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Cortisol Interpretation

Building Your Expertise in HPA Axis Interpretation Using the DUTCH Dozen

Carrie Jones, ND, FABNE, MPH, MSCP

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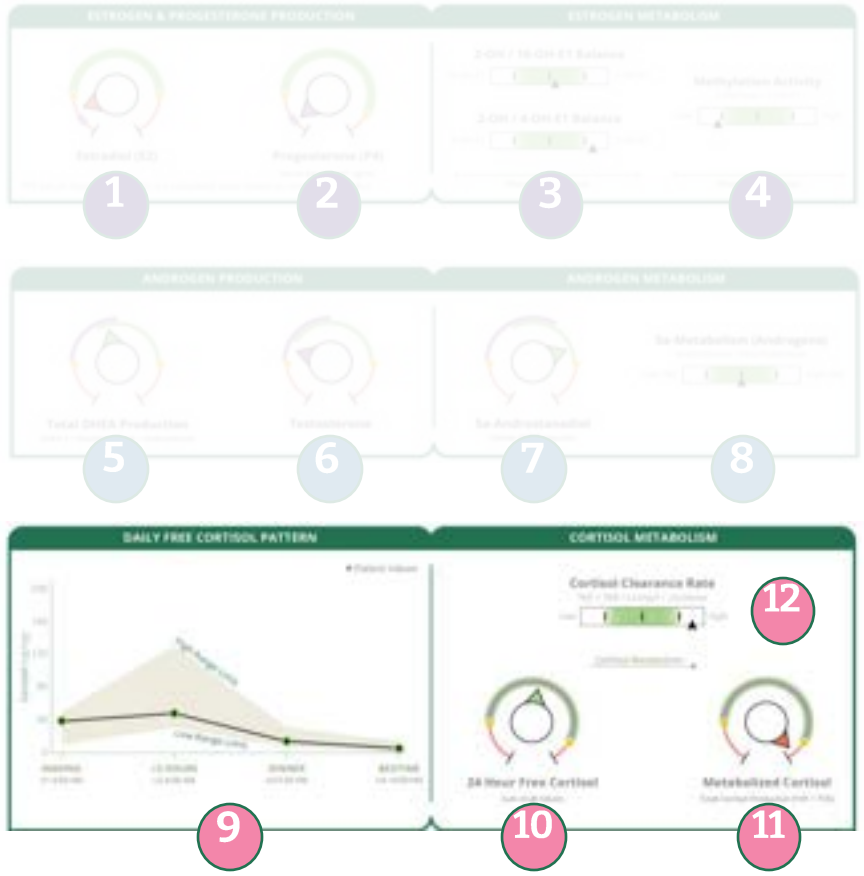
Carrie Jones, ND, FABNE, MPH, MSCP is an internationally recognized speaker, consultant, author and educator on the topic of women's health and hormones with over 20 years in the industry. Dubbed the "Queen of Hormones", Dr. Jones is a Naturopathic Physician who did her 2-year residency focused on women's health and endocrinology. She went on to get her Master of Public Health (MPH), was one of the first to become board certified through the American Board of Naturopathic Endocrinology (FABNE), and is a Menopause Society Certified Practitioner (MSCP). She was the first Medical Director for Precision Analytical (the DUTCH Test), the first Head of Medical Education at Rupa Health (a Fullscript Company) and was on Under Armour's Human Performance Council. She ser ves as a consultant and educator for several women's health and lab-focused companies. Dr. Jones co-hosted the highly popular show, the Root Cause Medicine Podcast that has over 10 million downloads and now hosts her own, Hello Hormones podcast. She is the Chief Medical Officer at NuEthix Formulations.

Learning Objectives

- Understand the purpose and clinical application of the **four cortisol-related key elements** of the DUTCH Dozen.
- Evaluate the **daily free cortisol pattern** and why it might be lower or higher than optimal.
- Assess the total daily free cortisol (**24 Hour Free Cortisol**) in circulation and its significance.
- Determine the total adrenal production of cortisol (**Metabolized Cortisol**) and explain how it may not always align with 24 Hour Free Cortisol levels.
- Analyze the rate of cortisol clearance (**CCR**) to identify abnormally sluggish or excessive clearance and its contributing factors.

The DUTCH Dozen



Estrogen Progesterone

1. Assess estrogen levels given the patient's reproductive status
2. Assess progesterone levels given the patient's reproductive status
3. Assess 2-OH preference in phase 1 estrogen metabolism
4. Assess methylation of 2-OH estrogens

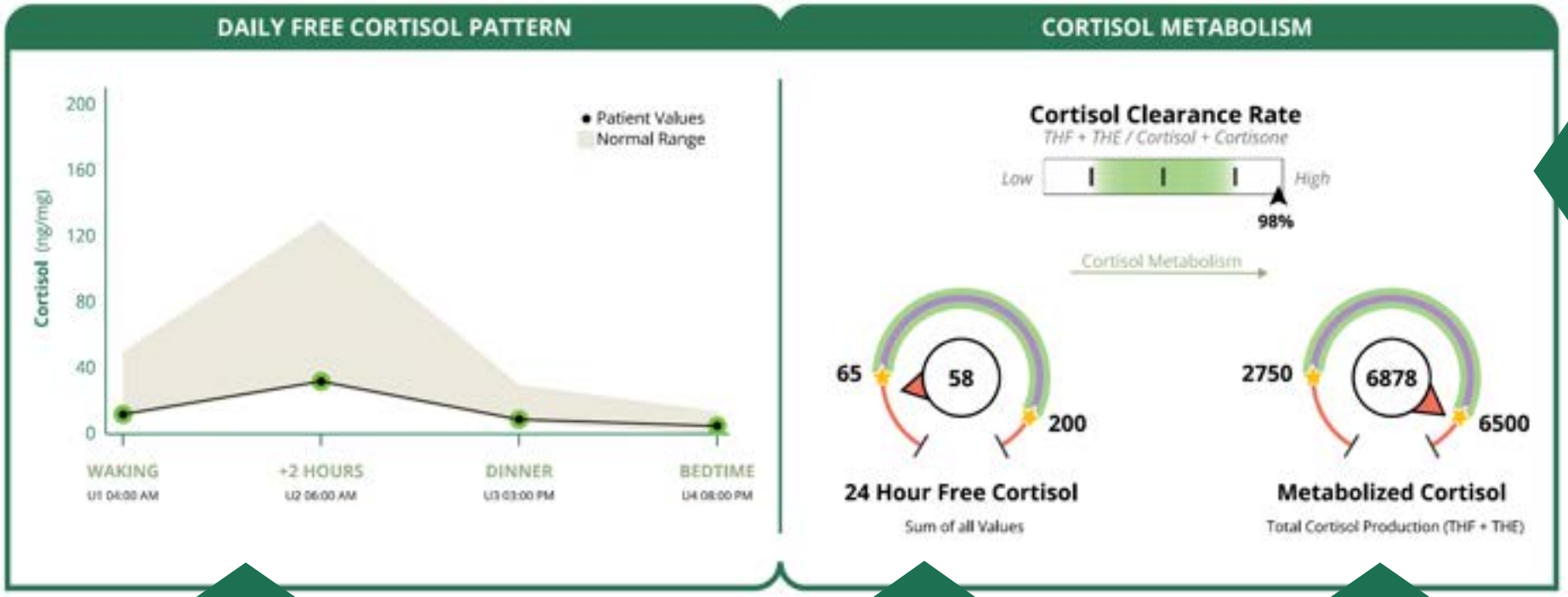
Androgens

5. Assess adrenal androgen levels (Total DHEA)
6. Assess testosterone levels
7. Assess cellular production of 5a-DHT via 5a-androstanediol
8. Assess if there is a preference for the more potent alpha metabolism of the androgens

Cortisol

9. Assess the daily free cortisol pattern
10. Assess the daily total of free cortisol in circulation (24hr Free Cortisol)
11. Assess the total cortisol produced by the adrenal glands (Metabolized Cortisol)
12. Assess the rate of cortisol clearance from the body

The DUTCH Dozen: Cortisol



Assess the rate of cortisol clearance from the body

12

Assess the daily free cortisol pattern

9

Assess the daily total of free cortisol in circulation

10

Assess the total cortisol produced by the adrenal glands (Metabolized Cortisol)

11

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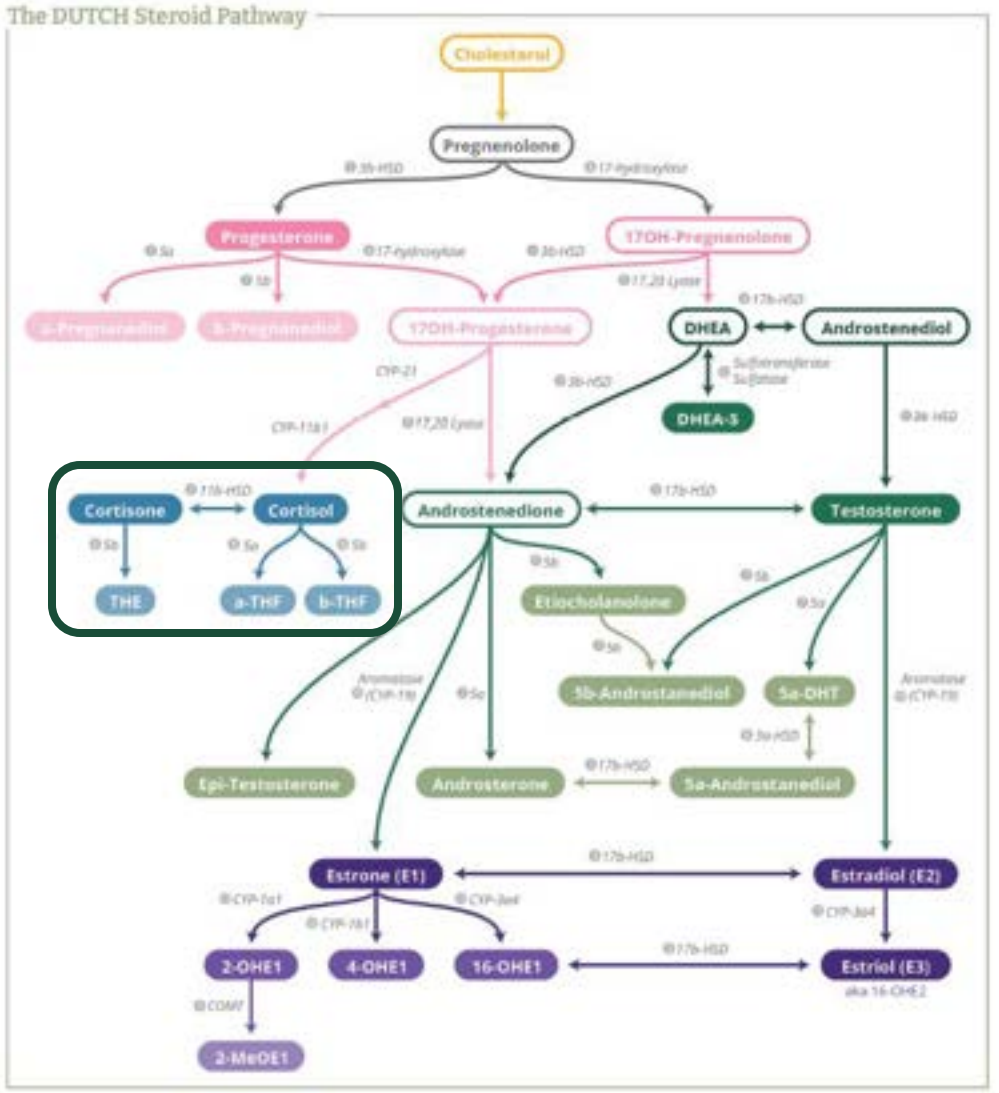
The DUTCH Dozen: Cortisol

Cortisol:

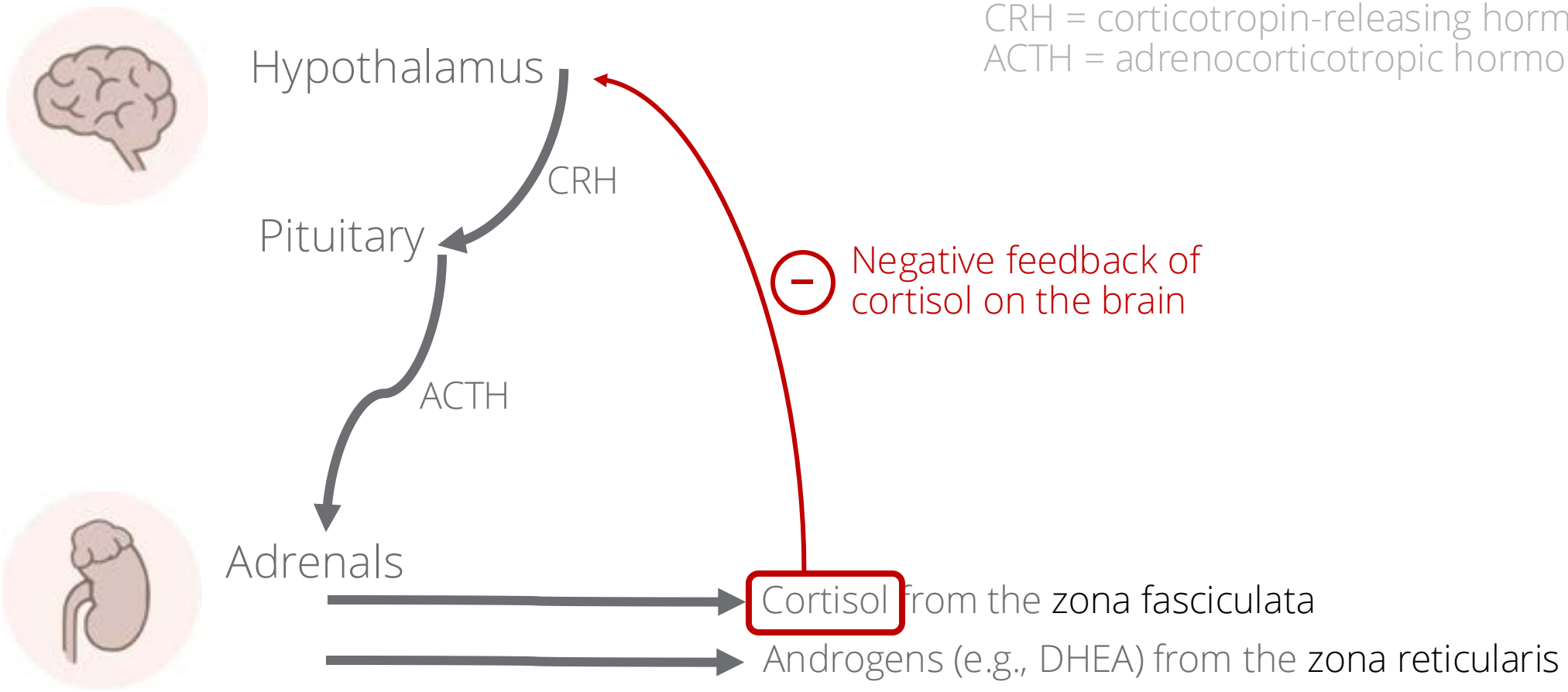
- Glucocorticoid and essential hormone.
- Released daily in small amounts in a circadian rhythm.
- Released in larger amounts in response to stress.
- Also helps to control blood sugar levels, regulates mood and metabolism, reduces inflammation, and assists with memory formation.
- Made in the zona fasciculata of the adrenal cortex in response to ACTH signaling from the pituitary.



The DUTCH Dozen: Cortisol

Hypothalamic-Pituitary-Adrenal (HPA) Axis Communication

CRH = corticotropin-releasing hormone
ACTH = adrenocorticotropic hormone



All images from http://canva.com

The DUTCH Dozen: 9 Free Cortisol Pattern

HPA axis dysfunction often starts with *high* cortisol during the body's response to stress.

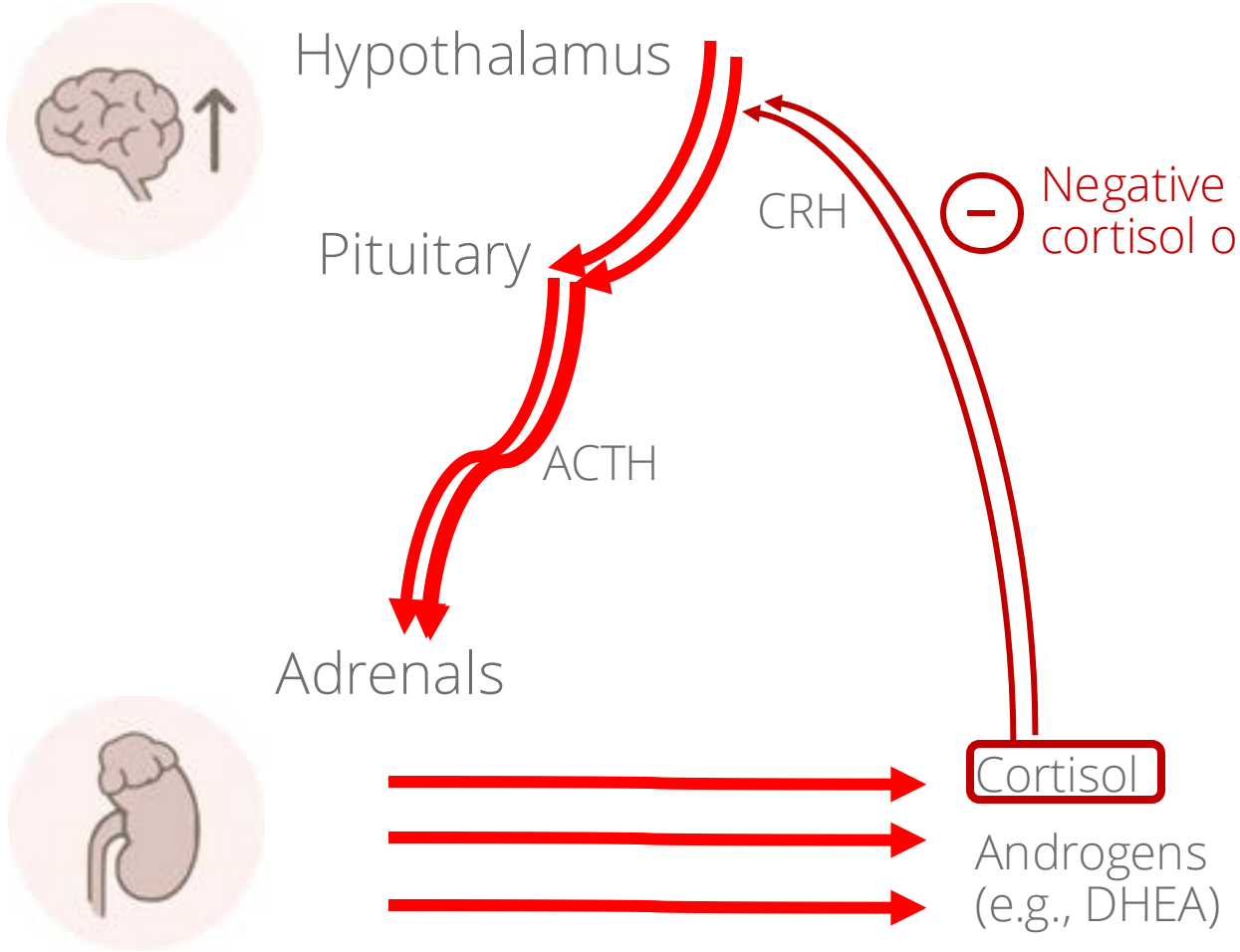
- Stress can be perceived stress, illness, injury, strenuous exercise, etc.

