Clinical Pearls for Assessing Stress

Anup Kanodia, MD, MPH, IFMCP
www.KanodiaMD.com

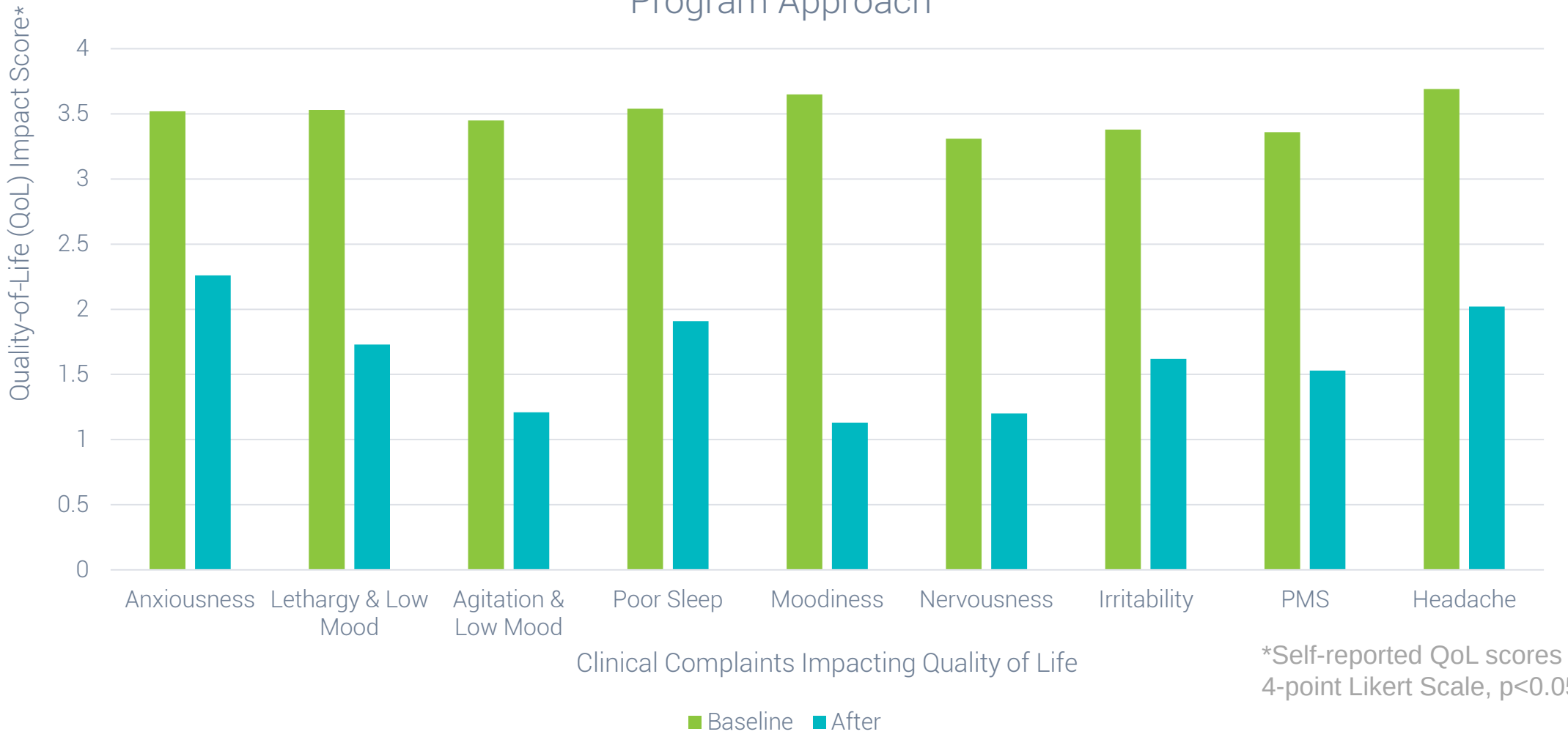
Your Speaker

Anup Kanodia, MD, MPH, IFMCP

- Trained under Mark Hyman for 2 years while at Harvard
- Practicing functional medicine for 15 years
- At KanodiaMD we see about 13,000 visits per year
- 95% of our patients see improvement in 3 months
- Google Rating of 4.9 stars
- We have run 752 of the HPA profiles with supplement recommendations

NeuroLab
A Division of Sanesco International

Patients Report Statistically Significant Improvements after NeuroWellness Program Approach



*Self-reported QoL scores on a 4-point Likert Scale, p<0.05

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NeuroLab

Proven Testing Methodologies

- Utilizes the gold standard technology for neurotransmitter analysis: UHPLC Triple Quadrupole Mass Spectrometry
- Highest level of sensitivity and specificity for neurotransmitters for the most accurate and reproducible results
- Every run is accompanied by a control
- Participates in voluntary, third-party, quality assurance testing

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A Division of Sanesco International

Webinar

Agenda

1. Recognize stress masquerading as other complaints
2. Utilize neurotransmitters as well as adrenal hormones to assess stress
3. Employ test results to create highly effective, personalized care plans
4. Implement a proven, step-by-step process to restore neuroadrenal balance and relieve stress
5. How to use neurotransmitter and adrenal test results to gain patient trust and compliance
6. Question & Answer session

NeuroWellness Program™

Evidence-Based

NeuroLab
A Division of Sanesco International

Survey Says…

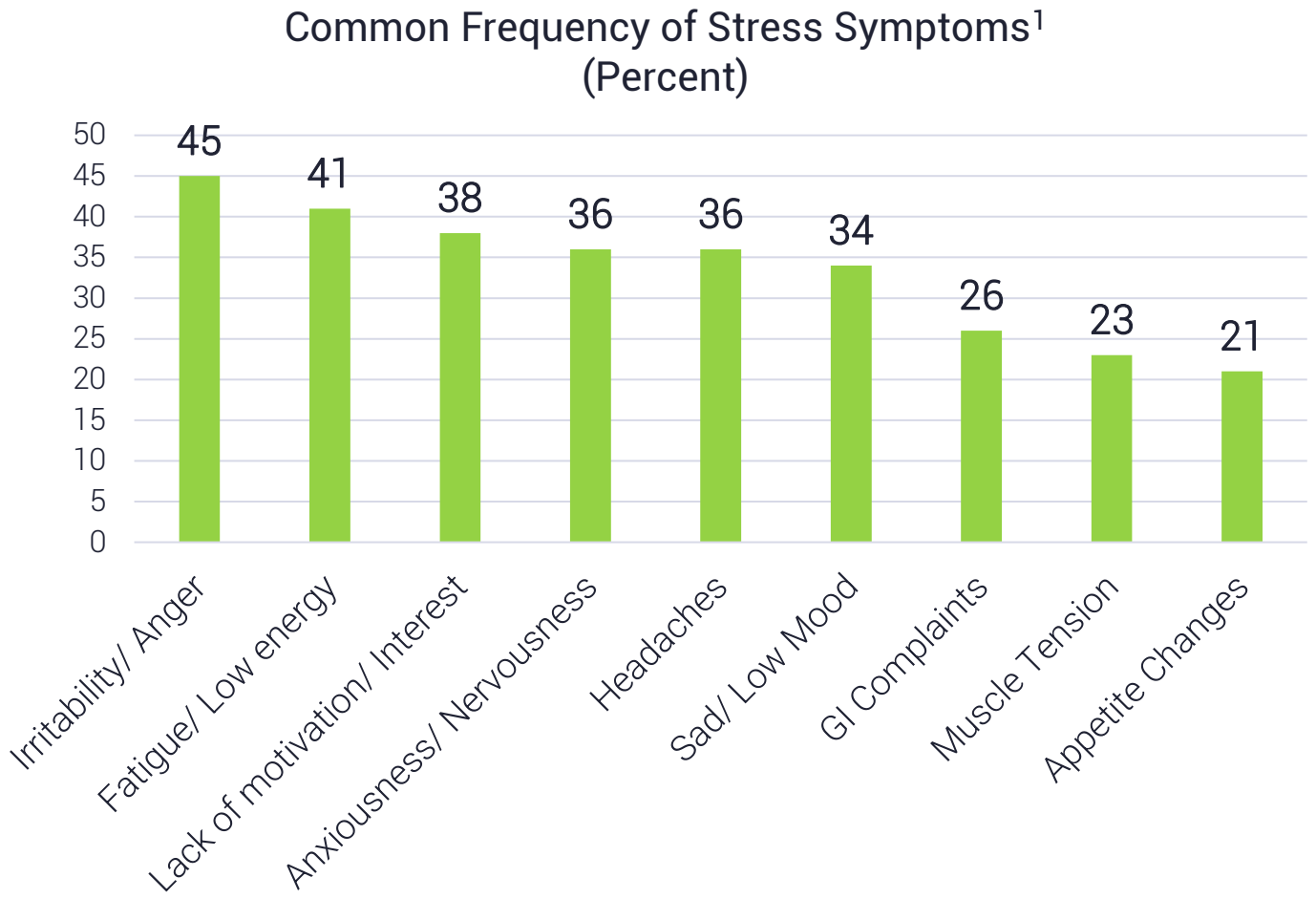
How Many People are Experiencing…

- Irritability/anger
- Fatigue
- Lack of motivation/interest
- Anxiousness/nervousness
- Headaches
- Sadness/low mood
- GI complaints
- Muscle tension
- Appetite changes

How Many People are Looking for New Ways to Help Yourself or Your Patients?

