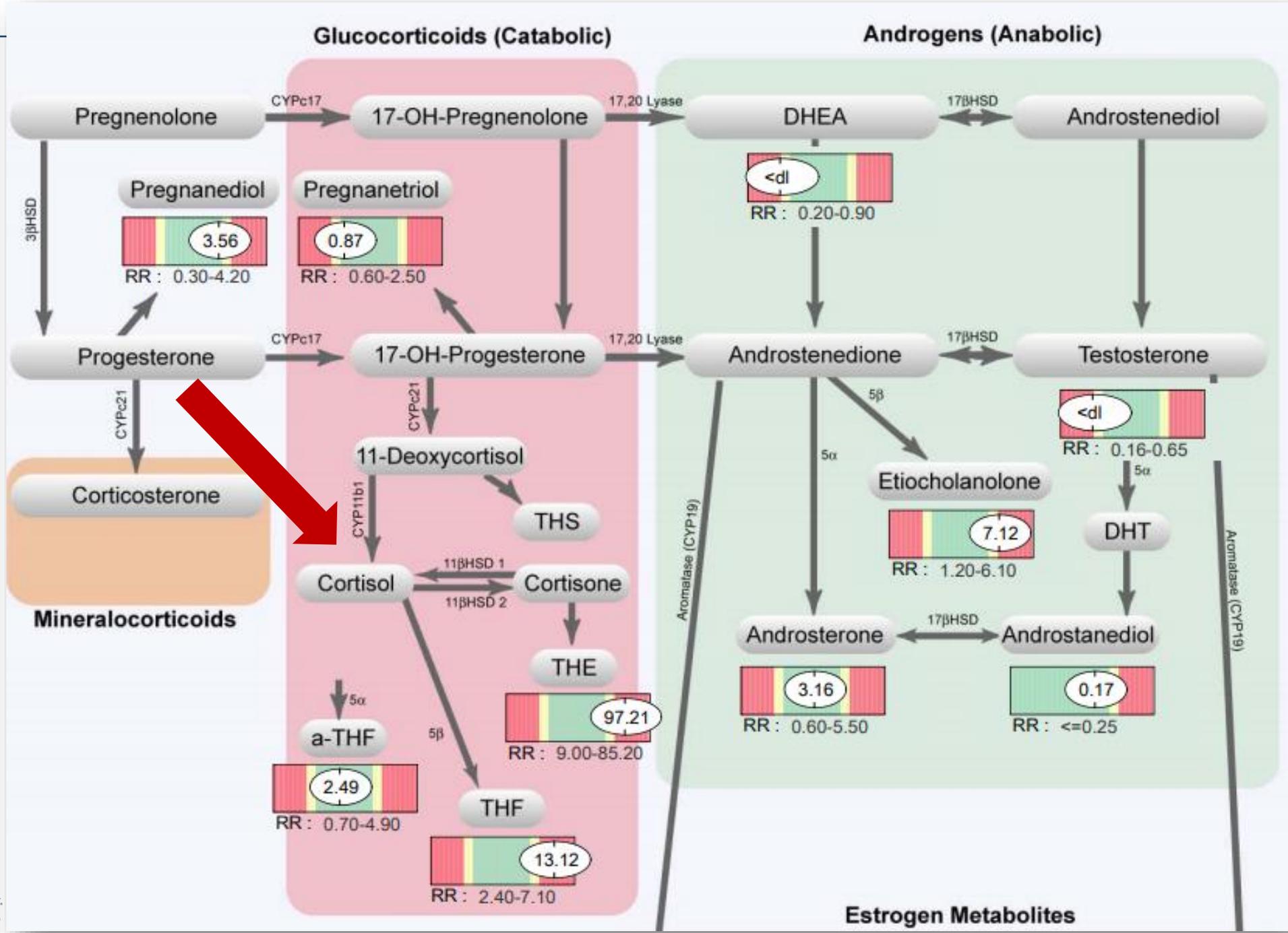
Complete Hormones 24 Hours

- Robust Progesterone
- Moderate Estrogen findings
- Anabolic/Catabolic Balance leans catabolic
- Evaluate Estrogen Metabolites
- Evaluate detoxification