Acute cortisol effects: Fight, Flight or Freeze

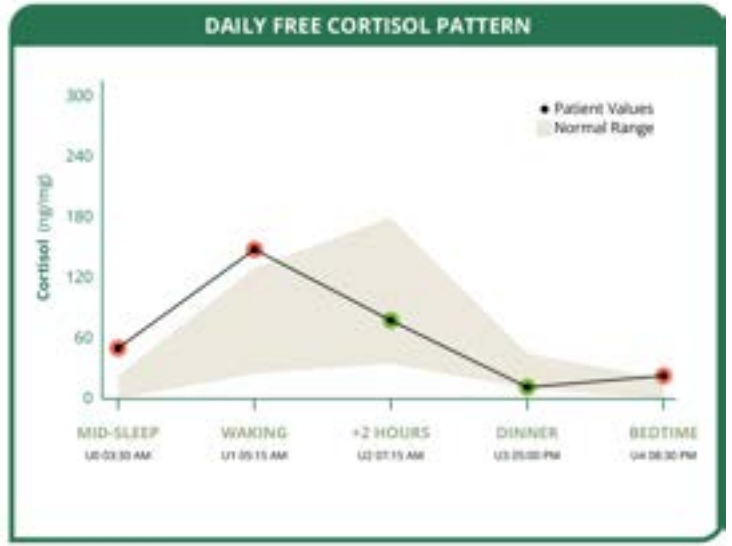
- Maintains glucose levels for energy
  - Gluconeogenesis: mobilizes glucose from fat and liver cells
  - Blocks insulin to maintain blood sugar for energy
- Increased focus: mental and physical
- Increased HR, blood pressure (vasoconstriction), muscle blood flow
- Decreased digestive effort
- Decreased sex hormone response
- Decreased immune response

The DUTCH Dozen: 9 Free Cortisol Pattern

Over time, chronically high cortisol can lead to...



Negative feedback of cortisol on the brain

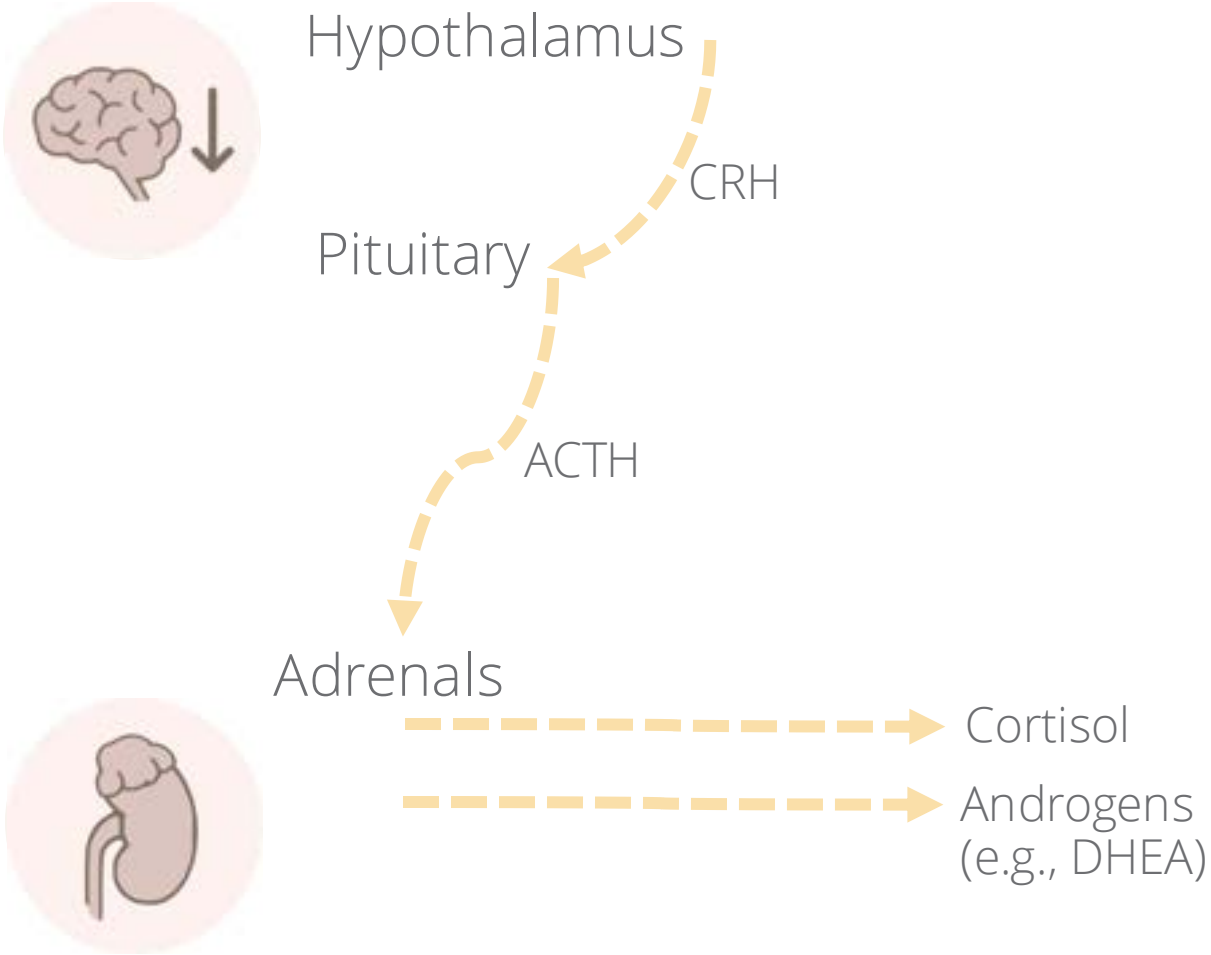


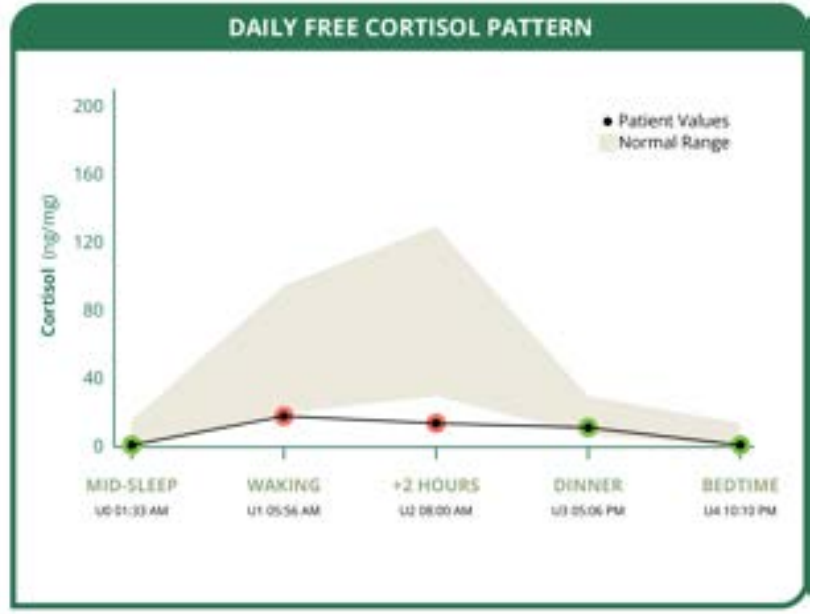
48-year-old male
Significant sleep issues

All images from http://canva.com

The DUTCH Dozen: 9 Free Cortisol Pattern

...low cortisol.





49-year-old female
Low libido
Fatigue that worsens throughout the day

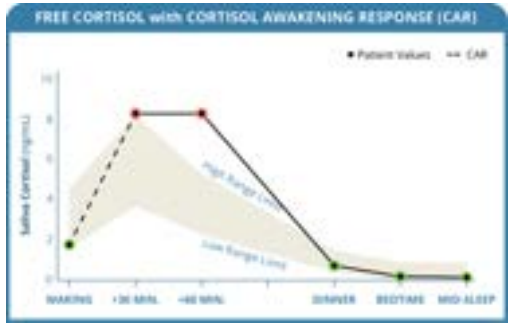
All images from http://canva.com

The DUTCH Dozen: 9 Free Cortisol Pattern

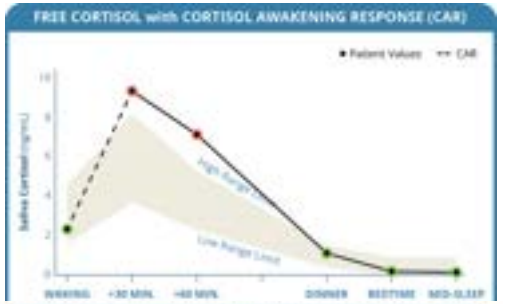
Note, however, that **high cortisol can last for YEARS**! This woman struggles with anxiety.

34-years-old

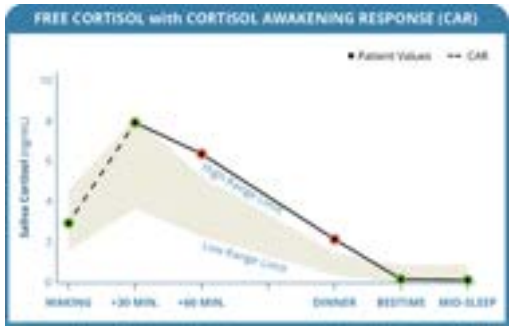
37-years-old



35-years-old



39-years-old



36-years-old

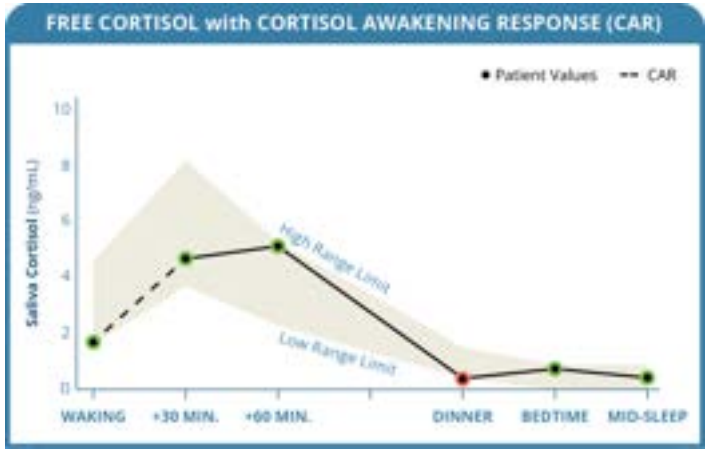
40-years-old

Here we may be seeing a shift to lower cortisol after years of chronic stress. Keep an eye on it!!!

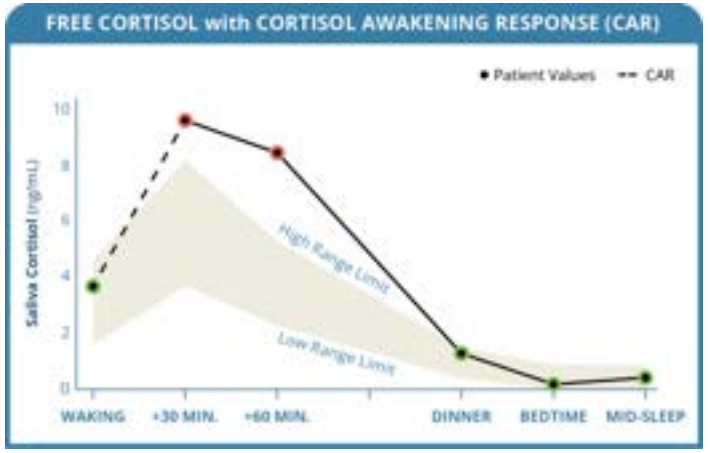
The DUTCH Dozen: 9 Free Cortisol Pattern

Also, age is *not* a contributor to low cortisol.

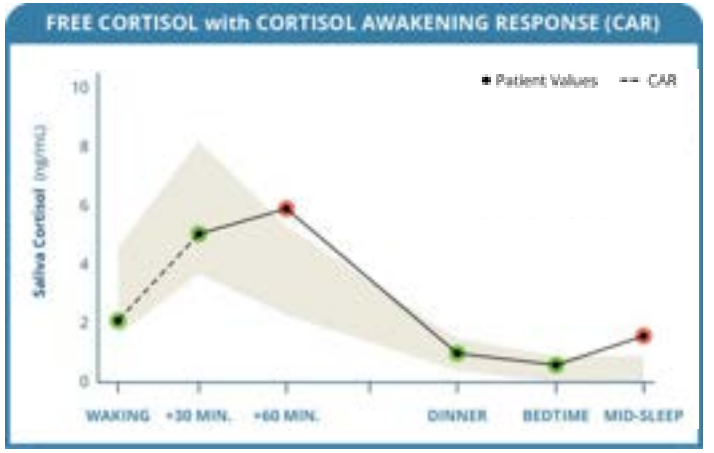
- DHEA levels go down over time as we age, but cortisol shouldn't!



86-year-old female
Top issue: low libido



82-year-old female
Top issue: overweight



91-year-old female
Top issues: hypertension, occasional dizziness, sleep issues

Cortisol in Men & Women: Causes

Low

Low Cortisol Due To:
- Burnout and prolonged stress
- Chronic sleep deprivation or untreated sleep apnea
- Chronic infection, pain, or inflammation
- Pituitary or hypothalamic dysfunction
- Medications that impair (but do not fully suppress) the HPA axis (e.g., glucocorticoids, opioids) (9)
- Traumatic brain injury, concussions, PTSD
- CAH / NCCAH (23)

Very Low

Very Low Cortisol Due To:
All of the above, typically more severe or prolonged, and/or:
- Pituitary or hypothalamic suppression
- Medications that suppress the HPA axis (e.g., higher-dose or prolonged glucocorticoids, opioids) (9)
- Adrenal insufficiency, including Addison's disease

Normal

Habits That Promote Healthy Cortisol Levels:
- Practicing effective stress management
- Maintaining a consistent sleep schedule with adequate, restorative sleep
- Eating regular, balanced meals to support stable blood sugar
- Getting morning light exposure and limiting late-night light
- Engaging in regular, moderate physical activity (avoiding chronic overtraining)
- Prioritizing recovery, rest days, and downtime
- Supporting immune health through nutrition and illness recovery
- Maintaining emotional regulation and psychological resilience
- Limiting excessive caffeine and alcohol intake
- Building predictable daily routines to support circadian rhythm

High

High Cortisol Due To:
- Acute psychological stress
- Blood sugar dysregulation
- Acute inflammation
- Acute pain
- Acute infection or illness
- Elevated blood pressure
- Caffeine and other stimulants
- Cushing's syndrome
- Oral or systemic hydrocortisone use
- Strenuous or excessive exercise

Very High

Very High Cortisol Due To:
- Extreme acute psychological stress
- Acute inflammation
- Acute pain
- Acute infection or illness
- Cushing's syndrome
- Oral or systemic hydrocortisone use

Oral hydrocortisone supplementation:
It is important that you know when the patient last took their hydrocortisone therapy to properly interpret the results. Urinary Free Cortisol and Free Cortisone will likely be elevated for 4-6 hours after supplementation and urinary Metabolized Cortisol will likely be elevated for 10-12 hours after supplementation. Samples collected more than 10-12 hours after supplementation should be considered baseline (non-supplementing) values. Be aware that cortisol metabolites will lag behind free cortisol levels, so elevations in cortisol metabolites may be due to supplementation that is no longer affecting free cortisol levels if taken the morning of the test.