Survey Says…

The Common Link is Stress



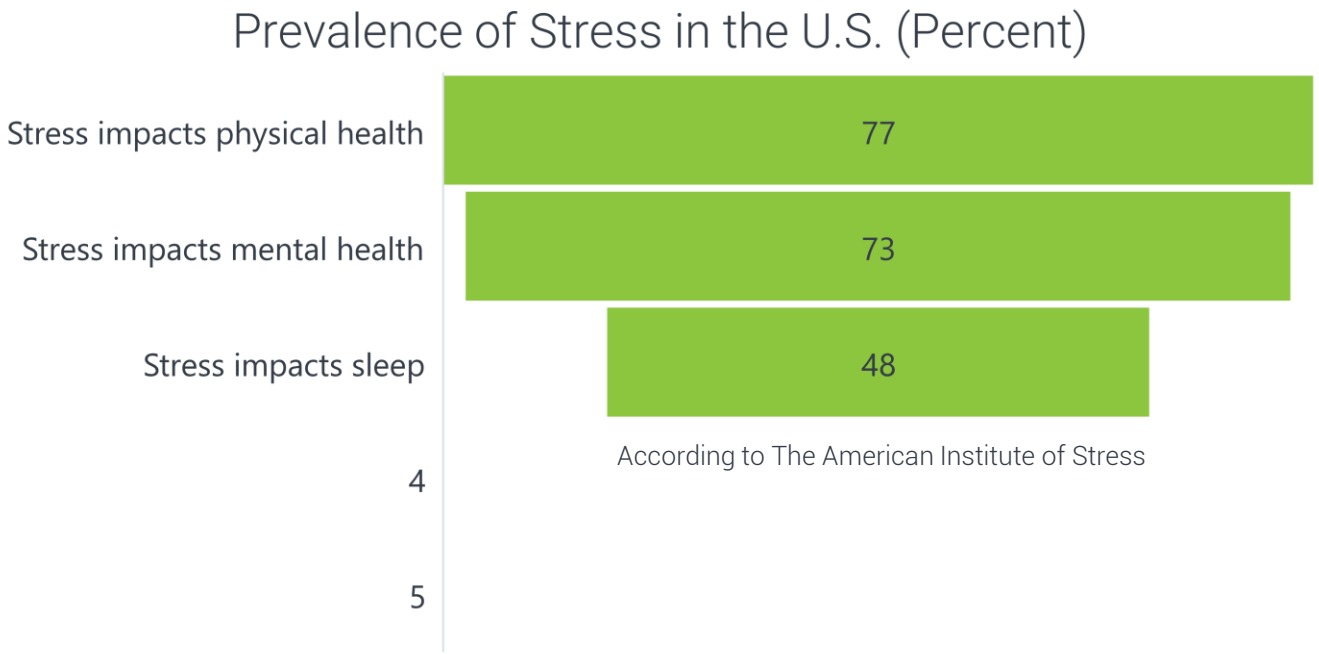
People may also experience:

- Sexual problems
- Weight changes
- Diarrhea or constipation
- Forgetfulness and lack of attention

https://www.therecoveryvillage.com/mental-health/stress/stress-statistics/

Quality-of-Life Concerns

Stress is on the Rise



The Global Organization for Stress reports that:

- **75%** of Americans experienced moderate to high stress levels in the past month
- **#1** health concern for high school students
- **80%** of people feel stress at work

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Quality-of-Life Concerns

What Percent of People See a Doctor for Symptoms Impacted by Stress?

A. 25%
B. 40%
C. 50%
D. 80%

75-90%

of all doctor's office visits are for stress-related ailments and complaints

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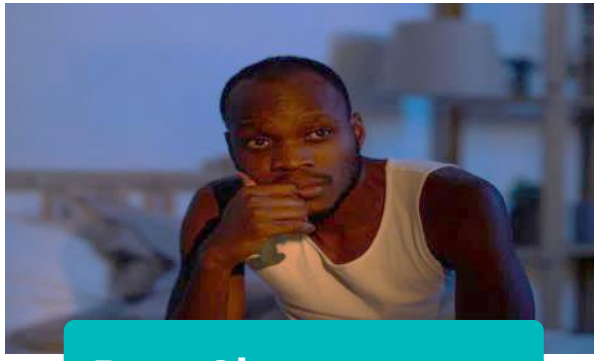
Why Test Neurotransmitters and Cortisol

What Activates the Stress Response?

Perceived Stress

- Mental/emotional stressors
- Biomarkers:
  - Serotonin
  - GABA
  - Norepinephrine
  - Glutamate



Poor Sleep

- Not getting enough sleep
- Biomarkers:
  - Melatonin
  - Cortisol
  - Serotonin
  - GABA
  - Norepinephrine
  - Glutamate

Inflammation

- Immune challenges
- Biomarkers:
  - TNF-α
  - IL-6
  - IL-1β
  - Cortisol
  - Norepinephrine
  - Epinephrine

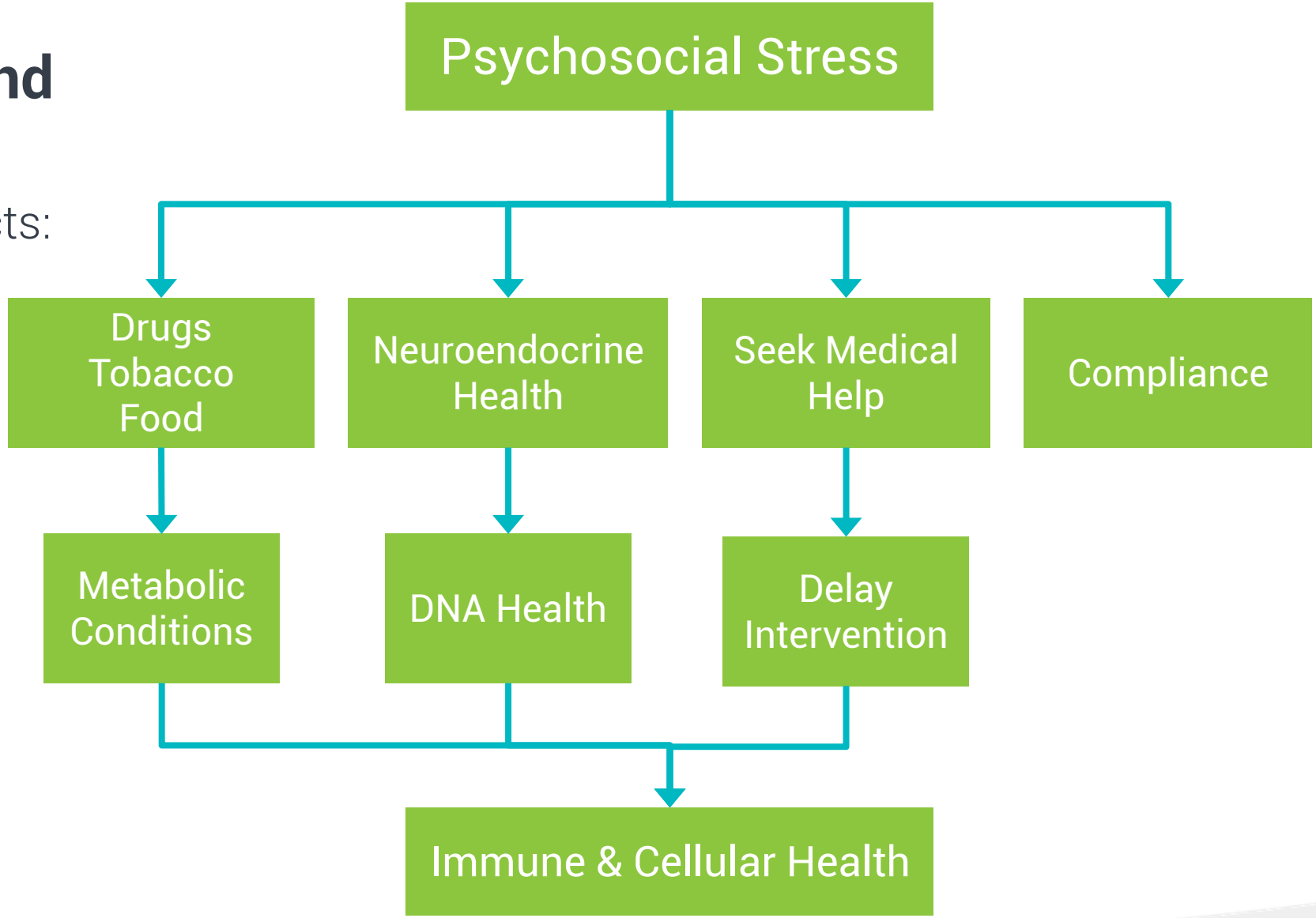
Glycemic Dysregulation

- Diet and nutrition
- Biomarkers:
  - Insulin
  - Cortisol
  - Norepinephrine
  - Epinephrine

Activating the Stress Response

Psychosocial Stress and Well-Being

- Psychological stress impacts:
  - Mood[4]
  - Glucose regulation[4]
  - Cardiovascular health[4]
  - Immune health[4,5]
  - Respiratory health[4]
  - Cellular health[5]