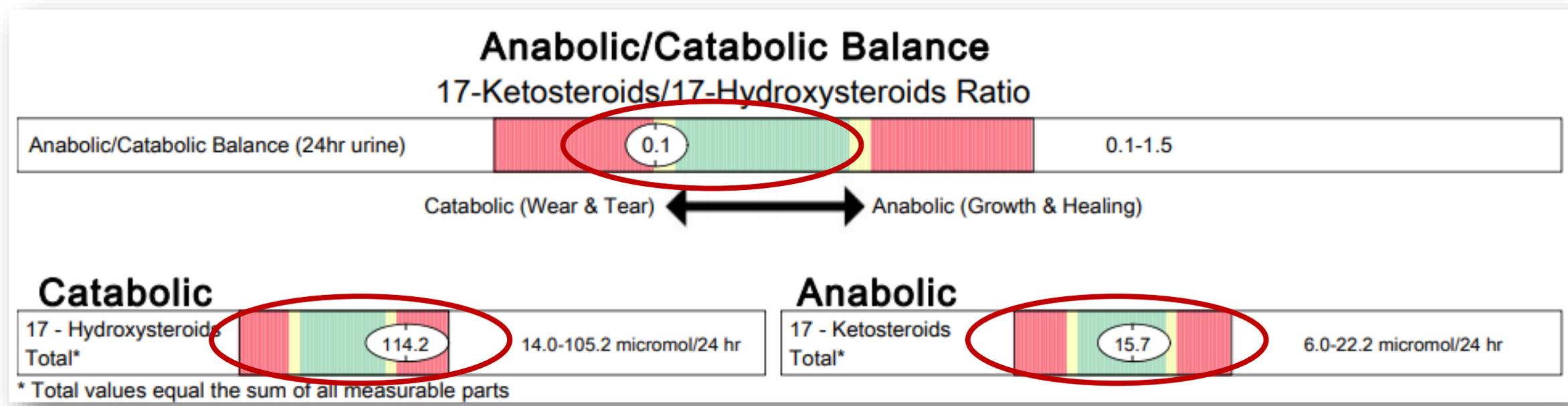








HPA Axis





Case Study # 1 Treatment

- **Hormone support:**
 - Consider lowering progesterone supplementation for better balance
- **HPA Axis**
 - Monitor cortisol/DHEA with ASP
 - Relora, Rhodiola
 - Consider **HeartMath**
 - Sleep: Magnesium at night and Phosphatidylserine 3 hours before bed
- **4-OH Estrogen Metabolite Risk**
 - Address oxidative stress to prevent quinone production
 - Increase 2-OH metabolite with DIM, I3C, and antioxidants
 - Glutathione nutrient cofactors: NAC, glycine, glutamine, Mg, and B6
- **Diet/Lifestyle**
 - Consider Mediterranean diet





Case Study #2: Menopausal Woman

- **62 y/o female**
- **Chief Complaints:** Fatigue, difficult sleep, foggy thinking, memory lapses, low libido, “gut issues” include bloating, and intermittent constipation
- **Occupation:** Public relations executive and high stress
- **Medical Hx:** Low thyroid function; not taking thyroid meds
- **Medications:** B-complex, intermittent probiotic and prebiotics
- **Lifestyle:** Diet rich in vegetables, includes fish, and poultry
 - Very little consistent exercise; occasional weekend hikes with friends





Menopause Plus

- Low Estradiol
- Moderate Estrone
- Estrone increases risk
- Low Progesterone
- Low Testosterone

Salivary Hormone Results

Sample #	Estrone (E1) (pmol/L)	Estradiol (E2) (pmol/L)	Estriol (E3) (pmol/L)	Progesterone (pmol/L)
1	92.4	2.6	<70	154
2	80.5	2.7	<70	83
3	137.0	2.7	<70	98
Average	103.3	2.7	NR	112