Cortisol in Men & Women: Effects

Low

Low Cortisol Levels May Lead To:

- Persistent fatigue and burnout
- Low mood or depression
- Reduced motivation and drive
- Low libido
- Sleep issues
- Low blood pressure
- Dizziness or lightheadedness
- Weakness or fainting
- Poor exercise tolerance
- Impaired cardiovascular and immune function

Normal

Healthy Levels of Cortisol Support:

- Stable energy throughout the day
- Normal stress resilience and emotional regulation
- Restful, restorative sleep with a normal circadian rhythm
- Healthy blood sugar regulation
- Normal blood pressure and cardiovascular support
- Appropriate immune and inflammatory responses
- Clear thinking, focus, and memory
- Balanced mood and motivation
- Normal metabolism and weight regulation
- Healthy response to illness, injury, and physical exertion

High

High Cortisol Levels May Lead To:

- Anxiety, panic attacks, or depression
- Insomnia or non-restorative sleep
- Weight gain, particularly central (abdominal) fat
- Brain fog and memory difficulties
- Increased inflammation
- Blood sugar and insulin dysregulation
- High blood pressure
- Hair thinning or loss
- Digestive complaints
- Reduced bone mineral density

The DUTCH Dozen

Free Cortisol Pattern &
24 Hour Free Cortisol

9

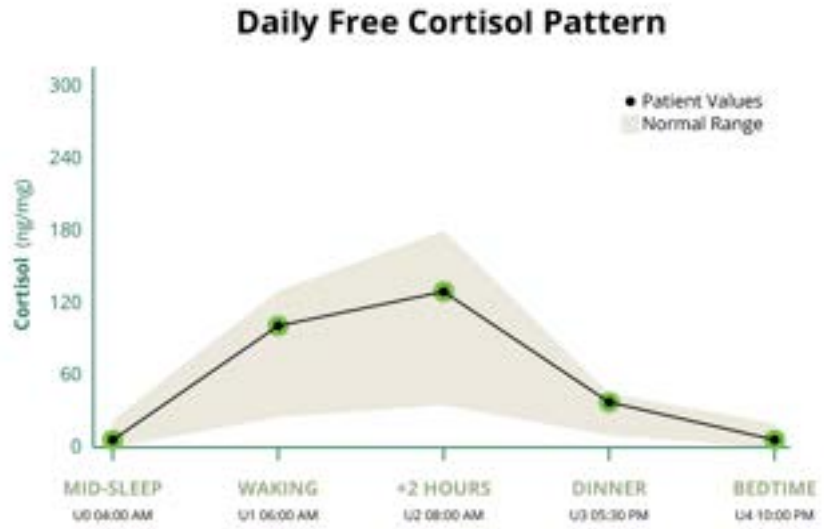
10

Cortisol

9 Assess the daily free cortisol pattern

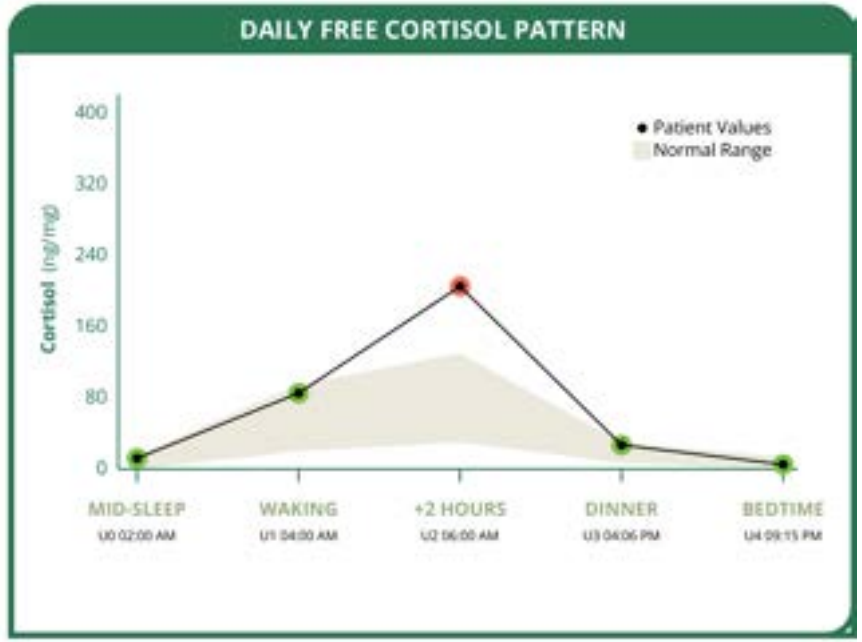
10 Assess the daily total of free cortisol in circulation (24hr Free Cortisol)

- The **ninth assessment** analyzes the **Daily Free Cortisol Pattern**.
- The **tenth assessment** measures the total daily free cortisol in circulation **(24 Hour Free Cortisol).**



The DUTCH Dozen: Free Cortisol Pattern & 24-Hour Free Cortisol

- The **Daily Free Cortisol Pattern** is plotted from urine or salivary samples collected throughout the day.
- This pattern helps identify **disruptions in the diurnal cortisol rhythm**, which can affect energy, sleep, the stress response, and more.
- •The **24-Hour Free Cortisol** is calculated by adding up the four urinary (or five salivary) free cortisol points on the graph.
- •It is the best marker to assess **overall tissue exposure to cortisol** on the day of testing.



24 Hour Free Cortisol

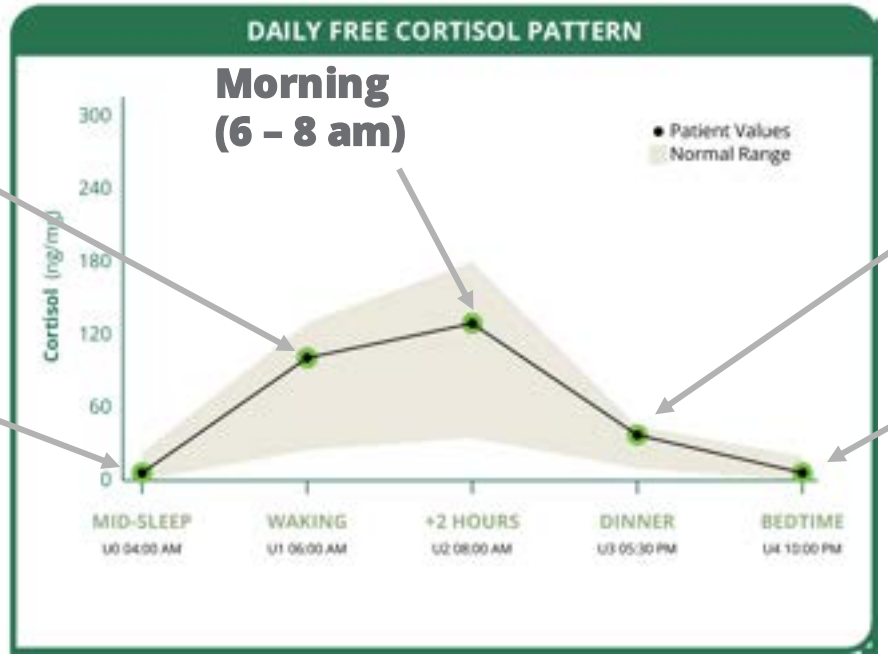
Sum of all Values

What does urine cortisol reflect?

Because it takes time for urine to collect in the bladder, **urine reflects average cortisol levels during the hours prior to collection.**

Early morning before waking
(4– 6 am)

Overnight
(10 pm – 4 am)



Afternoon
~3:30 – 5:30 pm

Bedtime
~8 - 10 pm

DUTCH Complete (***urine cortisol***)

Join at slido.com
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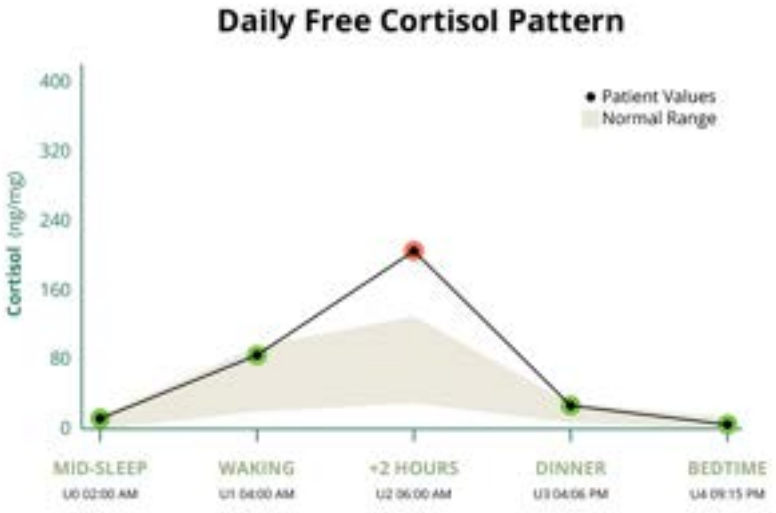
Polling Question

Game time!

These patients have the same 24-Hour Free Cortisol result.

Would you use the same HPA axis treatment plan for all three patients?

A



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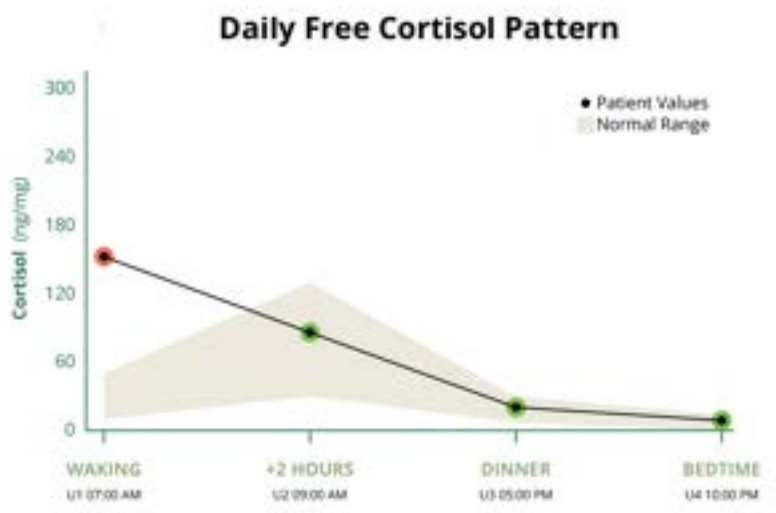

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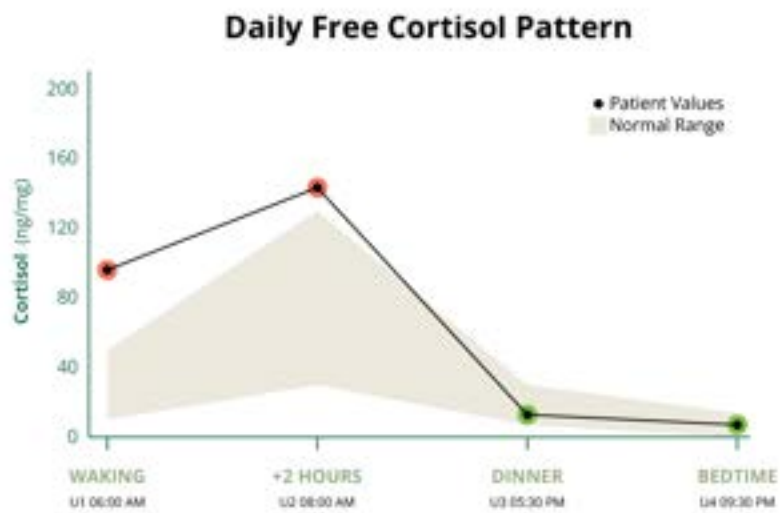


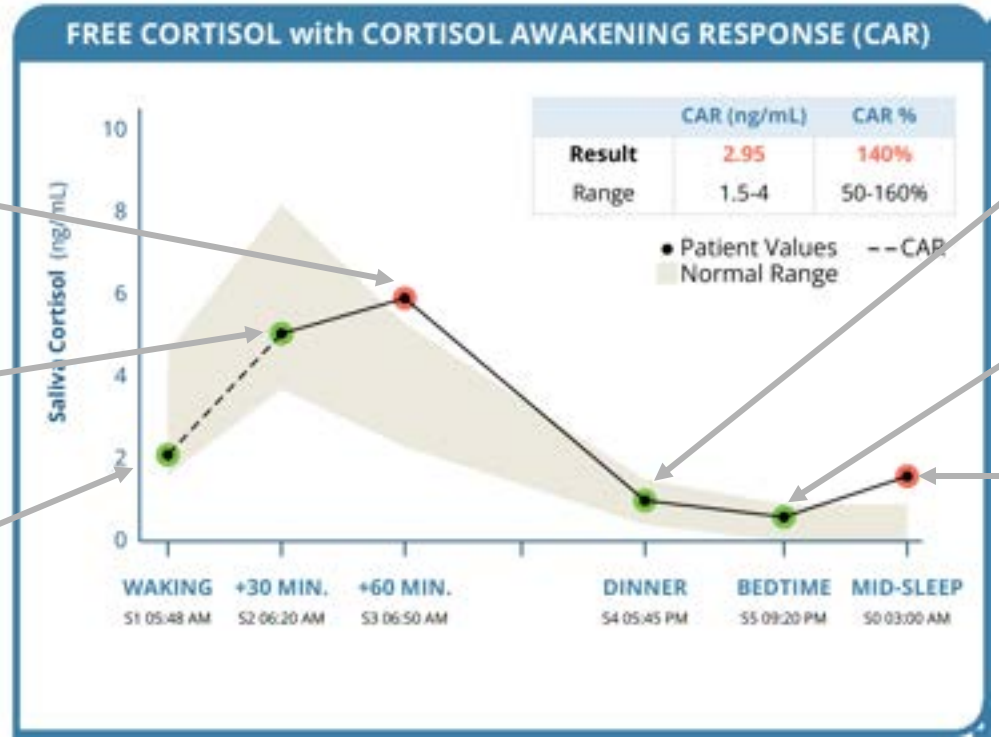
Question 1: These patients have the same 24-Hour Free Cortisol result. Would you use the same HPA axis treatment plan for all three patients?

Saliva reflects cortisol levels at the moment of collection.

Cortisol right at 60 minutes after waking (6:50 am)

Cortisol right at 30 minutes after waking (6:20 am)

Cortisol right upon Waking (5:48 am)



Cortisol right at dinnertime (5:45 pm)

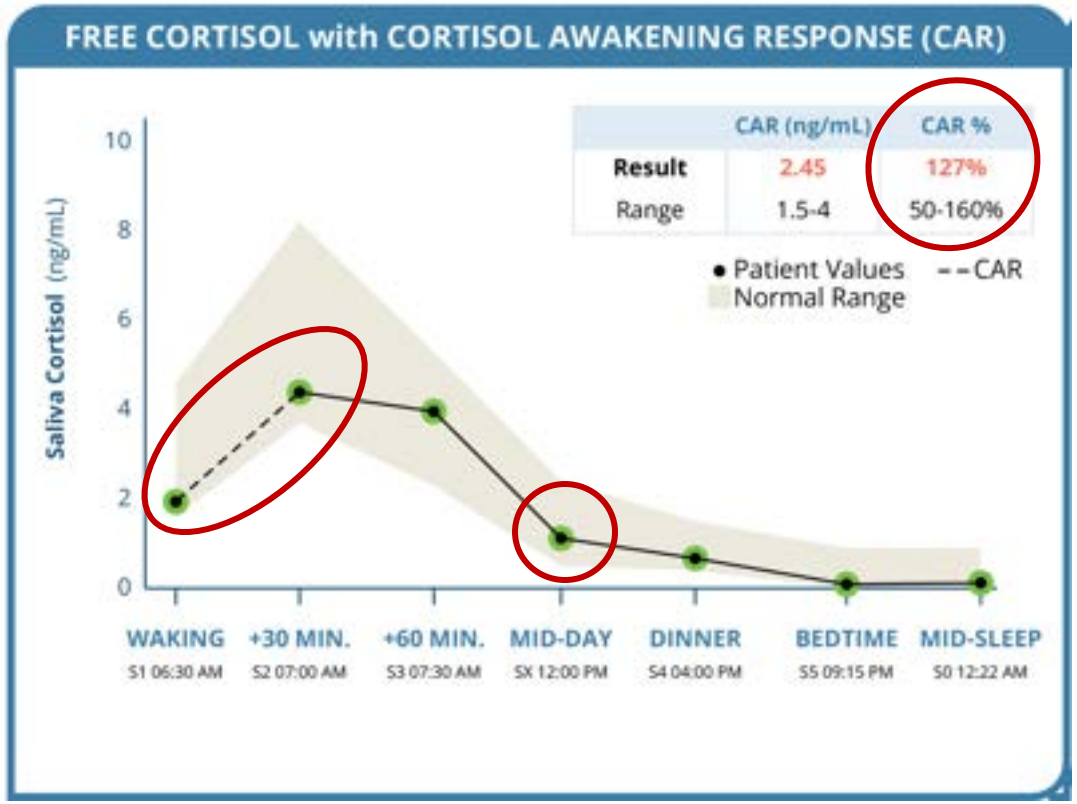
Cortisol right at bedtime (9:20 pm)

Cortisol right at mid-sleep waking (3 am)

DUTCH Plus (***salivary cortisol***)

The DUTCH Dozen: Free Cortisol Pattern & 24-Hour Free Cortisol

Therefore, with saliva you can assess the **Cortisol Awakening Response (CAR)**!