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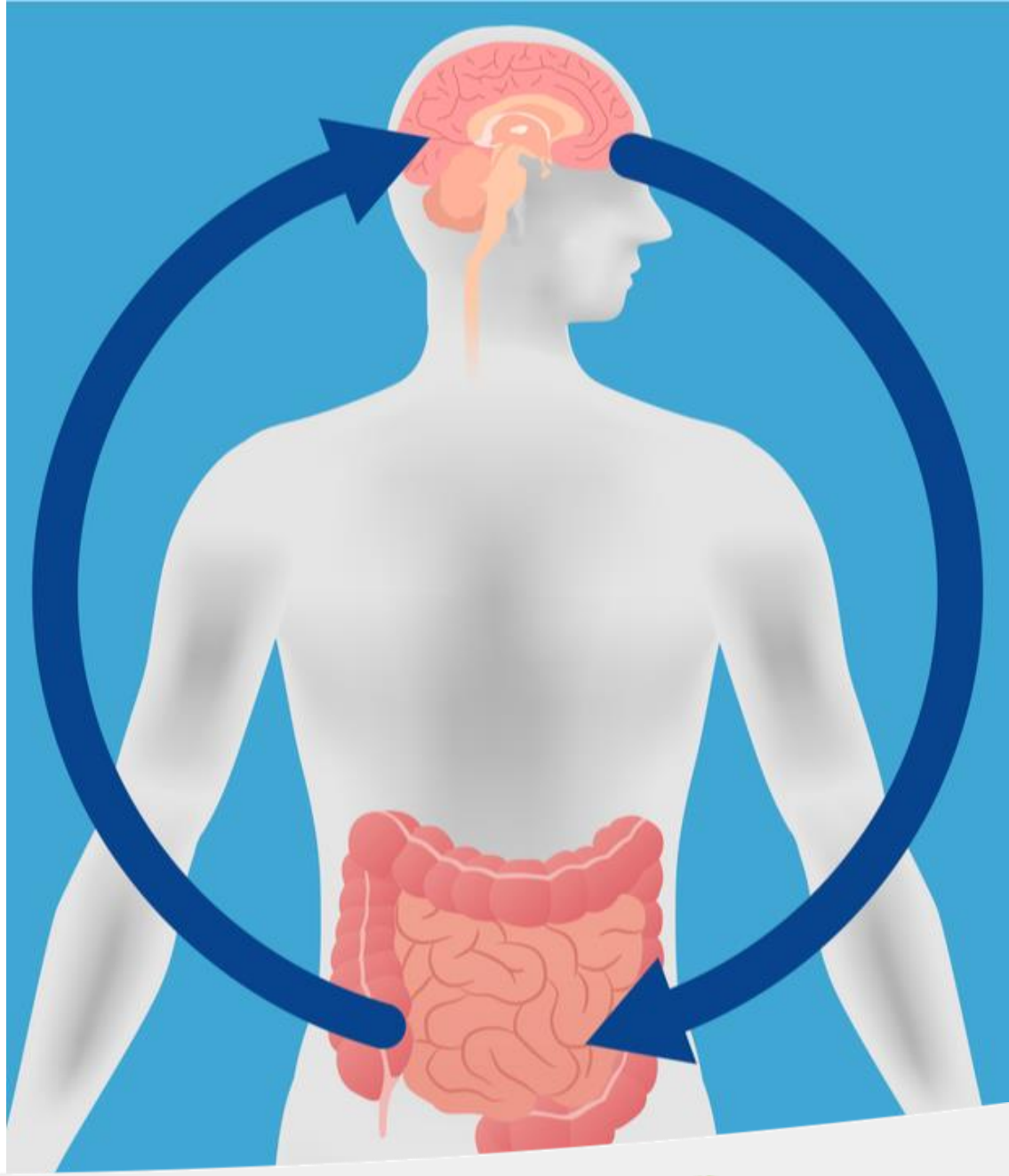
Activating the Stress Response

Stress & GI Health

- Stress impacts
  - Microbial balance and health
  - GI function
  - GI inflammation
  - Tissue health
- GI health impacts HPA drive



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Health in Balance

Making Changes when Stressed/Sad

- Physical activity and stress mutually influence each other
  - During stress, people engage in less exhausting activities and avoid exercise
    - Smoking, overeating, drinking
  - Stress predicts a decrease in physical activity
- Stress has a negative impact on eating behaviors
  - Alters eating behavior regarding overall calorie consumption
  - Change of the macronutrient composition during stressful times
    - Increase consumption of high-fat, high-sugar foods
    - Decrease in fruits and vegetables
  - More snacking

Health in Balance

3 Types of Stress

1. High cortisol
2. Low GABA, serotonin
3. Neuroadrenal burnout

Biomarker	Patient 1	Patient 2	Patient 3
Serotonin			▼
GABA		▼	▼
Dopamine			
Norepinephrine	▲	▲	▼
Epinephrine	▲		▼
Glutamate		▲	
PEA		▲	
Cortisol 1	▲		▼
Cortisol 2	▲		▼
Cortisol 3			▼
Cortisol 4	▲		
Intervention	Calm adrenals	Support GABA	Support inhibitory Support adrenal

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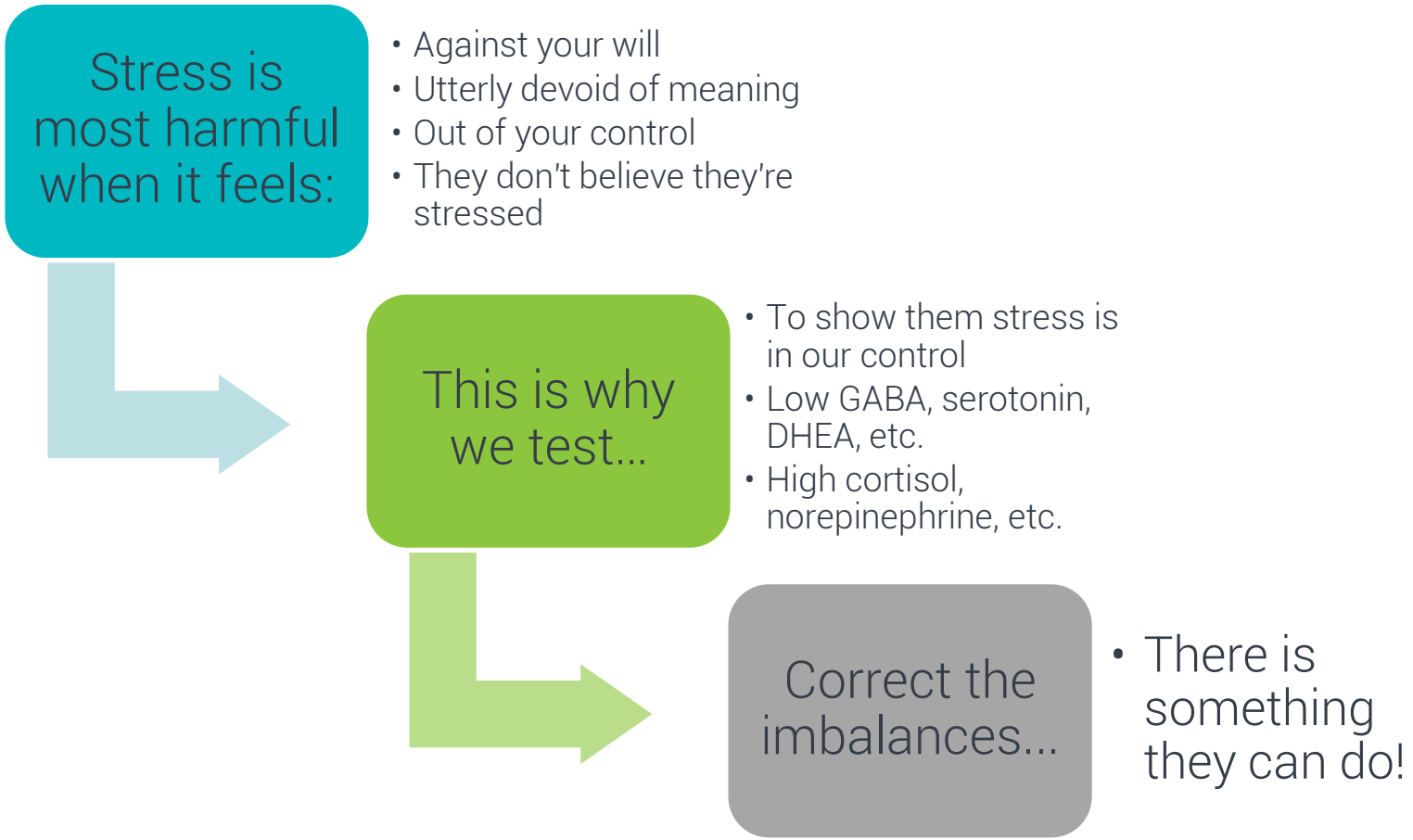
Empowering the Stressed Patient



https://news.stanford.edu/2015/05/07/stress-embrace-mcgonigal-050715/

Type 1 - Stress and Cortisol

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Get Started

HPA Profile

Adrenal Hormones

4-pt cortisol

2-pt DHEA-S

Neurotransmitters

Serotonin

GABA

Dopamine

Norepinephrine

Epinephrine

Glutamate

PEA

Promoting Calm and Resilience

Part 1

Hypothalamic-pituitary-adrenal (HPA) axis

- Adrenal hormones
  - Cortisol
  - DHEA
- Adrenal neurotransmitters
  - Norepinephrine
  - Epinephrine