Average Estradiol ♦ pmol/L 2.7

Reference Range	
Follicular	2.8-8.8 pmol/L
Peak *	4.5-19.1 pmol/L
Luteal	2.8-8.2 pmol/L
Menopausal	3.7-9.4 pmol/L
Male	3.1-7.4 pmol/L
* Peak = Days 11 and 12	

Testosterone ♦ pmol/L <30

Reference Range	
Premenopausal	34-148 pmol/L
Menopausal	34-148 pmol/L
Male	110-513 pmol/L

Average Estrone pmol/L 103.3

Reference Range	
Menopausal	31.9-183.4 pmol/L

Average Progesterone ♦ pmol/L 112

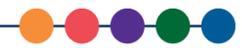
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Menopausal	45-370 pmol/L
Male	31-280 pmol/L
* Peak = Days 18 and 20	

Average Estriol pmol/L NR

Reference Range	
Menopausal	<= 133 pmol/L

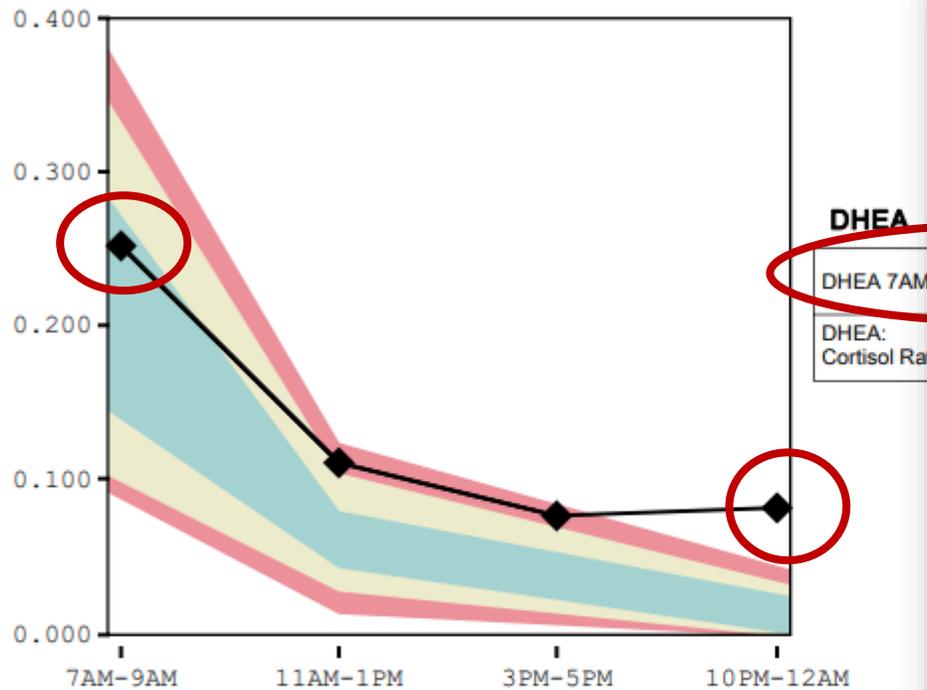
P/E2 Ratio 41

Reference Range	
Follicular	10-85
Luteal	8-80
Menopausal	12-62



Salivary Cortisol and DHEA

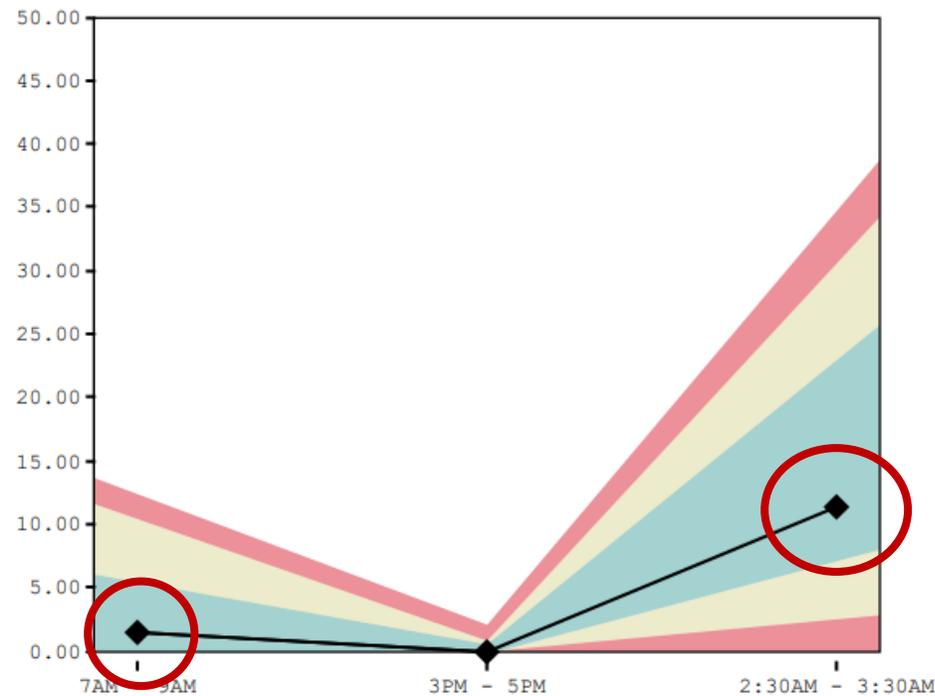
Salivary Cortisol



Results

	7AM-9AM*	11AM-1PM*
Patient Result (mcg/dL) >>	0.252	0.110
Reference Range (mcg/dL) *Based on Collection Times	0.097-0.337	0.027-0.106
Actual Collection Time	9:00AM	1:00PM

Salivary Melatonin



Results

	7AM-9AM*	3PM-5PM*	2:30AM - 3:30AM*
Patient Results (pg/mL) >>	1.40	<0.50	11.38
Reference Range (pg/mL) *Based on Collection Times	<=10.50	<=0.88	2.53-30.67
Actual Collection Time	5:00PM	12:00AM	



Treatment Considerations

- Check thyroid levels: Comprehensive Thyroid Assessment
- Sleep-ASP indicates elevated evening cortisol
 - Support adrenal function, consider Relora, adaptogens, and DHEA
 - L-Theonine, Phosphatidylserine, and Magnesium
- Consider HT, including low progesterone
 - Consider Testosterone; monitor carefully