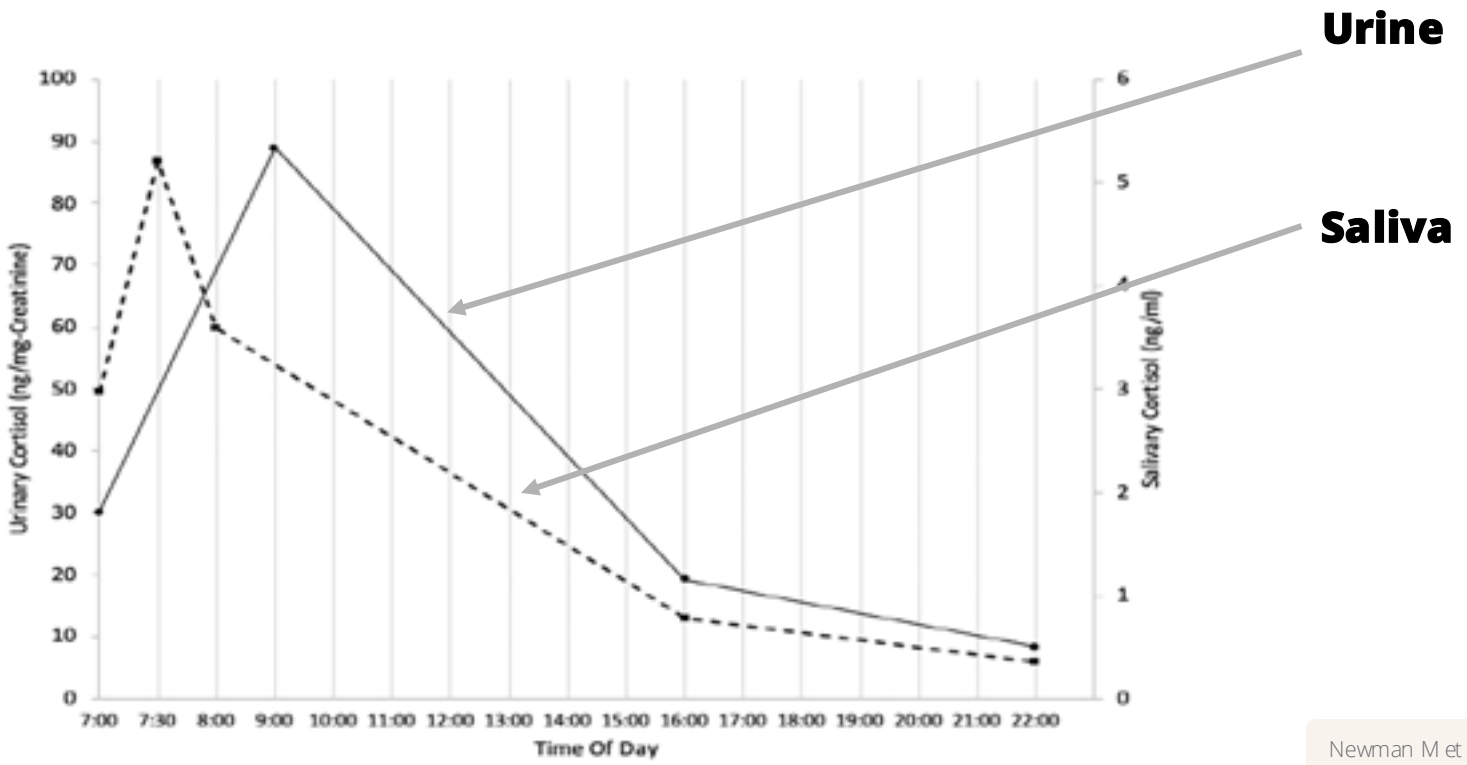
- The CAR is measured as the percent difference between the waking and 30-minute free cortisol.
- In healthy adults (assuming the test is timed correctly) the magnitude of the CAR was found to range between 50-160% or a rise of 1.5-4.0ng/mL.
- It estimates a person's HPA axis resiliency and their ability to cope with stress
  - **Low CAR** = under-response to stress
  - **High CAR** = over-response to stress (though could be a normal response to high levels of anticipatory stress)
- May be helpful for patients with sleep issues, mood issues, stressful lifestyles, fatigue, symptoms present in the mornings, etc.

BONUS: you can now collect a **MID-DAY** saliva sample with the DUTCH Plus or DUTCH CAR panels!

The DUTCH Dozen: Free Cortisol Pattern & 24-Hour Free Cortisol

Do diurnal changes in **salivary** cortisol correlate with **urinary** cortisol?

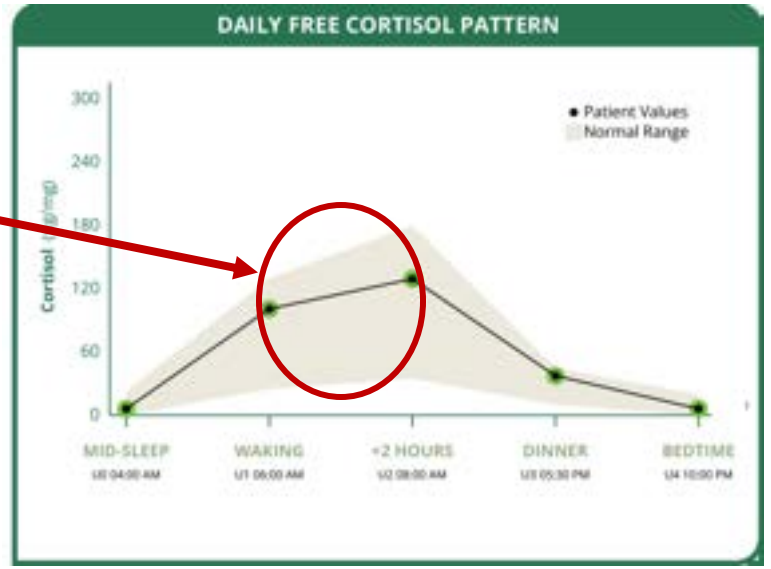
- In DUTCH's 2020 published study, a mixed model revealed **no difference** in the pattern of change over the day between the two measures (p =0.83).



Newman M et al. BMC Chem. 2021 Mar 15;15(1):18.

Ideally, the cortisol curve will follow a diurnal pattern.

- Meaning, that as the sun comes up, cortisol rises, and as the sun sets, cortisol declines.
- Most of free cortisol's release should occur in the morning.
- Spikes at other times during the day indicate an abnormal stress response.



So, what if the cortisol curve doesn't follow a diurnal pattern?!

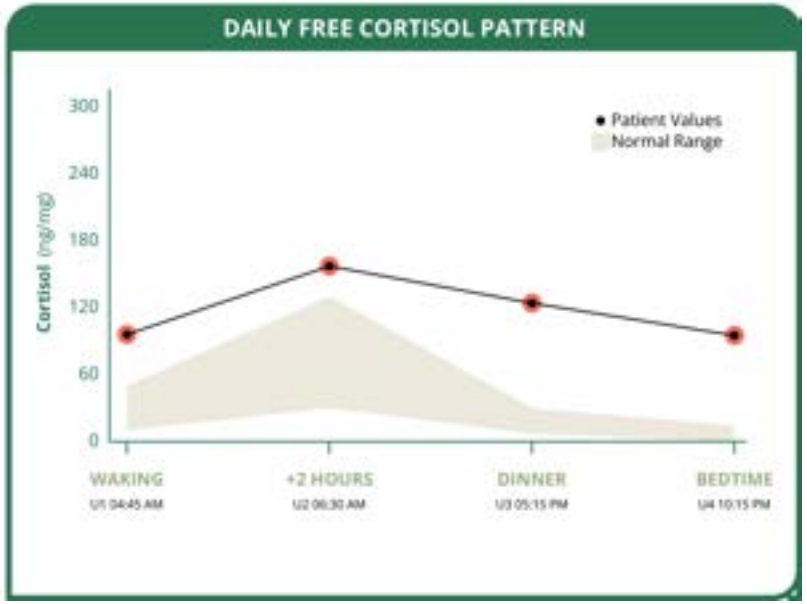
High cortisol (or exogenous glucocorticoid) disease states:

- **Cushing's Syndrome**
  - Exogenous
    - The most common type; caused by use of high-dose glucocorticoid medications.
  - Cushing's Disease
    - An ACTH-producing tumor in the pituitary gland that causes excess ACTH.
  - Ectopic
    - An ACTH-producing tumor outside the pituitary gland that causes excess ACTH.
  - Adrenal tumors
    - A tumor (benign or cancerous) in one or both adrenal glands that produces cortisol directly.

The DUTCH Dozen: Free Cortisol Pattern & 24-Hour Free Cortisol

- On the DUTCH test, when patients have **Cushing's syndrome** (excluding exogenous):
  - Free cortisol and cortisone are ***very* high with no diurnal pattern.**
  - Metabolized cortisol is above range.
  - Many times, the bedtime cortisol is 4x the upper limit of the reference range.

Cushing's Disease suspected in a 51-year-old woman



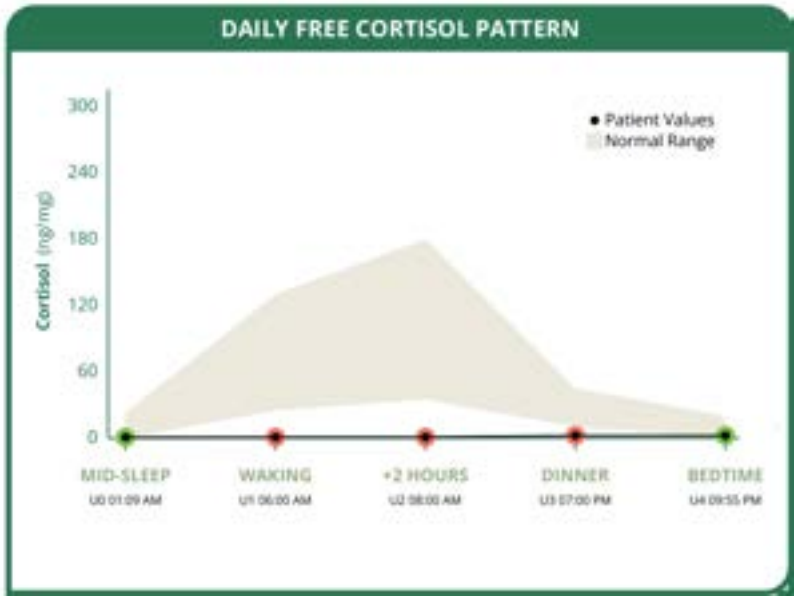
Low cortisol disease states:

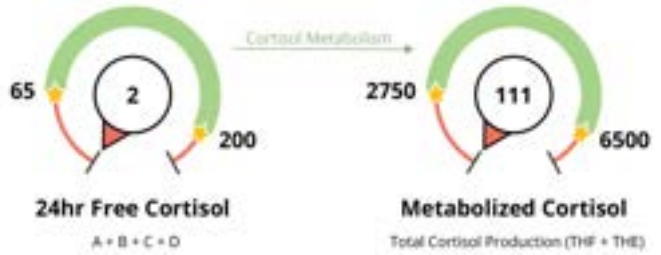
- **Adrenal Insufficiency**
  - Primary
    - Addison's disease: autoimmune disease of the adrenal glands resulting in too little production of cortisol and aldosterone.
  - Secondary
    - The pituitary gland fails to produce enough adrenocorticotropic hormone (ACTH).
  - Tertiary
    - The hypothalamus fails to produce corticotropin-releasing hormone (CRH).

The DUTCH Dozen: Free Cortisol Pattern & 24-Hour Free Cortisol

- On the DUTCH Test when patients have **adrenal insufficiency**:
  - Free cortisol and cortisone are ***very*** low and flat-lined with no diurnal pattern.
  - Metabolized cortisol is typically <500 ng/mg.

Addison's Disease diagnosed in a 55-year-old woman





Note:
- This pattern more commonly appears with **glucocorticoid use**.
- The degree of HPA axis suppression depends on dose, frequency, and timing

Although low and high cortisol disease states exist, **generalized HPA axis dysfunction** is what more commonly occurs.

For example, cortisol may elevate due to...

Rushing to get ready for work

Morning commute that provoked road rage.

Woke up feeling sick with headache and sore throat

Child starts throwing up EVERYWHERE with ***norovirus*** :/

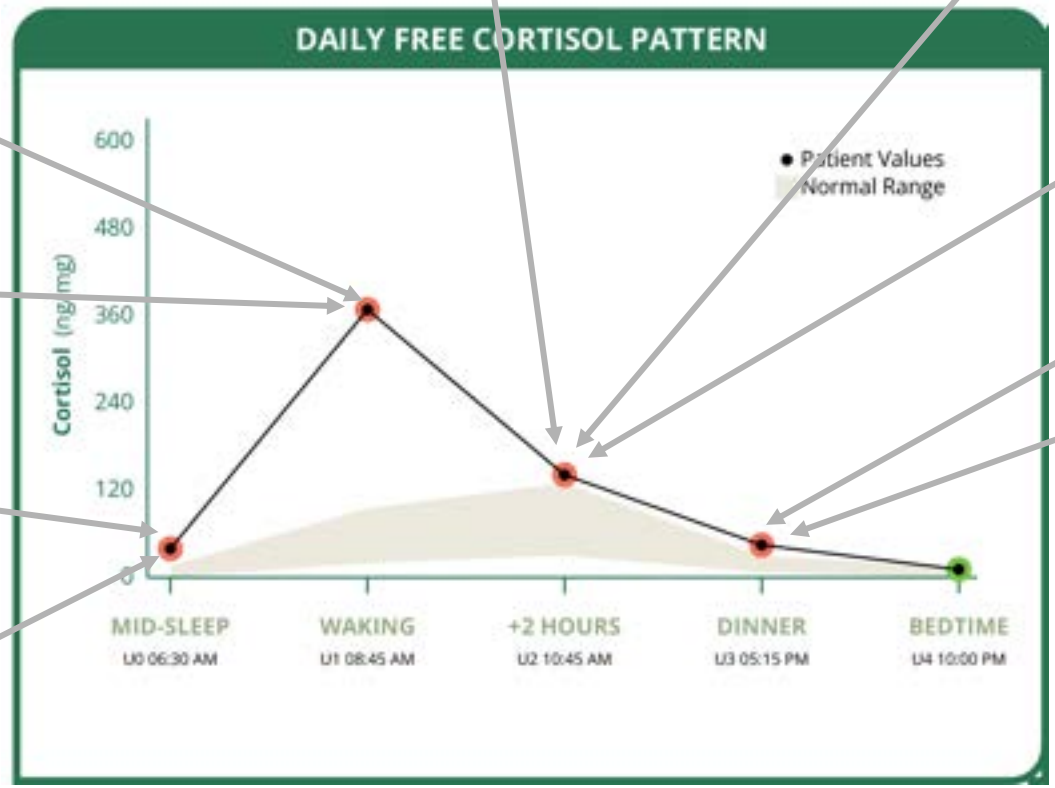
Difficulty falling back asleep after 4 am waking

Strenuous afternoon workout

Grease fire while cooking!

Had too many drinks that night

Tossing and turning because stressed about a big work presentation



Join at slido.com
#DUTCHFEST3

Polling Question

slido.com
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Game time!

Match the description to the graph:

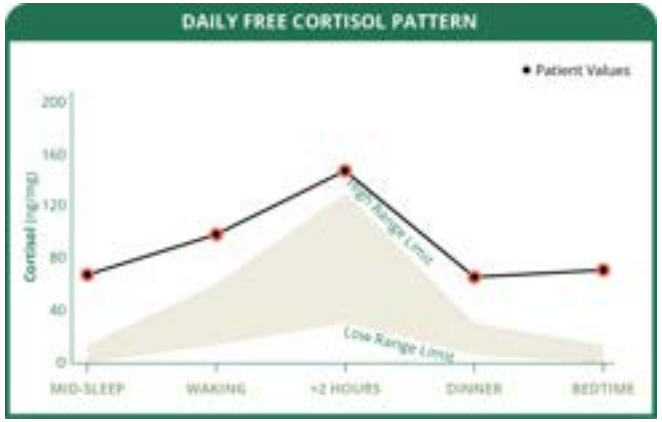
1

65-year-old female
Severe pain x 5 years
Dexamethasone 2 months prior
Currently taking Morphine fast acting and ER

2

35-year-old female
"I had a fever and was on Tylenol while taking these samples"
Covid positive

A



B

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Question 2: Match the description to the correct Daily Free Cortisol Pattern

Polling Question

Game time!

Match the description to the graph:

1

65-year-old female
Severe pain x 5 years
Dexamethasone 2 months prior
Currently taking Morphine fast acting and ER

A

2

35-year-old female
"I had a fever and was on Tylenol while taking these samples"
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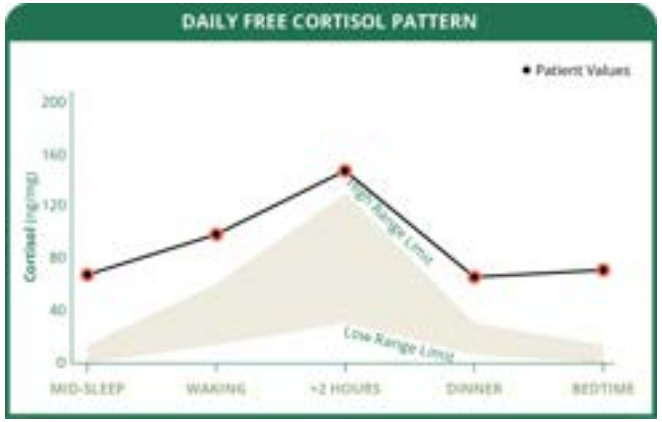

B

Polling Question

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Game time!

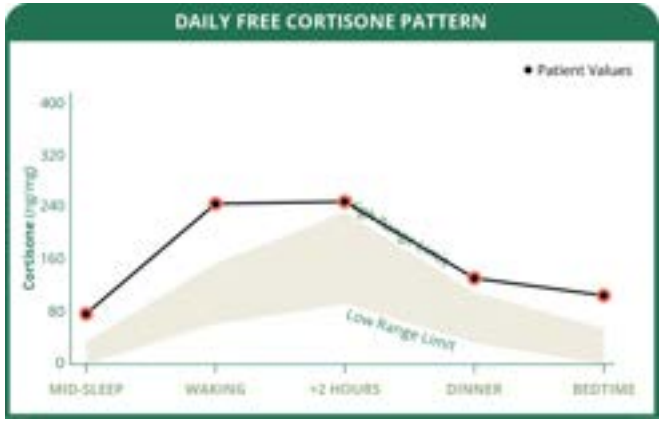
Match the description to the graph:

1

44-year-old female
"Due to no caffeine day of samples, I developed a severe headache/migraine" in the evening

2

31-year-old female
Going through divorce
Stress all day
"Drinking tequila every night"
Fasting glucose 98



A

B

dutch®

Question 3: Match the description to the correct Daily Free Cortisol Pattern

Polling Question

Game time!