Part 2

Inhibitory and excitatory neurotransmitter balance

- Inhibitory neurotransmitters
  - Serotonin
  - GABA
- Stimulating neurotransmitters
  - Norepinephrine
  - Glutamate

Get Started

HPA Profile

Marker	Values	Optimal Range	Reference Range
INHIBITORY NEUROTRANSMITTERS			
SEROTONIN	**120.9** (L)	125-260 mcg/g Cr	50-250 mcg/g Cr
GABA	**145.3** (L)	600-1100 mcg/g Cr	150-700 mcg/g Cr
EXCITATORY NEUROTRANSMITTERS			
DOPAMINE	**214.6** (L)	250-400 mcg/g Cr	100-350 mcg/g Cr
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ADRENAL ADAPTATION INDEX			
NOREPI/EPI RATIO	**6.3**	N/A	<13
ADRENAL HORMONES			
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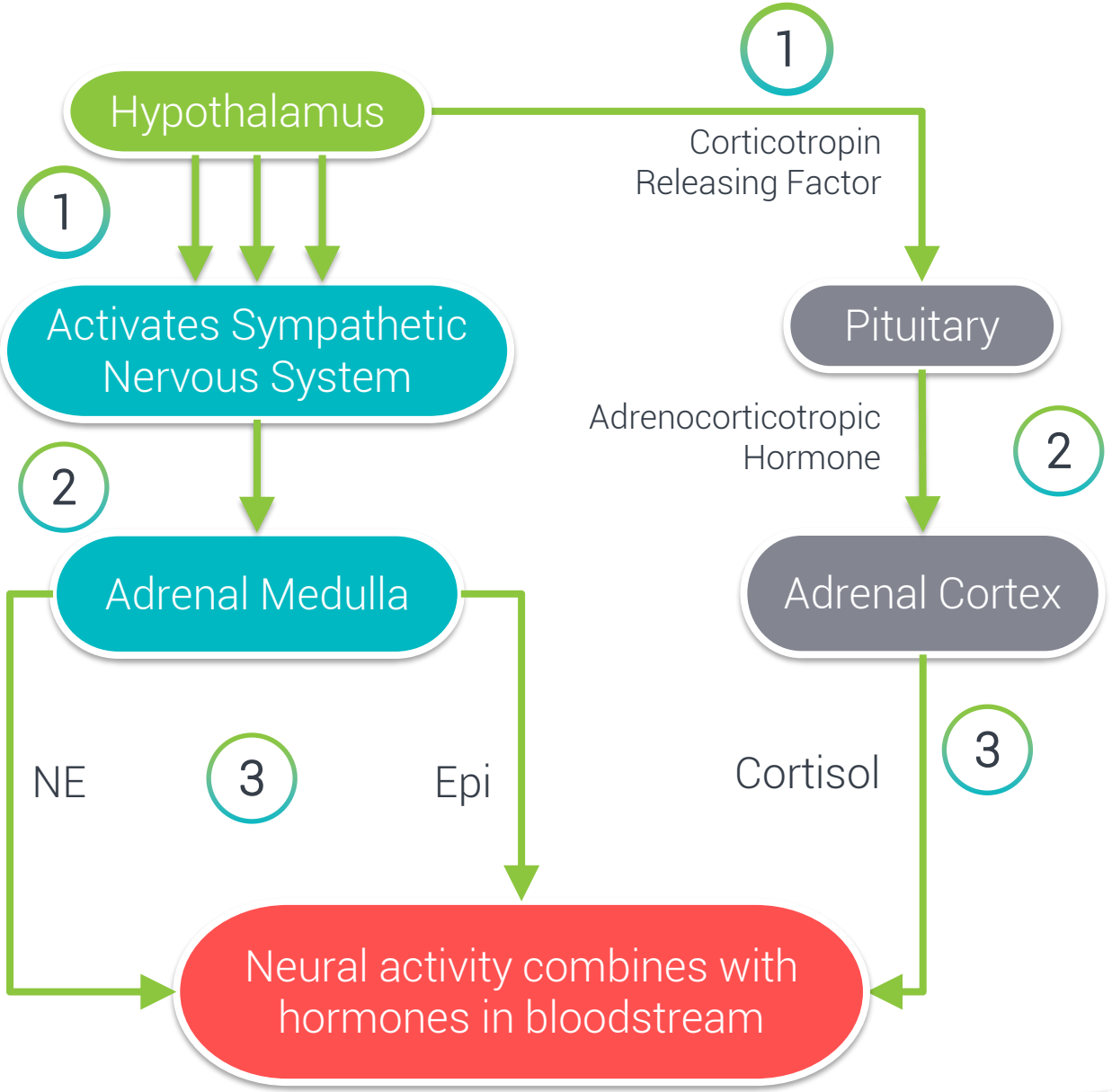
Why Test Neurotransmitters and Cortisol

The Stress Response

1. Stress stimulates the hypothalamus to release CRF and activate the sympathetic nervous system
2. CRH stimulates release of ACTH from the pituitary and SNS stimulates the adrenal medulla
3. ACTH activates the adrenals to release cortisol and DHEA from the cortex and the adrenal medulla releases Epinephrine and norepinephrine



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Health in Balance

Symptoms of High Cortisol

- Weight gain, around the midsection and upper back
- Weight gain and rounding of the face
- Acne
- Thinning skin
- Easy bruising
- Flushed face
- Slowed healing
- Muscle weakness, difficulty recovering from exercise
- Severe fatigue
- Irritability
- Difficulty concentrating
- High blood pressure
- Headache
- Intestinal complaints
- Low mood
- Anxiousness
- Low libido, erectile dysfunction, irregular menses
- Poor sleep
- Head, neck, jaw, or back discomfort

https://www.healthline.com/health/high-cortisol-symptoms#symptoms
https://www.premierhealth.com/your-health/articles/women-wisdom-wellness-/beware-high-levels-of-cortisol-the-stress-hormone

Health in Balance

Consequences of Elevated Cortisol

- Recurrent stress causes changes in the structure of neurons
- Long-term stress can lead to the death of neurons located in the hippocampus
  - PET and fMRI studies indicate a reduction in the volume of the hippocampus, prefrontal cortex and amygdala in low mood or trauma
- Serotonin (5-HT) deficiency due to the decreased availability of tryptophan
- Reduced density and reactivity of serotonin receptors

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8584322/

Health in Balance

Burning the Candle at Both Ends

- Cortisol is lipophilic, allowing it to penetrate the central nervous system
  - Glucocorticosteroid receptors (GR), located in the hippocampus and prefrontal cortex
  - Mineralocorticosteroid receptors (MR) located evenly throughout the central nervous system

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8584322/

Health in Balance

People Don't Know They are Running on Adrenaline

- Cushing's Syndrome
  - 40 to 70 out of every million people have "endogenous" Cushing's syndrome, meaning not due to a medication
    - Often goes undiagnosed or misdiagnosed
    - Cushing's effects are often associated with obesity instead—weight gain, high blood pressure, and diabetes
- Addison's Disease
  - 1 in 100,000 people in the U.S. have this primary adrenal insufficiency, in which the body does not make enough cortisol

Types 2 & 3 - Stress and Neurotransmitter Imbalances

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A Look at the Science

Beyond Cortisol

Epinephrine enhances the body's initial immune response[1]

Norepinephrine may help slow replication of some microbes[2]

Serotonin is needed for proper cortisol activity[3]

GABA helps decrease a stress response[4]

1. Zhou J, et al. *BioMed research international.* 2014.
2. Moriuchi M, et al. *Virology.* 2006;345(1):167-173.
3. Heisler LK, et al. *Journal of Neuroscience.* 2007;27(26):6956-6964.
4. Mody I, & Maguire J. *Frontiers in Cellular Neuroscience.* 2012;6: 4.