 - Complete Hormones urine to monitor metabolites to assess risk
- Monitor gut: GI Effects Comprehensive Profile-Stool





Key Points

- Hormones are all about balance
- Urine testing provides insight into metabolites and risk assessment
- Premenopausal woman should consider the ***Rhythm Plus***
- Peri-menopausal testing will reflect fluctuating levels, consider the ***Rhythm Plus*** or ***Menopause Plus*** to monitor changes
- Menopausal woman should consider the ***One Day Hormone Check*** or ***Menopause Plus*** Profile





Objectives:

Following this presentation, participants will be able to:

- Distinguish the pros and cons of serum, salivary, and urinary hormone testing options
- Recognize which tests may best serve the specific needs of the patient
- Utilize testing in the context of case studies

OBJECTIVE





Stephen Goldman, DC
Presenter

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***We look forward to
hearing from you!***

Questions?



Upcoming ^{LIVE} GDX Webinar Topics



Epigenetics: Telling Your Genes How to Behave (May 2019)

- Presented by Ann Shippy, MD (5/22/19)

Utilizing Nutritional Testing in Pain Management (June 2019)

- Presented by Elizabeth Board, MD (6/26/19)

Parasitology Stool Diagnostics: From Basics to Blastocystis (July 2019)

- Presented by Christine Stubbe, ND, FABNO (7/24/19)

**Register for upcoming ^{LIVE} GDX webinars and
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Hormone Testing

Selecting the Right Profile for Your Complex Patient

Stephen Goldman, DC

Medical Education Specialist, Genova Diagnostics