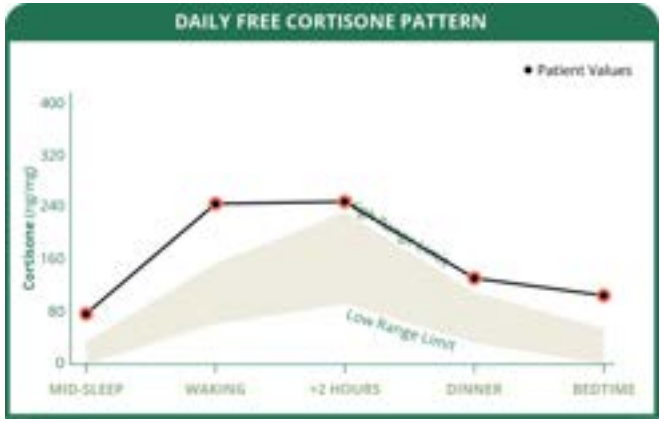
Match the description to the graph:

1

44-year-old female
"Due to no caffeine day of samples, I developed a severe headache/migraine" in the evening

2

31-year-old female
Going through divorce
Stress all day
"Drinking tequila every night"
Fasting glucose 98



A

B

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Polling Question

Game time!

Match the description to the graph:

slido.com
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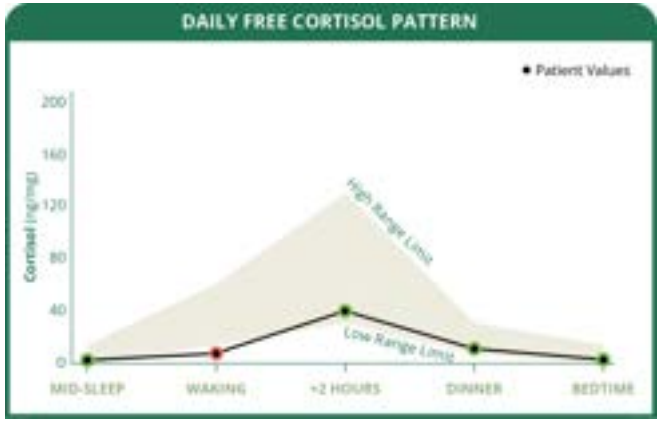
1

57-year-old female
Chronic Illness
Chronically high hs-CRP
Chronic anxiety/depression

2

54-year-old female
HIIT before bedtime
Some issues falling asleep but severe difficulty staying asleep

A



B

dutch

Question 4: Match the description to the correct Daily Free Cortisol Pattern

Polling Question

Game time!

Match the description to the graph:

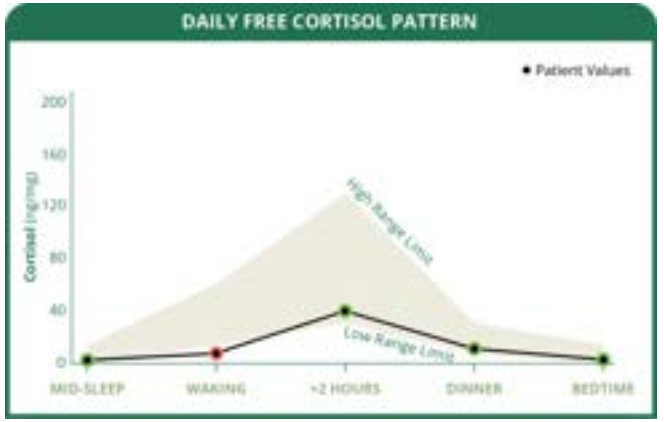
1

57-year-old female
Chronic Illness
Chronically high hs-CRP
Chronic anxiety/depression

2

54-year-old female
HIIT before bedtime
Some issues falling asleep but severe difficulty staying asleep

A



B

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Polling Question

Game time!

Match the description to the graph:

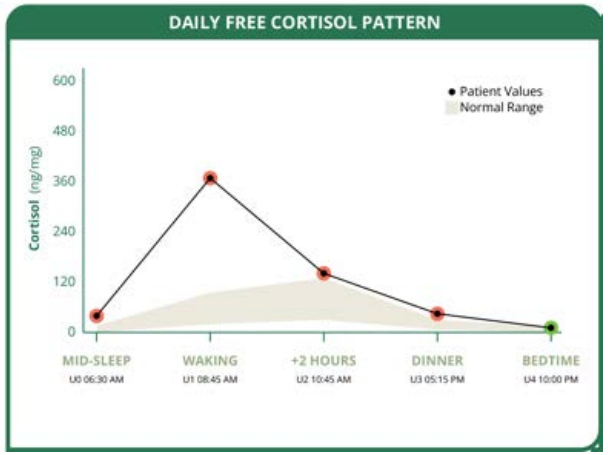
slido.com
#DUTCHFEST3

1

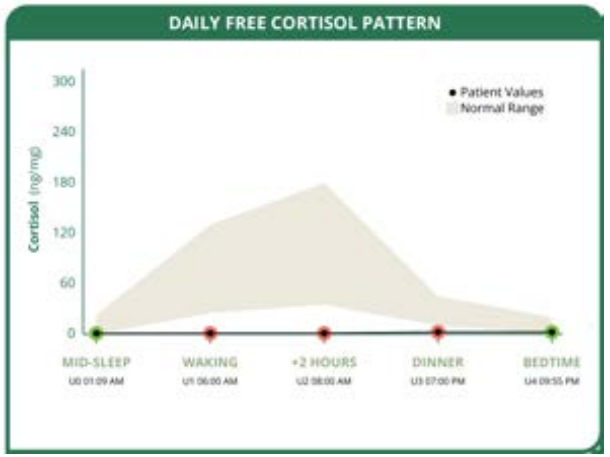
32-year-old female
Prescribed prednisone pack for rheumatoid arthritis flare-up Took 30 mg on testing day

2

55-year-old female
PMP
Addison's disease



A



B

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Question 5: Match the description to the correct Daily Free Cortisol Pattern

Polling Question

Game time!

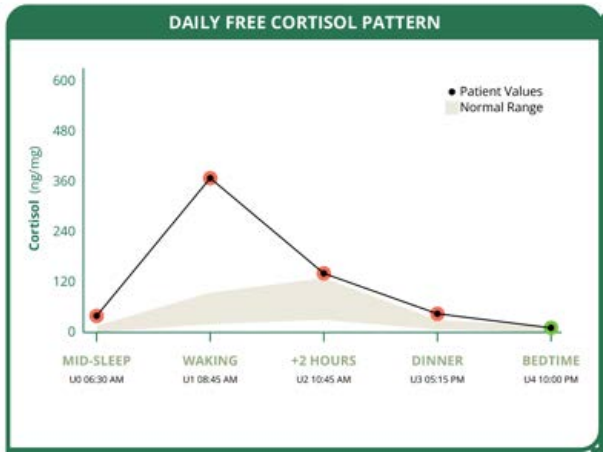
Match the description to the graph:

1

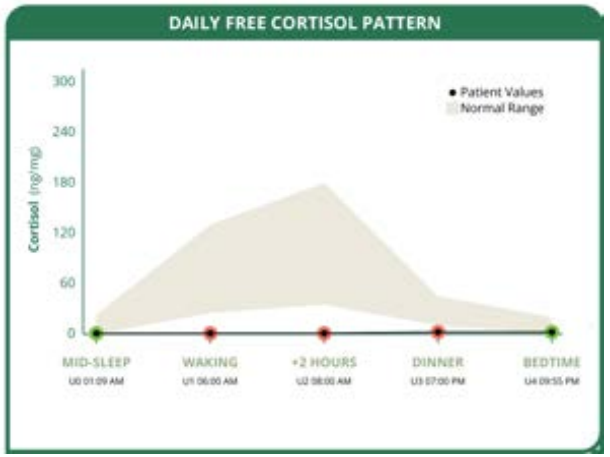
32-year-old female
Prescribed prednisone pack for rheumatoid arthritis flare-up Took 30 mg on testing day

2

55-year-old female
PMP
Addison's disease



A

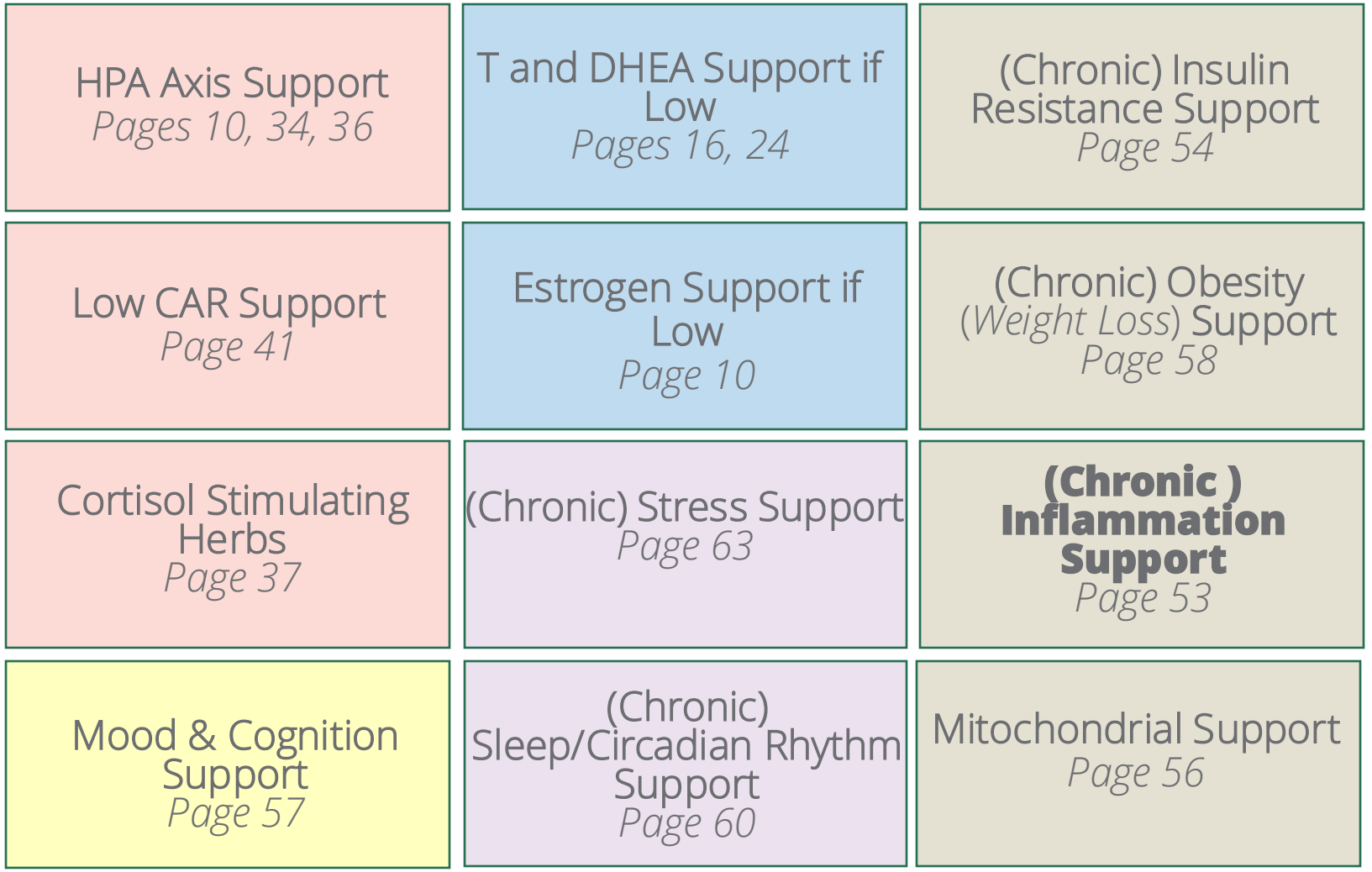


B

Cortisol Treatments

The treatment you choose depends on the cause, but also the symptoms, treatment goals, and patient preferences.

The DUTCH Treatment Guide: **Low Cortisol**



HPO Axis Support | HPA Axis Support | Other Hormone support | OATs Support | Symptom Support | Detox Support | Lifestyle Support | Other Support

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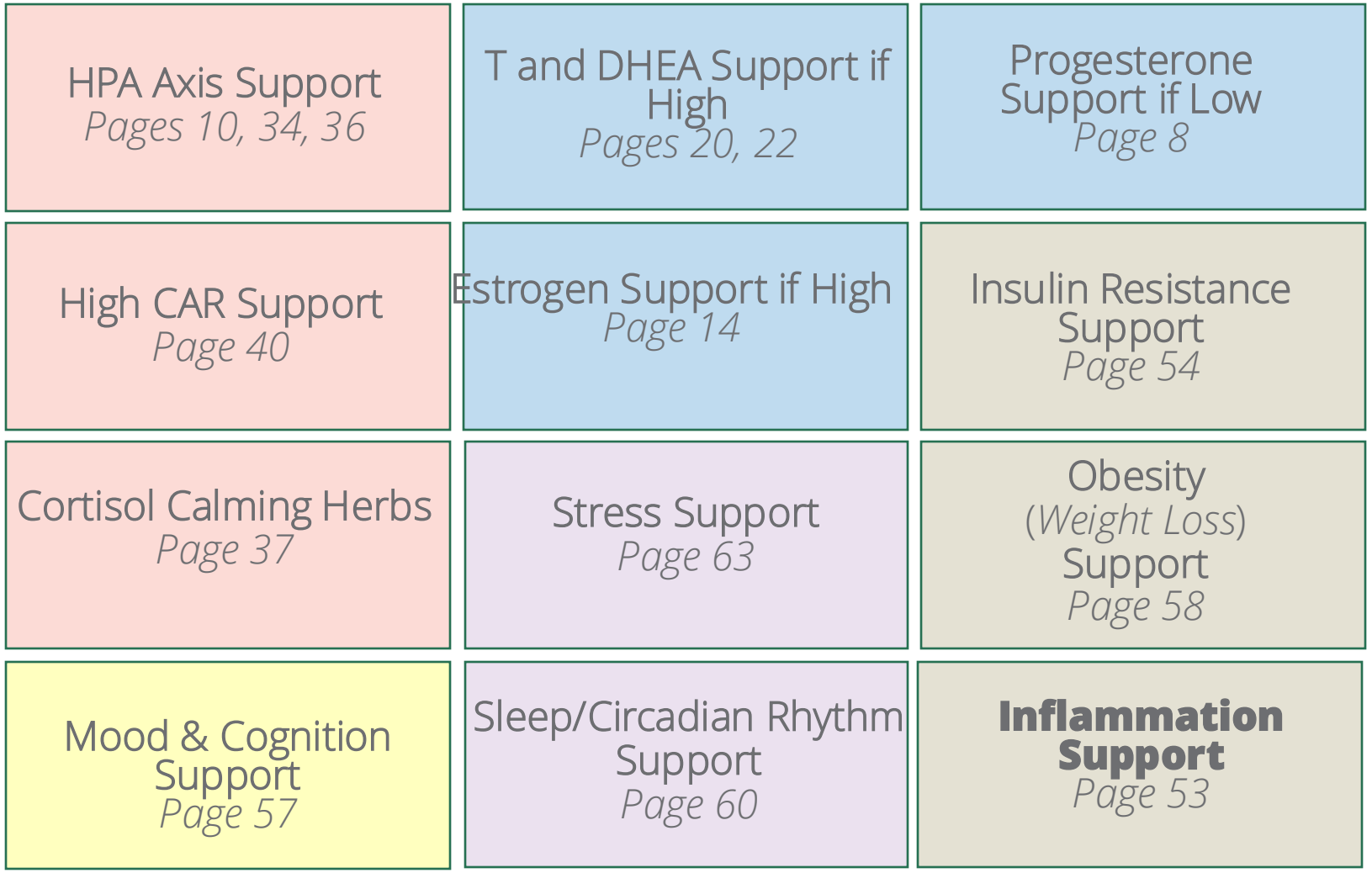
The DUTCH Treatment Guide: **High Cortisol**



HPO Axis Support | HPA Axis Support | Other Hormone support | OATs Support | Symptom Support | Detox Support | Lifestyle Support | Other Support

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The DUTCH Dozen

Metabolized Cortisol & Cortisol Clearance Rate

11

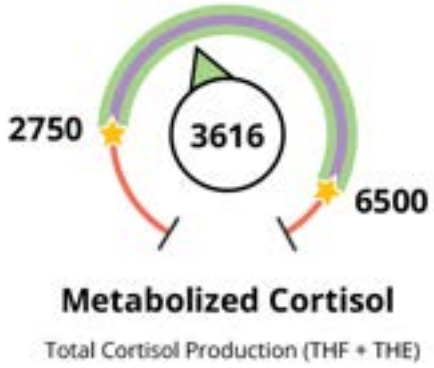
12

Cortisol

11 Assess the total cortisol produced by the adrenal glands (Metabolized Cortisol)

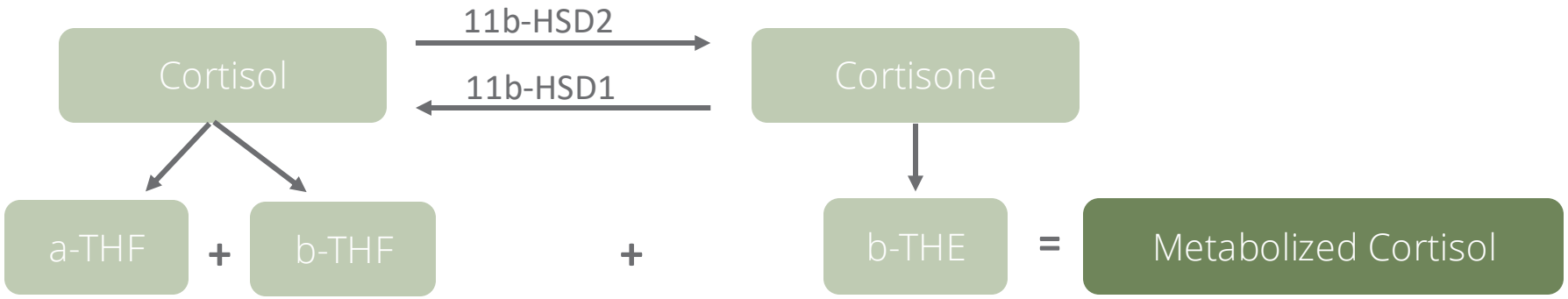
12 Assess the rate of cortisol clearance from the body

- The **eleventh assessment** evaluates **Metabolized Cortisol**, which reflects the adrenal glands' cortisol output for the day.
- The **twelve and final assessment** examines the **cortisol clearance rate (CCR)**.
- These offer a broader perspective on adrenal function than just a free cortisol diurnal test.