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Get Started

HPA Profile

Neurotransmitters

Serotonin

GABA

Dopamine

Norepinephrine

Epinephrine

Glutamate

PEA

Adrenal Hormones

4-pt cortisol

2-pt DHEA-S

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Calming

Serotonin's Role

- Decreases in serotonin are known to play a role in mood, anxiousness, and anger

- Often inhibits excitatory neurotransmitters such as dopamine and norepinephrine

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Calming

GABA's Role

- Biochemically
  - GABA is the primary inhibitory neurotransmitter in the nervous system
  - Often controls glutamate and norepinephrine activity
  - May help with lowering cortisol
- Clinically
  - Low levels of GABA associated with anxiousness and hyperactivity
  - $GABA_A$ receptor agonists are commonly used to promote calm and sleep[1]

1. Griffin, C. E., 3rd, Kaye, A. M., Bueno, F. R., & Kaye, A. D. The Ochsner journal. 2013;*13*(2), 214–223.

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Stimulating

Glutamate's Impact

- Biochemically
  - Glutamate is highly stimulating and can be excitotoxic
- Clinically
  - High levels play a role in anxiousness[1]
  - Worry is commonly connected with stress and sleep issues

1. Tzschentke, T. Amino Acids (2002) 23: 147.

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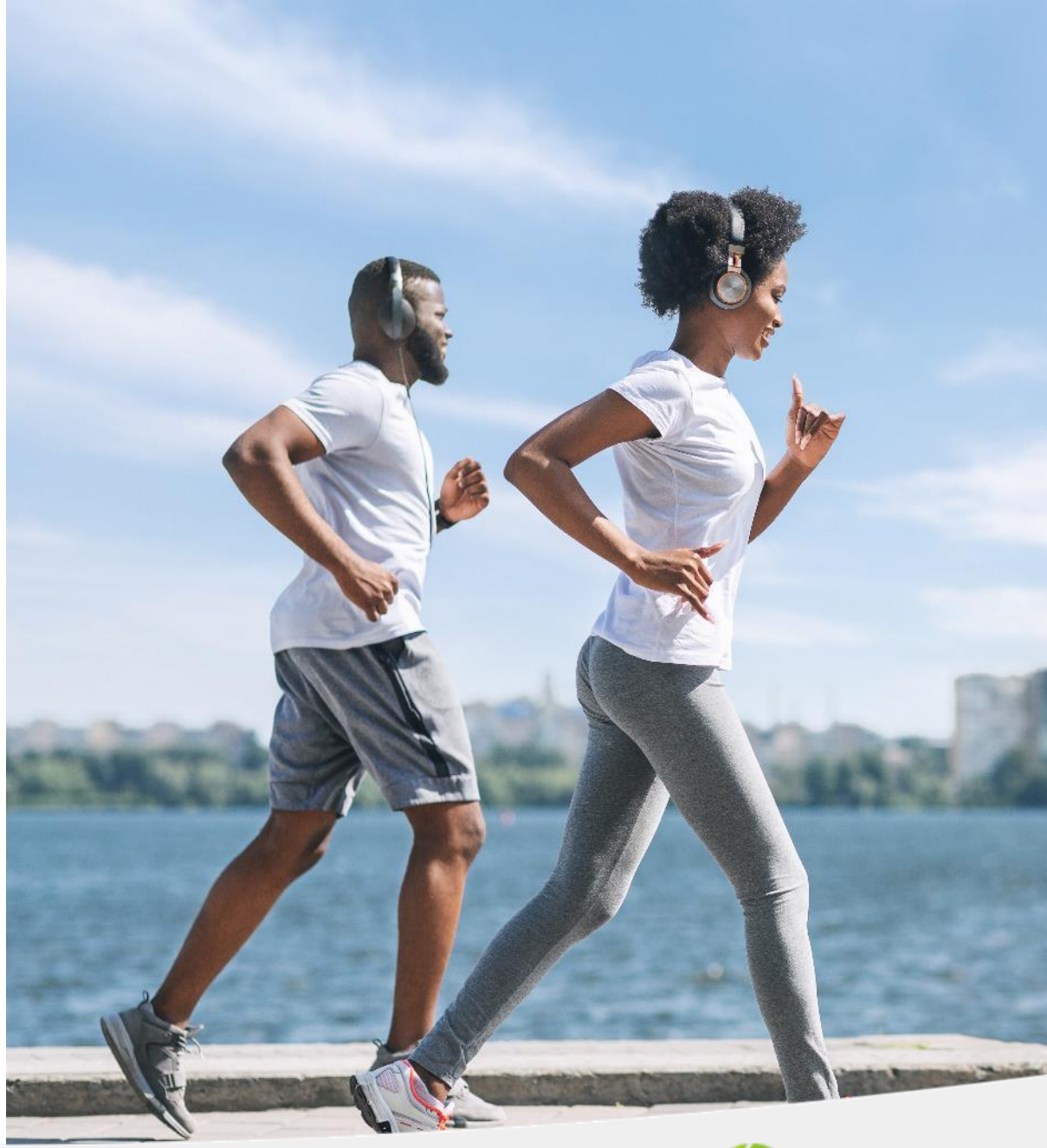
Stimulating

Norepinephrine's Impact

- Biochemically
  - Secreted by the locus coeruleus nuclei in the brain
  - Also, an adrenal hormone
- Clinically
  - High levels are associated with stress, anxiousness and anger



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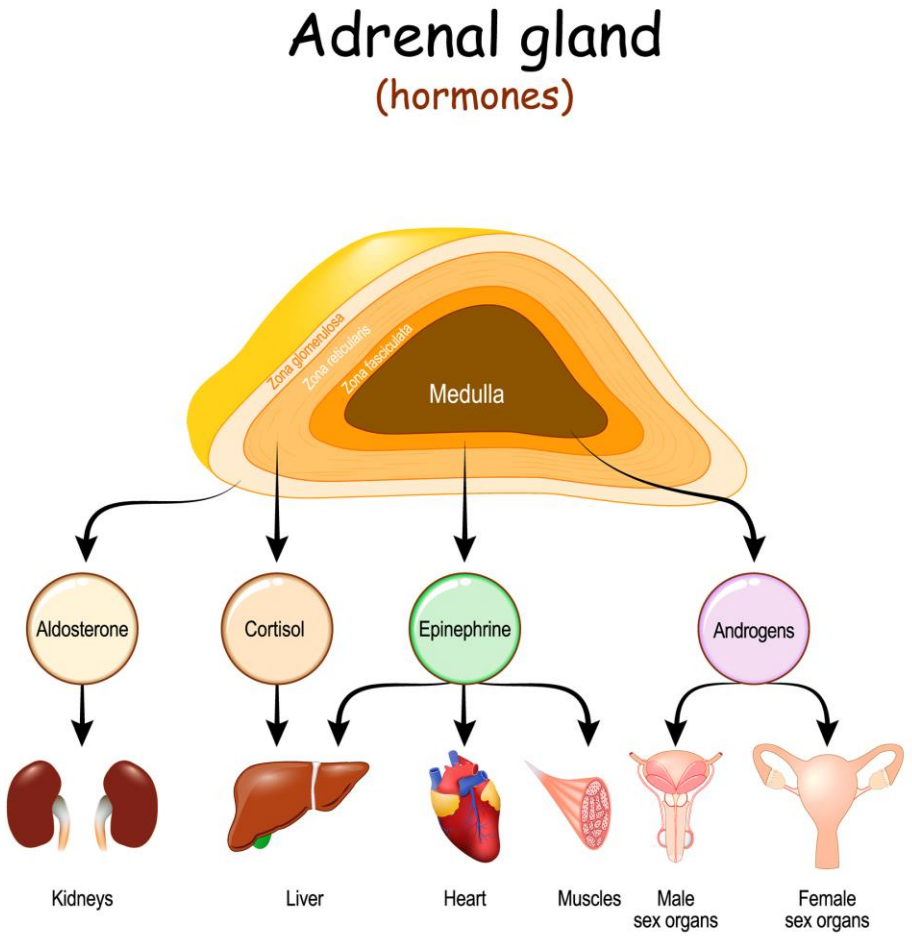
Stimulating

Epinephrine's Impact

- Biochemically
  - Produced by the adrenal medulla
- Clinically
  - High levels: stress, anxiousness and blood sugar dysregulation



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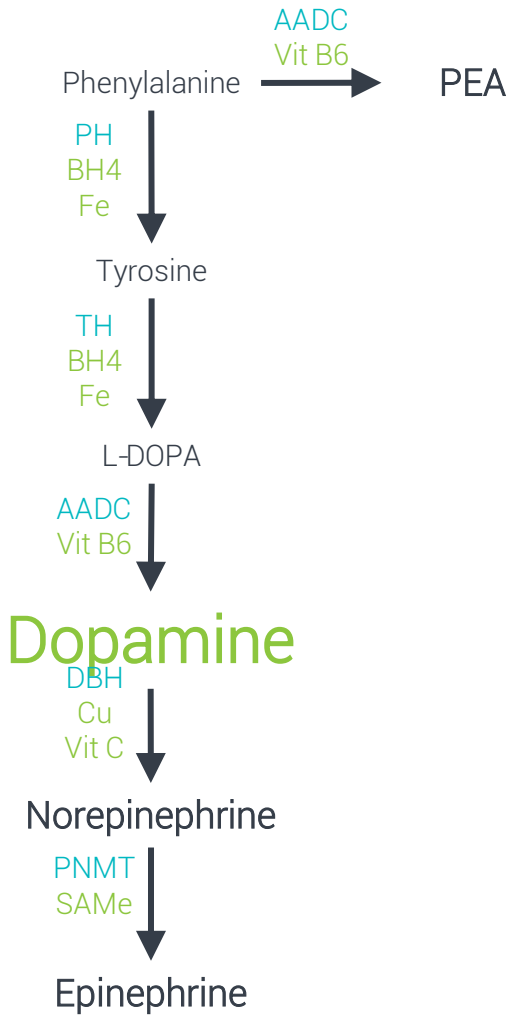
Stimulating

Dopamine

- Biochemically
  - Critical pathways:
    - Mesolimbic, pleasure-reward pathway
    - Mesocortical, cognitive pathway
    - Tuberoinfundibular pathway regulating prolactin release
- Clinically
  - High levels: developmental problems, poor impulse control, delusions, out of touch with reality
  - Low levels: Lack of motivation/focus, cravings, low libido, lack of joy