The DUTCH Dozen: Metabolized Cortisol & Cortisol Clearance Rate

- Metabolized Cortisol = The sum of cortisol metabolites: a-THF, b-THF, b-THE



The DUTCH Dozen: Metabolized Cortisol & Cortisol Clearance Rate

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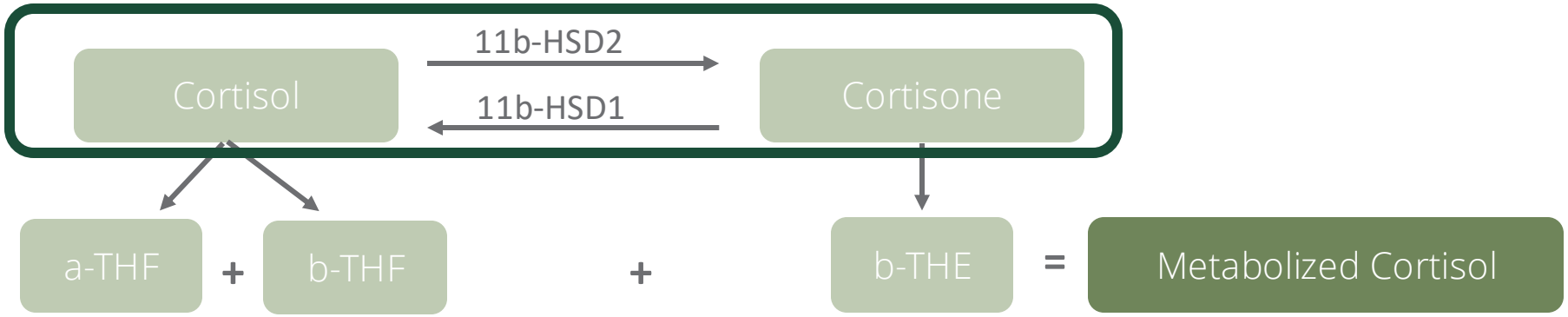
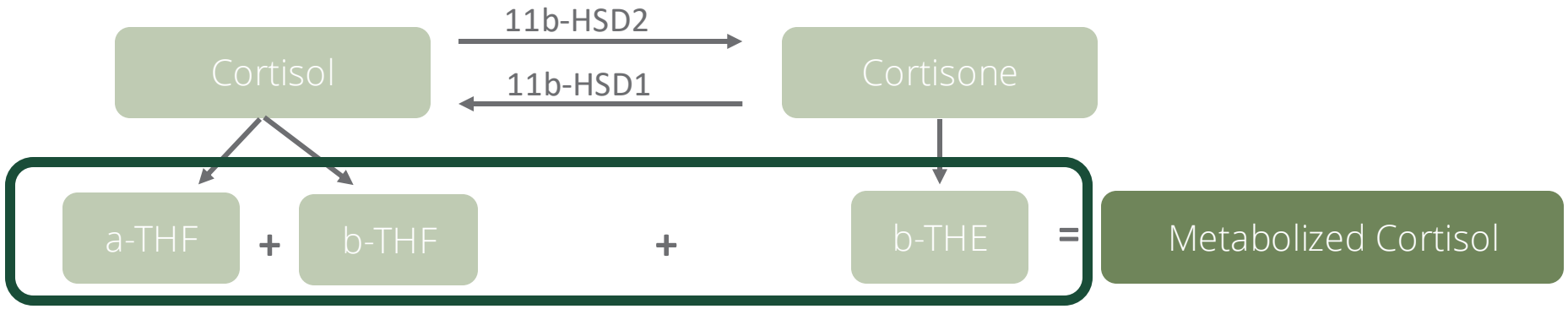


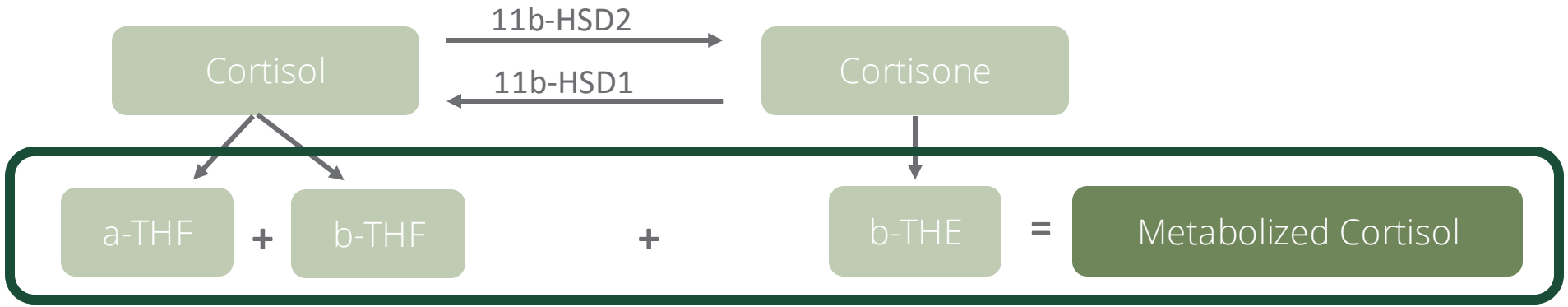
The DUTCH Dozen: Metabolized Cortisol & Cortisol Clearance Rate

- Metabolized Cortisol = The sum of cortisol metabolites: a-THF, b-THF, b-THE



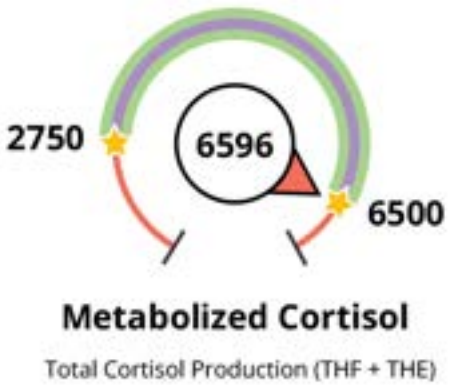
The DUTCH Dozen: Metabolized Cortisol & Cortisol Clearance Rate

- Metabolized Cortisol = The sum of cortisol metabolites: a-THF, b-THF, b-THE

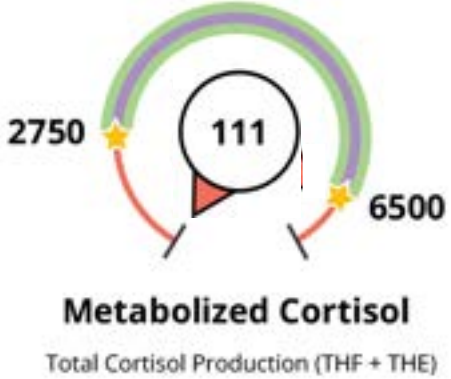


The DUTCH Dozen: Metabolized Cortisol & Cortisol Clearance Rate

- **Metabolized cortisol represents 80% of total cortisol production**, whereas free cortisol only represents 1%-5%
- Therefore, metabolized cortisol is a good indicator of the total amount of cortisol the adrenals made on **the day of testing.**



The adrenals **made a lot of cortisol**.



The adrenals **didn't make much cortisol.**

The DUTCH Dozen: Metabolized Cortisol & Cortisol Clearance Rate

Causes of Low Metabolized Cortisol

- Contributors of low cortisol production
- Slow cortisol clearance rate (**low CCR**)

- Low CCR *(slower clearance)* may cause cortisol to "back up" in circulation and lower ACTH signaling.

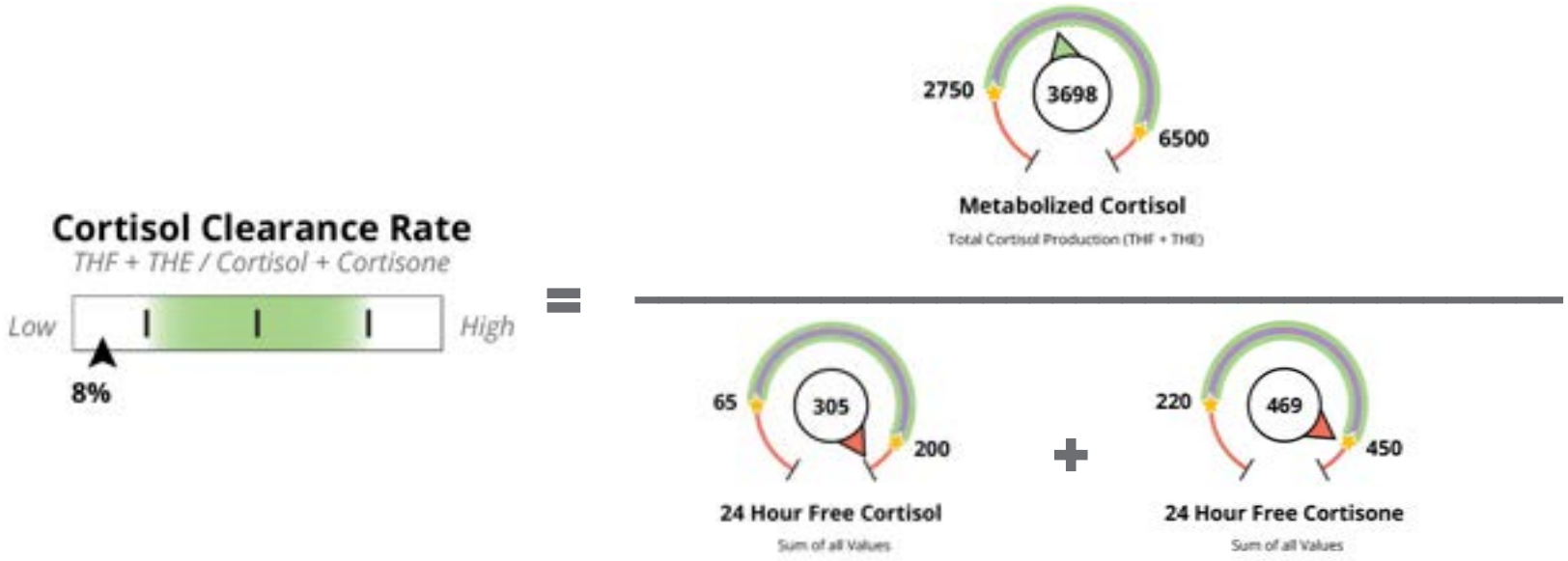
Causes of High Metabolized Cortisol

- Contributors of high cortisol production
- Fast cortisol clearance rate (**high CCR**)

- High CCR *(faster clearance)* causes cortisol to clear from in circulation faster and may increase ACTH signaling.

The DUTCH Dozen: Metabolized Cortisol & Cortisol Clearance Rate

- The **Cortisol clearance rate (CCR)** is calculated as the ratio of THF + THE (Metabolized Cortisol) to free cortisol + free cortisone.
- A low CCR (below 20%) indicates **slower** clearance, while a high CCR (above 80%) indicates **faster** clearance.
- Both extremes may point to **metabolic issues affecting the HPA axis**, requiring further evaluation.



The DUTCH Dozen: Metabolized Cortisol & Cortisol Clearance Rate

Low CCR Contributors

- **Top Considerations:**
- Hypothyroidism (or insufficient thyroid medication) specifically **low free T3**
- Liver/Gallbladder Stasis
- Anorexia/Orthorexia

High CCR Contributors

- **Top Considerations:**
- Obesity
- Insulin Resistance
- Hyperthyroidism (or too much thyroid medication)
- Fatty Liver
- Inflammation

See "References" at the end of the slide deck.

The DUTCH Dozen: Metabolized Cortisol & Cortisol Clearance Rate

CCR: There are 3 patterns:

1

Metabolized Cortisol

Free Cortisol

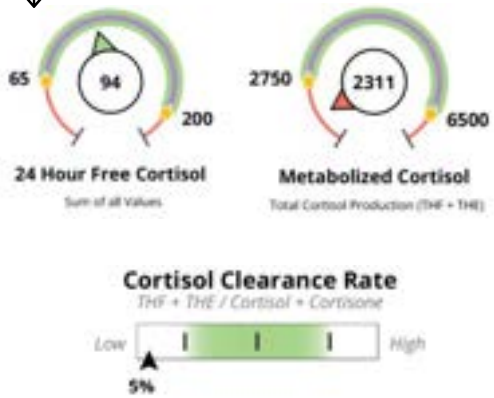
Normal clearance

2

Metabolized Cortisol

Free Cortisol

Slow clearance



3

Metabolized Cortisol

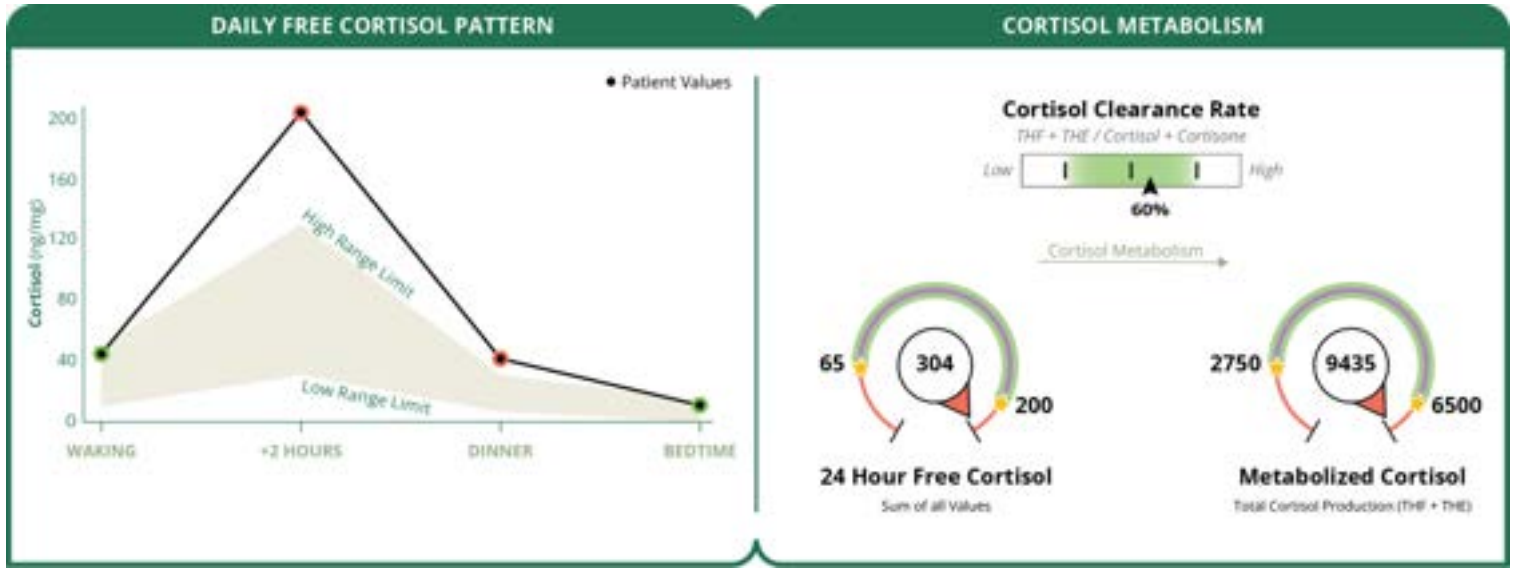
Free Cortisol

Fast clearance

The DUTCH Dozen: Metabolized Cortisol & Cortisol Clearance Rate

1 Pattern 1: Metabolized cortisol and 24-hour free cortisol ALIGN.

- Both high, thus **confirms high cortisol**. No clearance issues.



Metabolized Cortisol

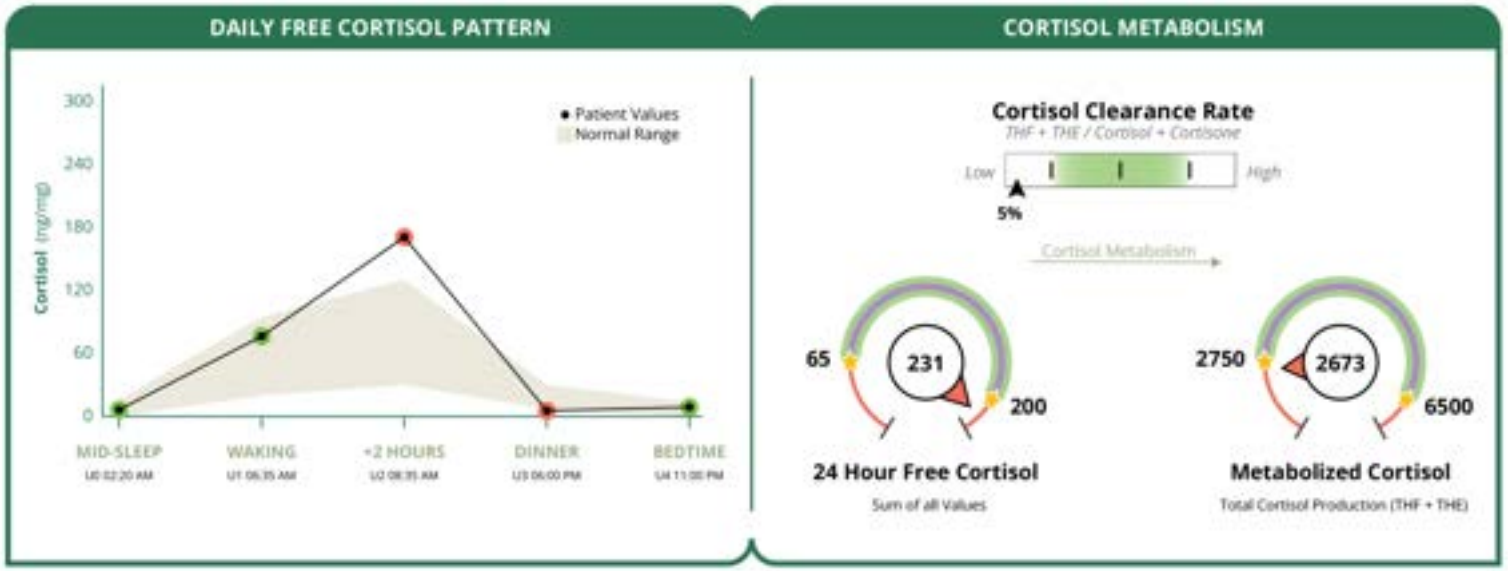
Free Cortisol

✓ **Normal clearance**

The DUTCH Dozen: Metabolized Cortisol & Cortisol Clearance Rate

2 Pattern 2: Metabolized cortisol is *relatively lower* than 24-hour free cortisol

- Indicates **sluggish cortisol clearance**



Metabolized Cortisol

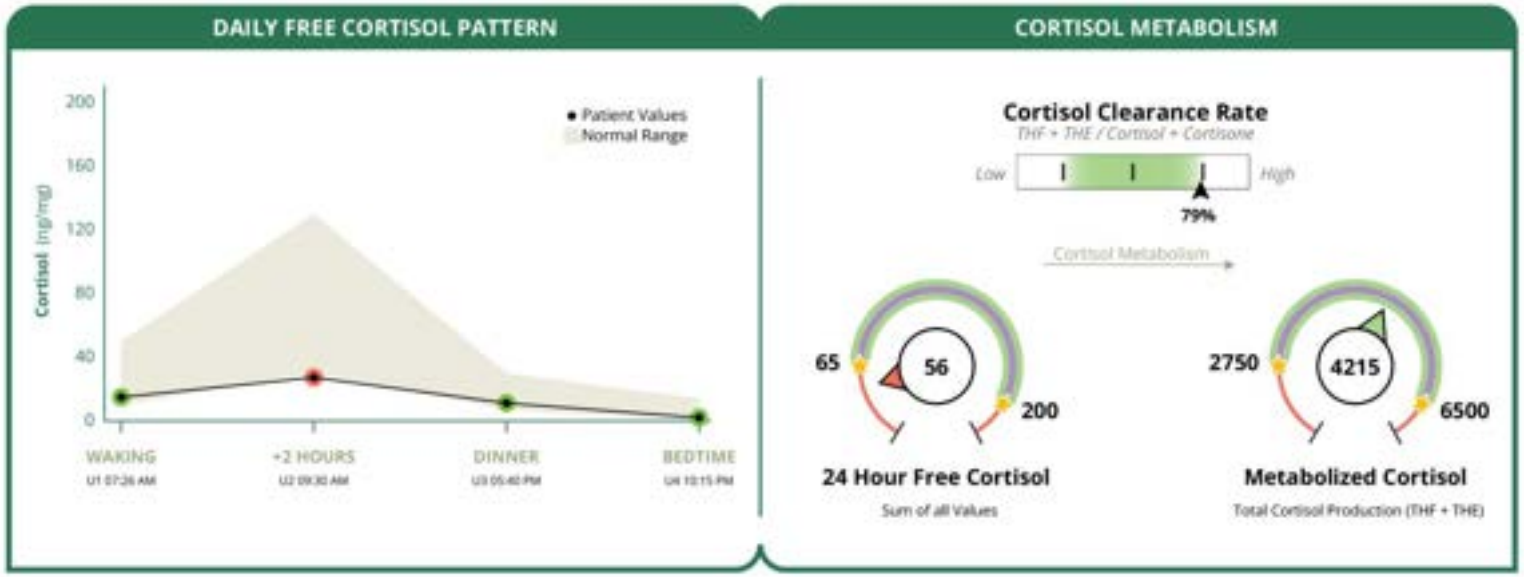
Free Cortisol

↓ **Slow clearance**

The DUTCH Dozen: Metabolized Cortisol & Cortisol Clearance Rate

3 **Pattern 3:** Metabolized cortisol is *relatively higher* than 24-hour free cortisol

- Indicates **fast cortisol clearance**



Metabolized Cortisol

Free Cortisol

↑ **Fast clearance**

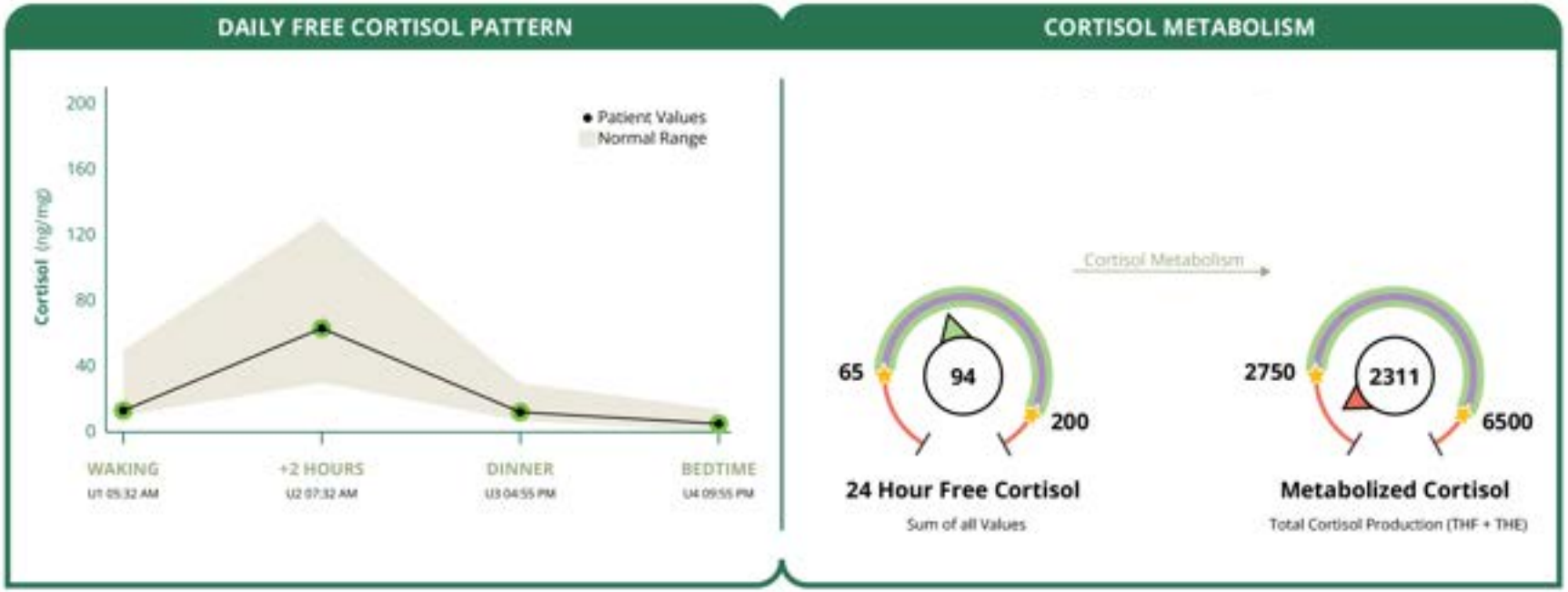
Join at slido.com
#DUTCHFEST3

Polling Question

Game time!

Is there a slow, normal, or fast CCR?

slido.com
#DUTCHFEST3

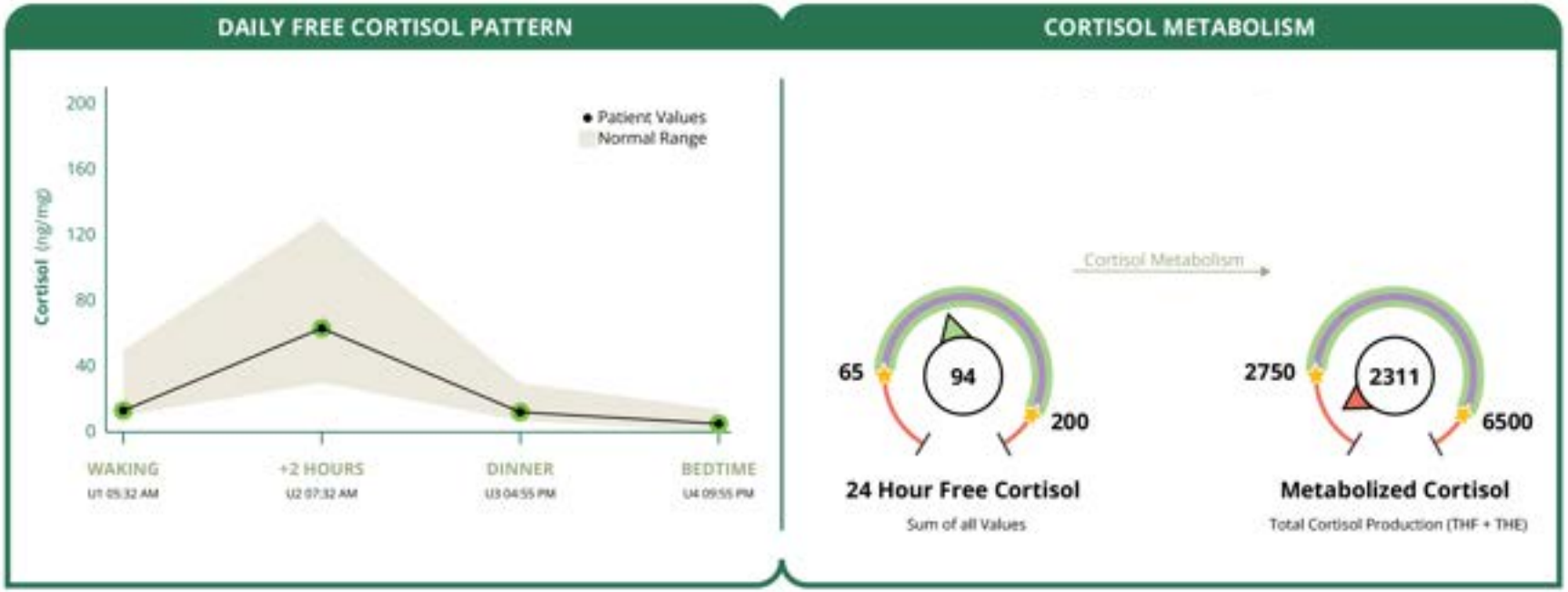


Question 6: Is there a slow, normal, or fast Cortisol Clearance Rate (CCR)?

Polling Question

Game time!

Is there a slow, normal, or fast CCR?



Metabolized Cortisol

Free Cortisol

Slow clearance

Polling Question

slido.com
#DUTCHFEST3

Game time!

(Problematic, actionable results)

Match the description to the CCR slider bar:

1

22-year-old female
Anorexia
BMI 21.3
Amenorrhea

A

2

49-year-old female
BMI 51.5
HbA1c 5.9
Fasting insulin 15

B

Question 7: Match the description to the correct Cortisol Clearance Rate slider

Polling Question

Game time!

(Problematic, actionable results)

Match the description to the CCR slider bar:

1

22-year-old female
Anorexia
BMI 21.3
Amenorrhea

A

2

49-year-old female
BMI 51.5
HbA1c 5.9
Fasting insulin 15

B

Polling Question

slido.com
#DUTCHFEST3

Game time!

(Problematic, actionable results)

Match the description to the CCR slider bar:

1

57-year-old female
BMI 22.5
"My thyroid is swollen"
Thyroid goiter due to hyperthyroidism

A

2

59-year-old female
Hypothyroidism
"Resistant to thyroid meds"

B

Question 8: Match the description to the correct Cortisol Clearance Rate slider

Polling Question

Game time!

(Problematic, actionable results)

Match the description to the CCR slider bar:

1

57-year-old female
BMI 22.5
"My thyroid is swollen"
Thyroid goiter due to hyperthyroidism

2

59-year-old female
Hypothyroidism
"Resistant to thyroid meds"

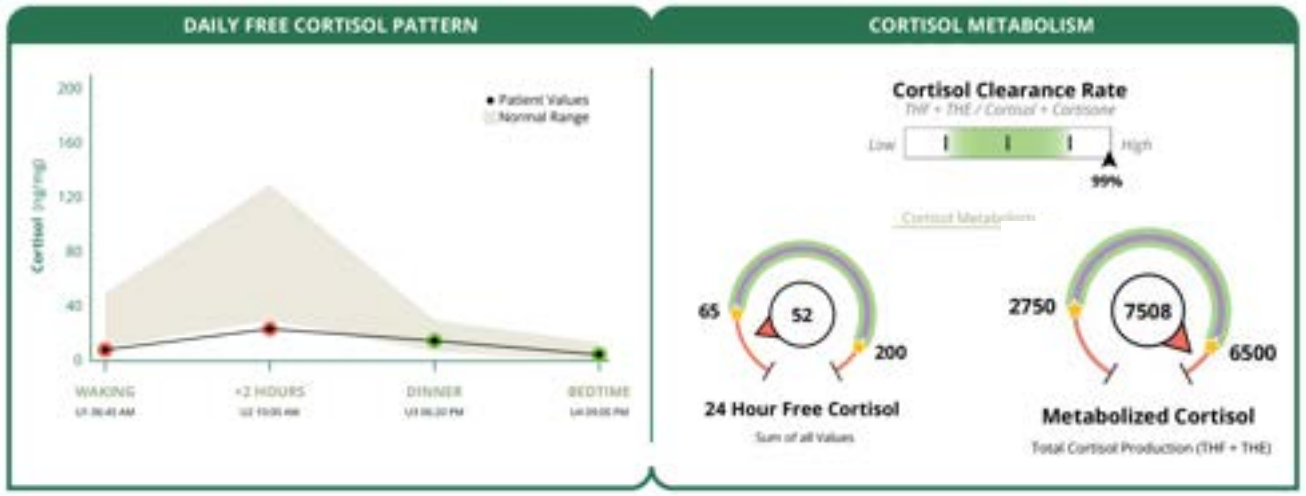
A

B

Polling Question

Game time!

Did this 69-year-old woman's adrenals make a low, normal, or high amount of cortisol on the day of testing?



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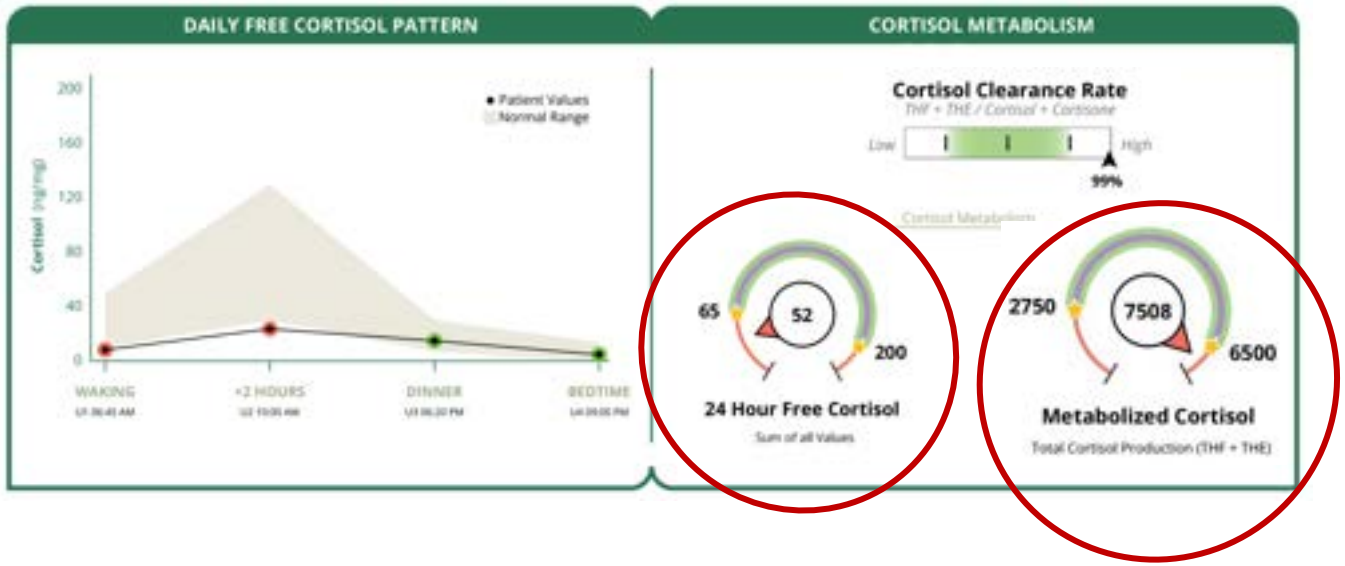
Question 9: Did this 69-year-old woman's adrenals make a low, normal, or high amount of cortisol on the day of testing?

Polling Question

Game time!

Did this 69-year-old woman's adrenals make a low, normal, or high amount of cortisol on the day of testing?



Her adrenals made a *high amount of cortisol!*

- What was ***made*** does not always match with what is still in ***circulation***.
- In this case, the patient has a high BMI (31.1). Increased fat tissue causes free cortisol to be cleared from circulation (***usually into the fat tissue***) at a faster rate (CCR = 99%).
- **Her issue is NOT low cortisol production.**
- Oral hydrocortisone may be less effective for treating her fatigue, as she'd clear it quickly. Focusing on weight loss, blood sugar regulation, reducing inflammation, etc. may be more helpful than cortisol stimulating treatments.