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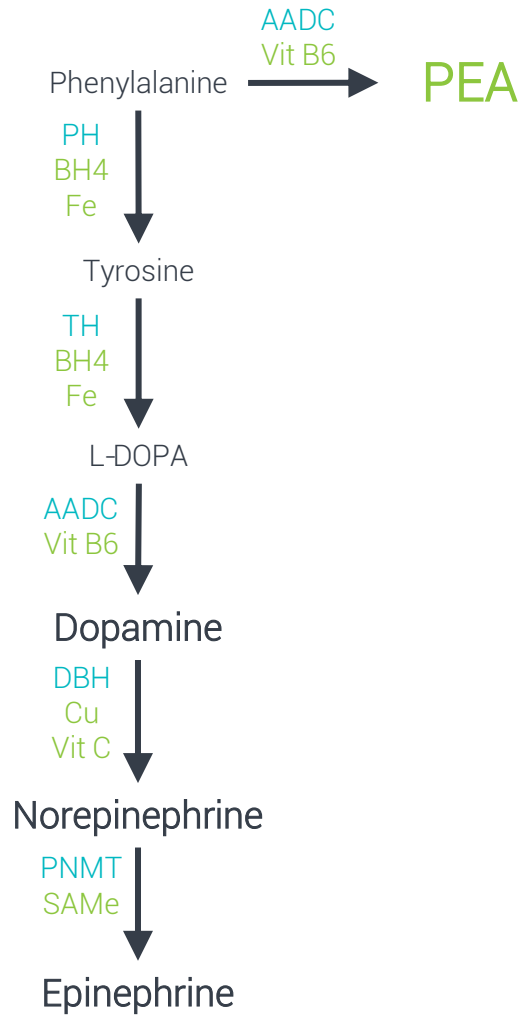
Stimulating

PEA

- Biochemically
  - Associated with increased HPA reactivity
- Clinically
  - High levels: anxiousness and overstimulation
  - Low levels: delusions, fear, lack of attention/focus, sadness



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Sanesco Study

Improving Anxiousness

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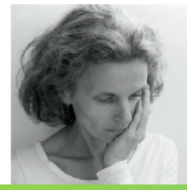
ANXIOUSNESS and the Role of Neuroendocrine Health

Proven Results Using Sanesco's Evidence-Based Clinical Model



Do your patients complain of anxiousness?

Are your patients searching for an alternative to the pharmaceutical model?

Are you looking for new ways to engage your patients?

patients who complain of problems with libido, stamina, focus, and sleep also show improvement after intervention with the CSM™ model (testing followed by recommended TNT™ protocols).

Patient Example 1: Anxiousness with Low Serotonin and High Norepinephrine

	Serotonin	Nor-epinephrine	ANXIOUSNESS	IRRITABILITY	MOODINESS	FATIGUE
Baseline	40.7	46.8	Severe	Severe	Severe	Severe
After CSM, TNT	130.5	29.9	Mild	Mild	None	Mild

Patient Example 2: Anxiousness with Low GABA and High Glutamate

	GABA	Glutamate	ANXIOUSNESS	JOINT PAIN	POOR LIBIDO	POOR MEMORY	POOR FOCUS	POOR SLEEP	SHAKINESS
Baseline	226.4	23.8	Severe	Severe	Profound	Moderate	Profound	Severe	Severe
After CSM, TNT	710.9	4.8	None	None	None	None	None	None	None

Patient Example 3: Anxiousness with Low GABA and Low Serotonin

	Serotonin	GABA	ANXIOUSNESS	LOW MOOD	FATIGUE	POOR STAMINA
Baseline	40.7	46.8	Severe	Severe	Severe	Severe
After CSM, TNT	130.5	29.9	Mild	Mild	Mild	None

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Improving Anxiousness

The NeuroWellness Program supports patients complaining of anxiousness and addresses comorbid complaints

Evidence-based Approach
for Anxiousness

Statistically Significant Neuroendocrine Improvements (p<0.05)

- Increased serotonin levels in anxious patients by 300%
- Increased norepi/epi ratio by 20% Low levels of this ratio are associated with risky behaviors
- Lowered glutamate by more than 40%

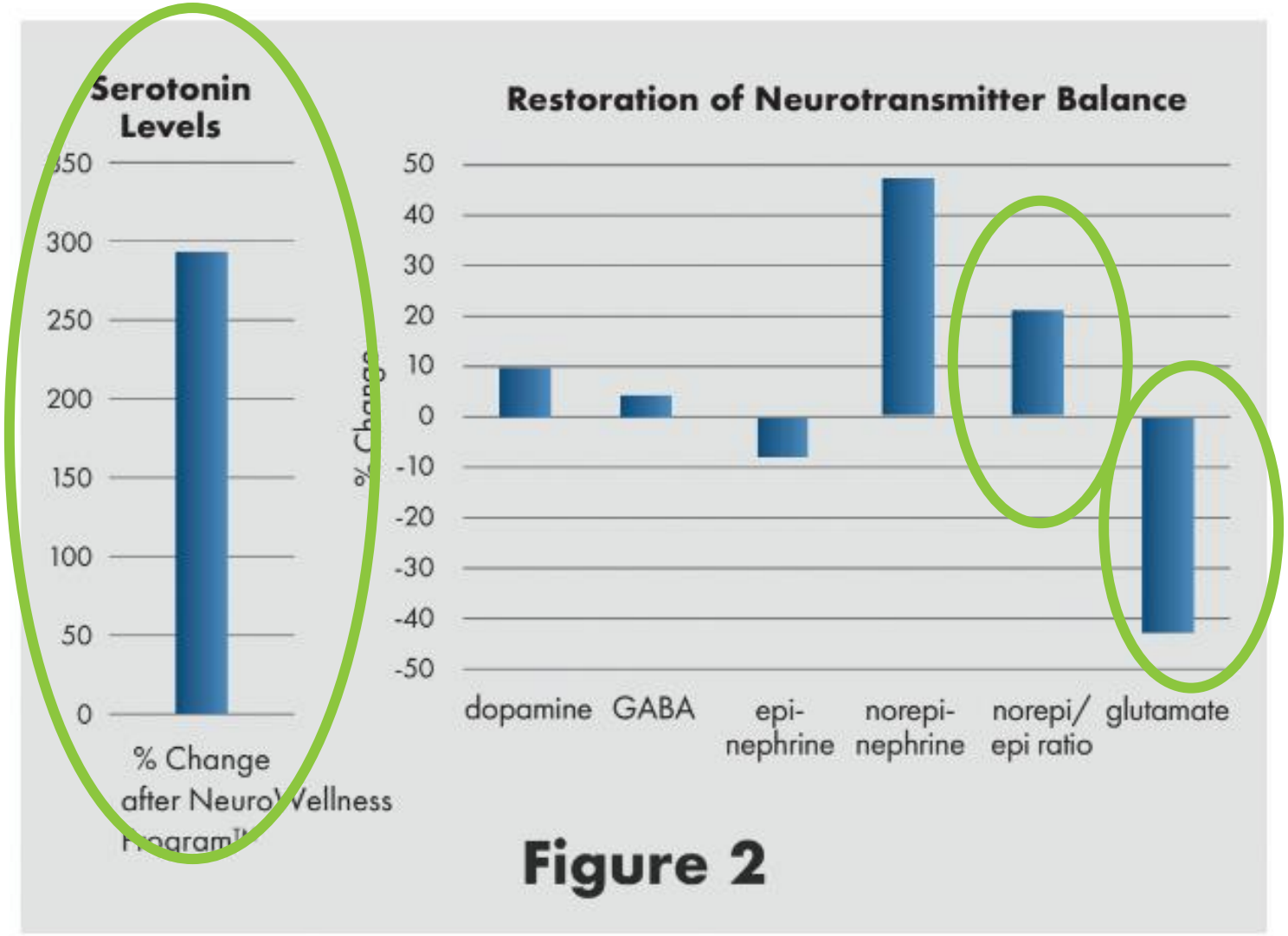

Figure 2

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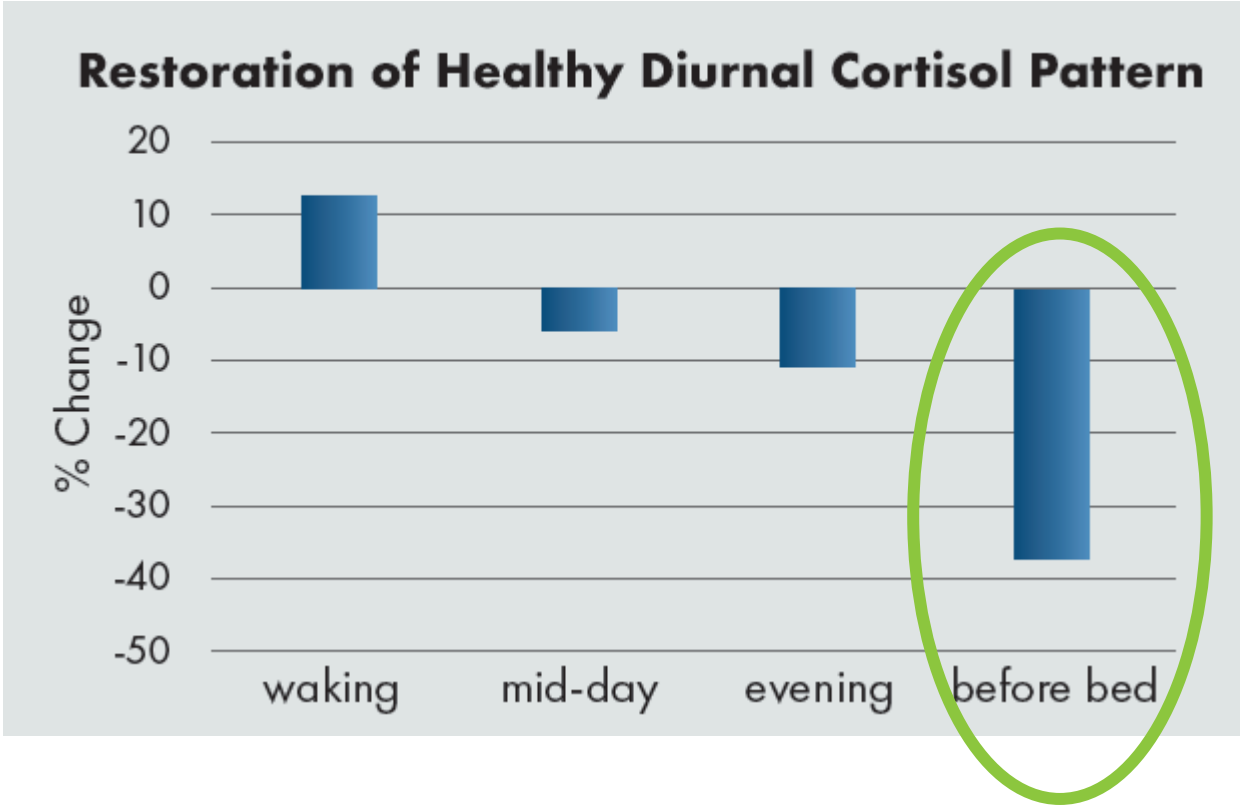
Evidence-based Approach
for Anxiousness

Restoration of Healthy Diurnal Cortisol Pattern

- Anxious patients often have difficulty sleeping
- Elevated evening cortisol can disrupt sleep
- The NeuroWellness Program significantly reduced before bed cortisol ($p<0.05$)



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Treating NeuroAdrenal Stress

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Case Study

F, Age 44 Baseline

- History
  - Abdominal bloating
  - Fatigue
  - Brain fog
  - Shoulder/hip pain
  - Severe gluten reactions
  - PMS
  - Depression
  - Candida overgrowth
  - Nutritional deficiencies

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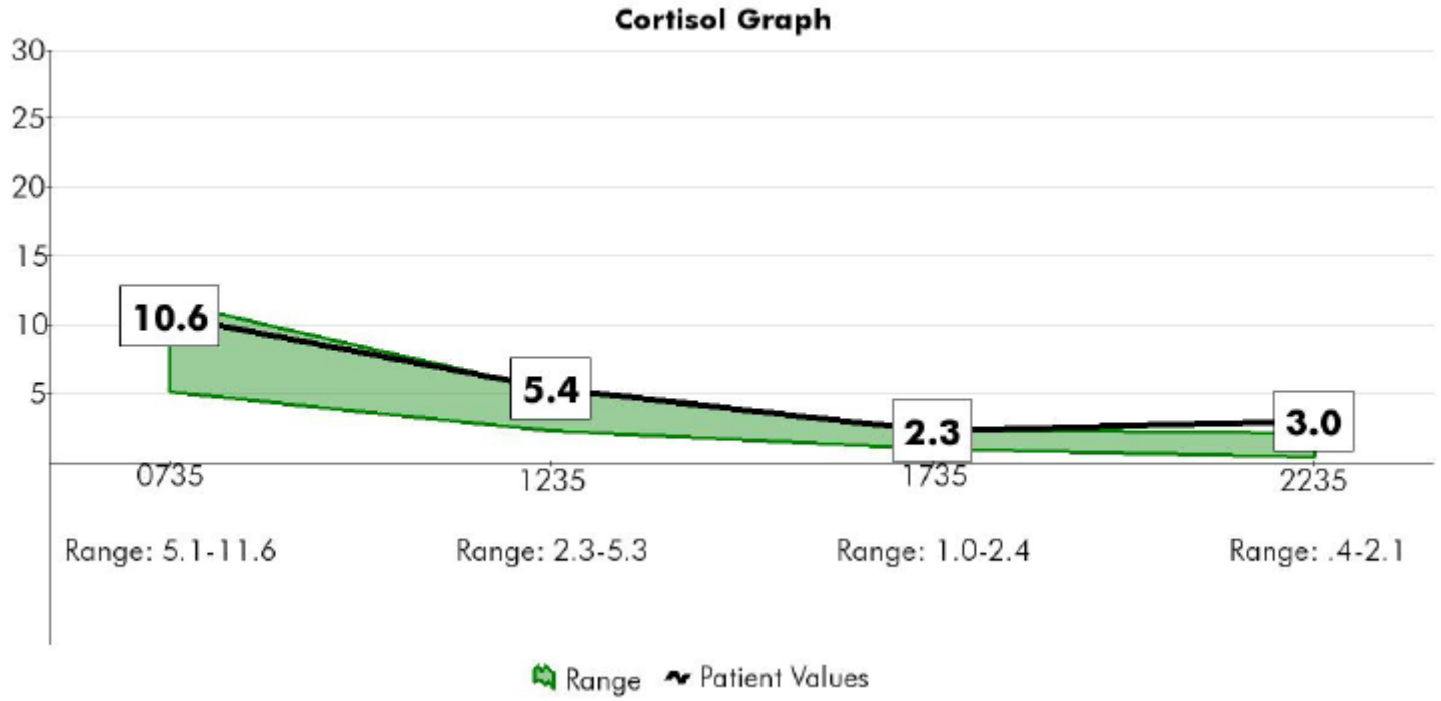
Case Study

F, Age 44 Baseline

- History
  - Stressful lifestyle



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Case Study

F, Age 44 Baseline

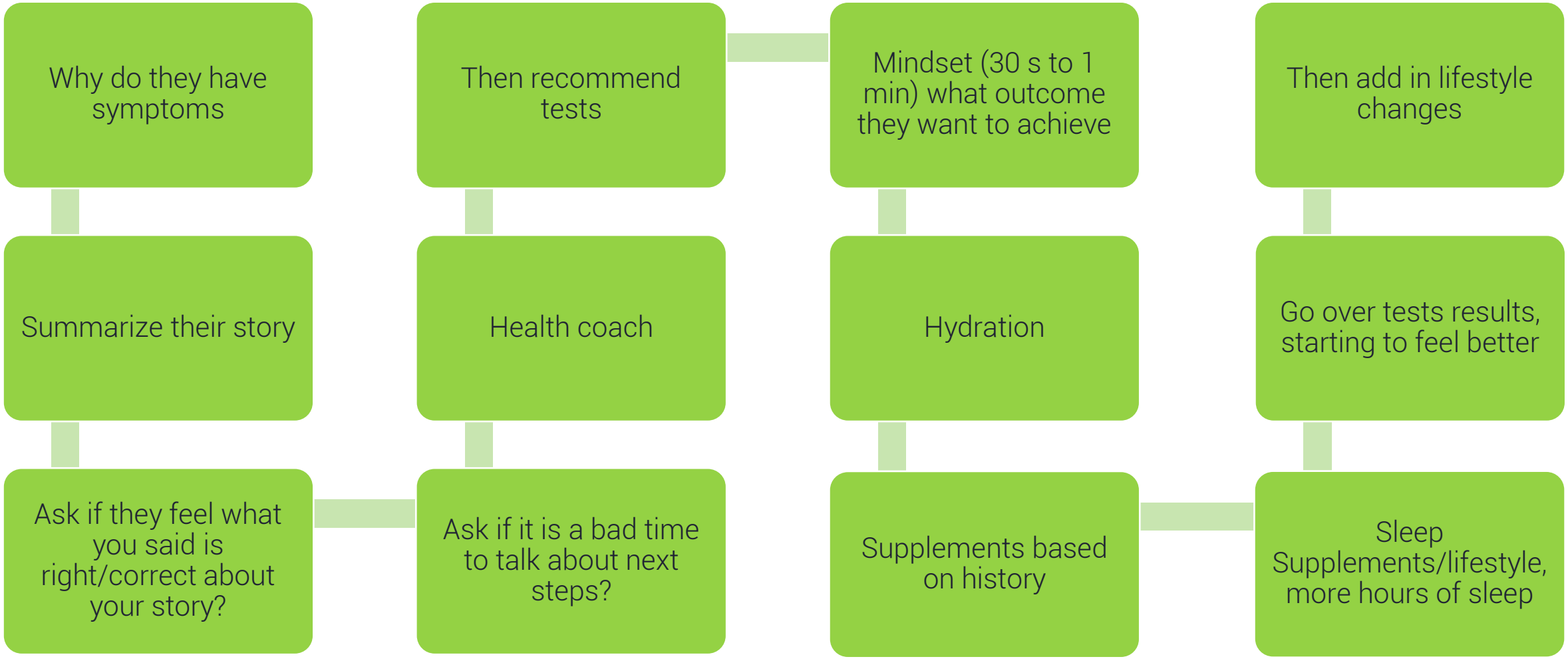
Prolent	*x 1 in the PM for inhibitory support* *Contains: 5-HTP, Suntheanine, Glycine, and Vitamin B6*
Lentra	*x 1 daily for GABA support; increase to twice daily after 5 days.* *May be increased during luteal phase.* *Contains: GABA-A agonists: Magnesium Taurate, Suntheanine, and Lactium*
Procite-D	*After 14-21 days and once anxiety improves, implement x 1 in the AM every other day for catecholamine support.* *Contains: Mucuna pruriens, N-acetyl-L-tyrosine, DL-phenylalanine, NAC and B vitamins*

Retesting is an important part of this process. NT levels need to be monitored. Retesting for this patient is recommended in 9 weeks.