CCR Treatments

The treatment you choose depends on the cause, but also the symptoms, treatment goals, and patient preferences.

The DUTCH Treatment Guide: **Cortisol Clearance Rate (CCR)**

Slow CCR

- Treat Hypothyroidism *Page 52*
- Support Liver/Gallbladder *Page 41*
- Treat Anorexia

Fast CCR

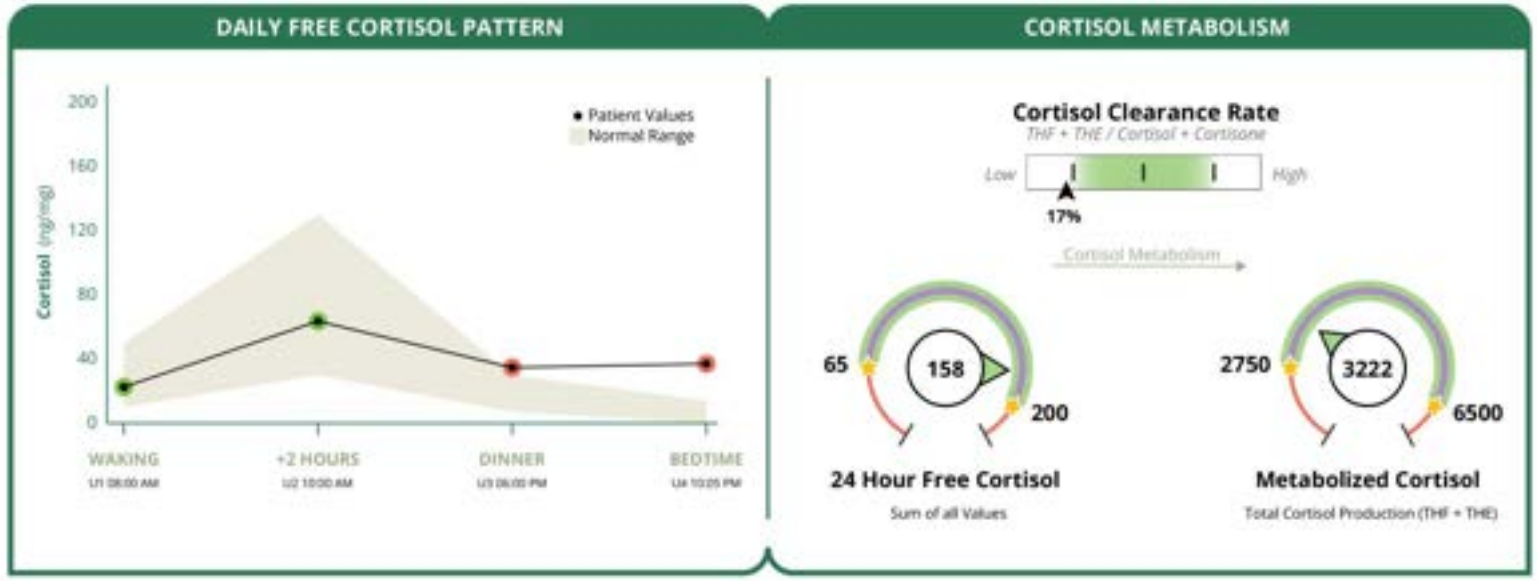
- Insulin Resistance Support *Page 54*
- Obesity (*Weight Loss*) Support *Page 58*
- Inflammation Support *Page 53*
- Treat Hyperthyroidism Fatty Liver

HPO Axis Support · HPA Axis Support · Other Hormone support · OATs Support · Symptom Support · Detox Support · Lifestyle Support · Other Support

Putting it All Together!

The DUTCH Dozen: Putting it all together!

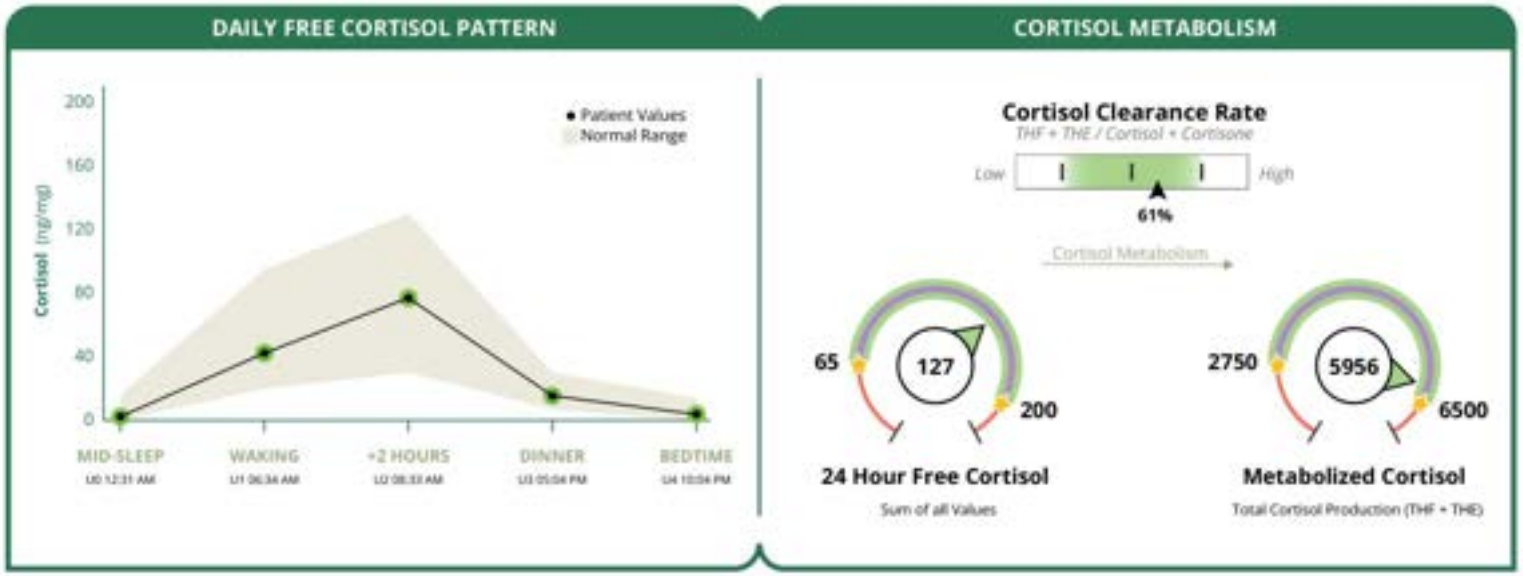
- **24-year-old female** diagnosed with Premature Ovarian Insufficiency (POI). Complains of fatigue, low libido, and stressful roommate situation (doesn't like to be home). BMI 21.3.



- Does her high DINNER and BEDTIME free cortisol signify that her cortisol was elevated at that moment in time when she collected her urine samples (6:00 pm and 10:05 pm, respectively)?
- What might you investigate after seeing her low CCR (17%)?

The DUTCH Dozen: Putting it all together!

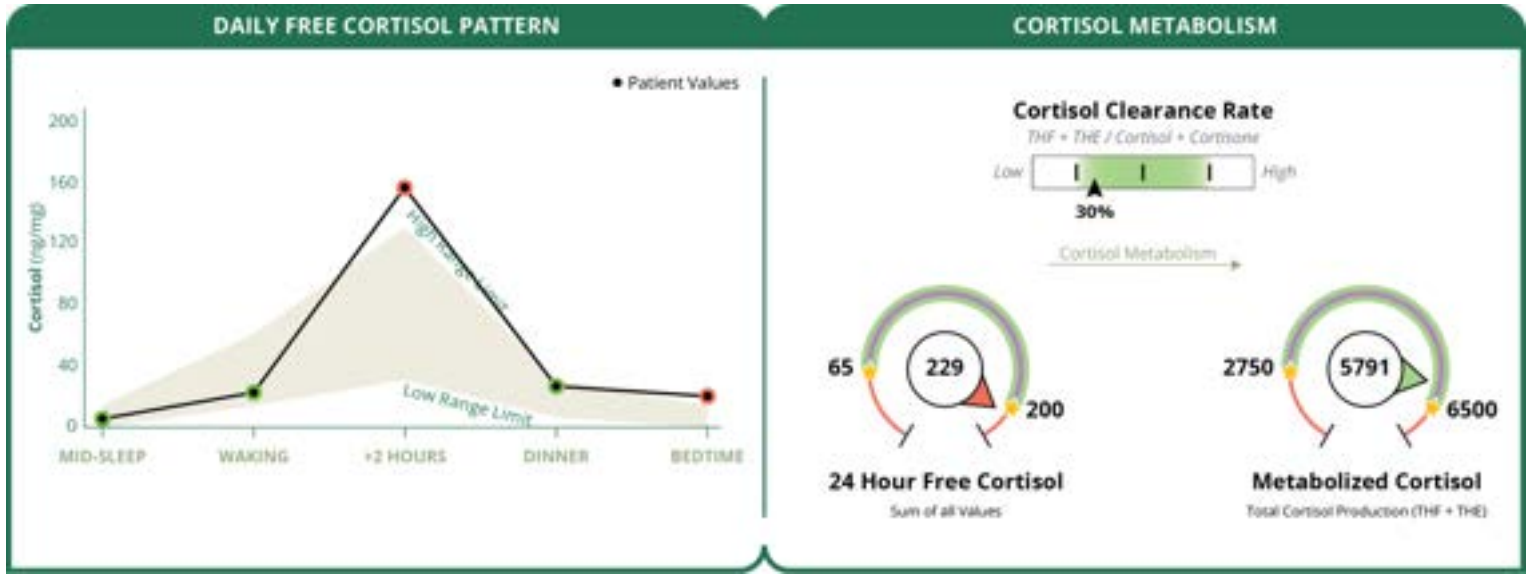
- **29-year-old female** diagnosed with PCOS. Complains of irregular cycles, high stress, facial hair, and breast tenderness. BMI 29.3.



- This patient's Total DHEA Production was 4,442 ng/mg (reference range 1,260-3,000 ng/mg). Is that what you would have expected given her cortisol results?

The DUTCH Dozen: Putting it all together!

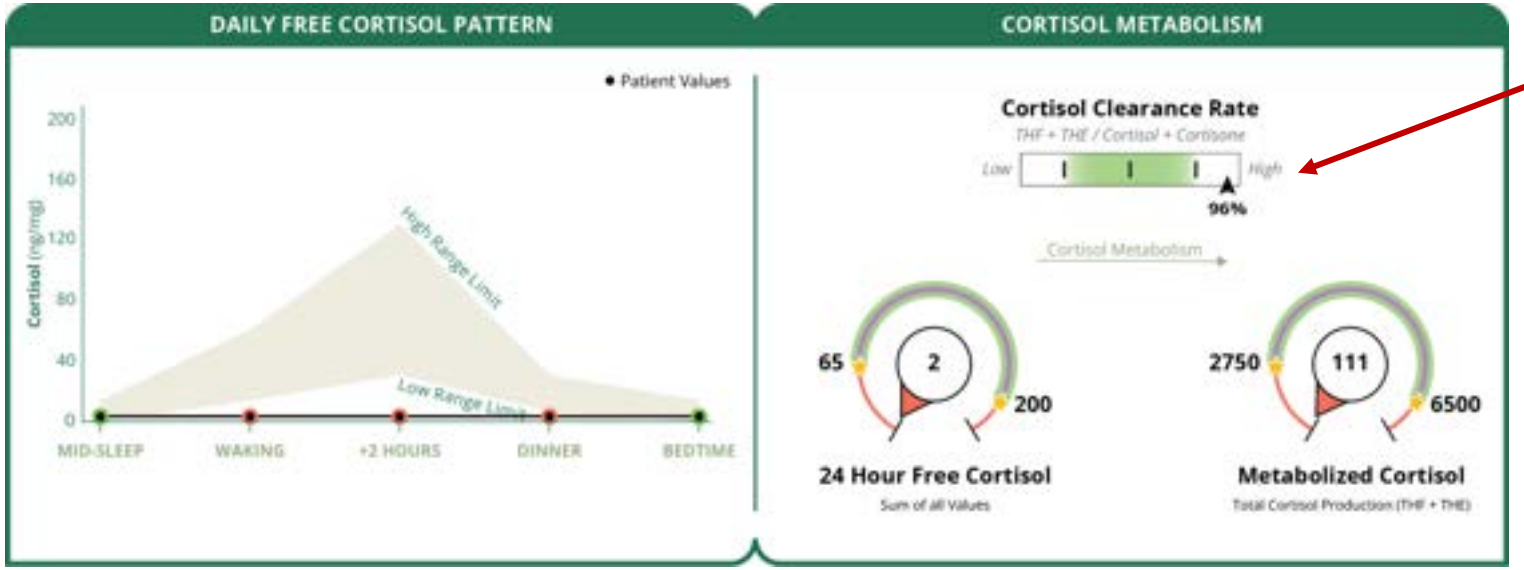
- 39-year-old female with suspected endometriosis. Complains of dysmenorrhea, heavy bleeding, and frequent night wakings. BMI 26.6.



- Did this patient have high cortisol while sleeping?
- Regarding her daily schedule, which time(s) of day (morning, noon, afternoon, evening) are you most interested to hear about in terms of how she feels and what she does?

The DUTCH Dozen: Putting it all together!

- **55-year-old PMP female** on 15 mg prednisone for the past month. She has not been able to taper below 15 mg without her ulcerative colitis flaring up. Complains of hair loss, hot flashes, irritability, and sleep issues. BMI 28.1.

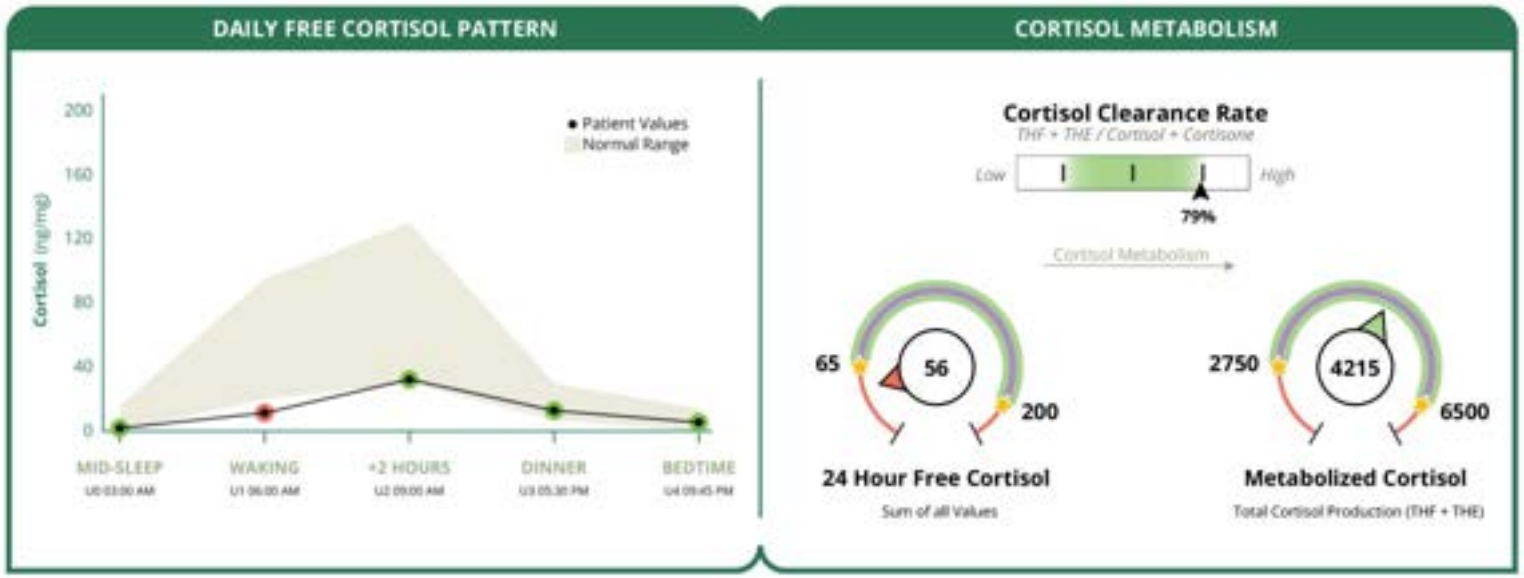


High CCR in the context of very low cortisol is not clinically significant.

- What clinical information can you get from the DUTCH cortisol data when someone is taking prednisone?
- What if this person was NOT on prednisone but had suspected Addison's disease – would it change your treatment plan?

The DUTCH Dozen: Putting it all together!

- **58-year-old PMP female** on 100 mg OMP, 0.075 E2 patch, 5 mg transdermal T cream, and 1.0 mg vaginal E3. Complains of acne, occasional bothersome hot flashes, and weight loss resistance. BMI 30.1.



- Does low or high (or both) cortisol contribute to weight loss resistance?
- **Her thyroid is normal. What is most likely contributing to her high CCR (79%)?**

References

References

- Newman M, Curran DA. Reliability of a dried urine test for comprehensive assessment of urine hormones and metabolites. BMC Chem. 2021 Mar 15;15(1):18.

Low CCR hypothyroidism, cholestasis, anorexia:

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- Iranmanesh A, et al. Dynamics of 24-hour endogenous cortisol secretion and clearance in primary hypothyroidism assessed before and after partial thyroid hormone replacement. J Clin Endocrinol Metab. 1990; 70: 155-161.
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References

High CCR Obesity, hyperthyroidism, fatty liver, insulin resistance, inflammation

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- Woods CP, et al. Tissue specific regulation of glucocorticoids in severe obesity and the response to significant weight loss following bariatric surgery (BARICORT). J Clin Endocrinol Metab. 2015; 100: 1434-1444.

Thank You!

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