Additional Recommendations

* It is recommended that all patients on a program to balance HPA axis function should also supplement with B complex, a multi-mineral and multi-vitamin as well as EPA/DHA.

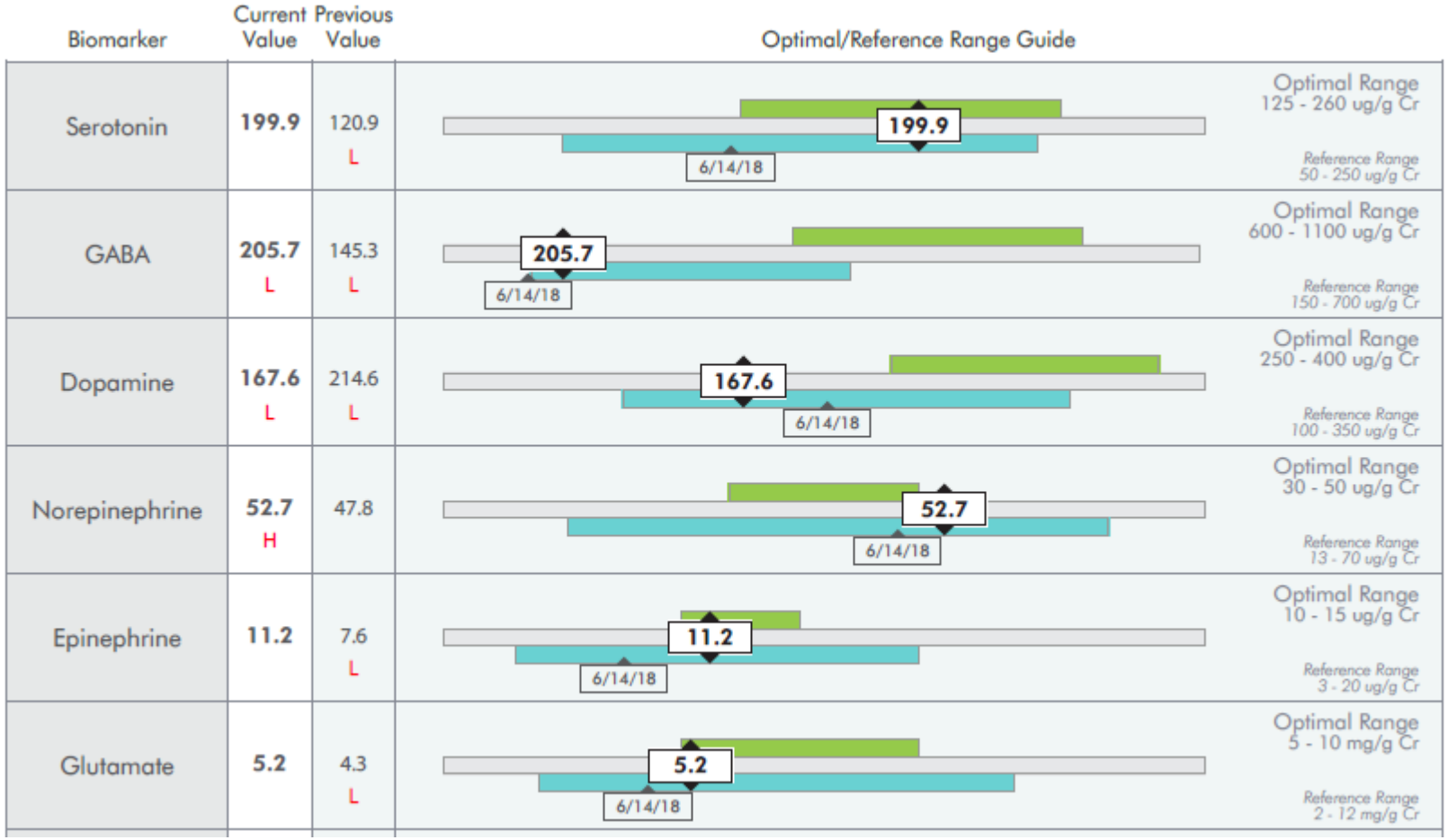
Steps for Restoring Resilience



Case Study

F, Age 44 Retest

- History
  - Stressful lifestyle
- Rx
  - Procite-D
  - Prolent
  - GABA
  - Glutamine
  - Magnesium
  - Probiotics
  - Pregnenolone
  - Iron chelate
  - D3
  - Vital nutrients PMS Support
  - RelaxMax
  - GI Complete

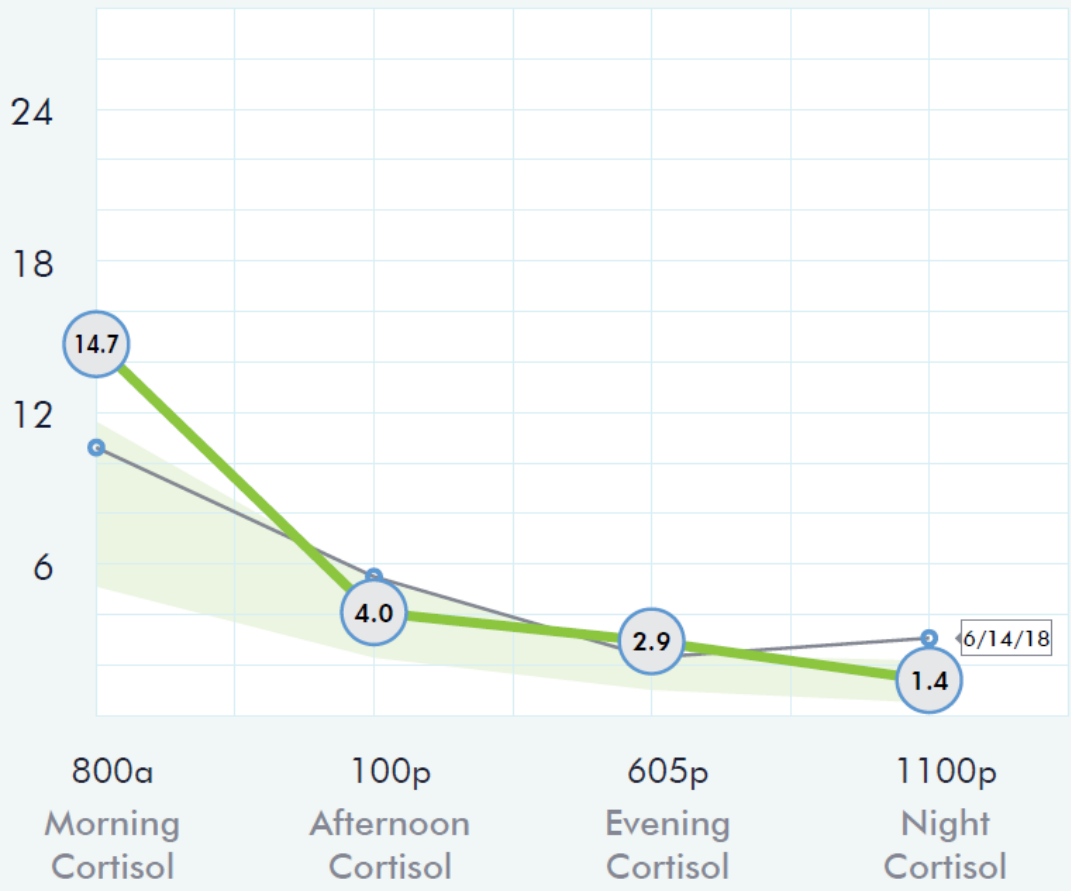


Sanesco® health in balance

Case Study

F, Age 45 Retest

Morning Cortisol Reference Range 5.1 - 11.6 nM	800a **14.7** H	10.6	14.7 6/14/18
Afternoon Cortisol Reference Range 2.3 - 5.3 nM	100p **4.0**	5.4 H	4.0 6/14/18
Evening Cortisol Reference Range 1 - 2.4 nM	605p **2.9** H	2.3	2.9 6/14/18
Night Cortisol Reference Range 0.4 - 2.1 nM	1100p **1.4**	3.0 H	1.4 6/14/18
Morning DHEA-s Reference Range 1 - 6.0 ng/mL	800a **3.4**	1.5	3.4 6/14/18
Afternoon DHEA-s Reference Range 1 - 6.0 ng/mL	605p **0.8** L	0.9 L	0.8 6/14/18



Sanesco® health in balance

Case Study

F, Age 45 Retest

Prolent™

For serotonin support: 5-HTP, Suntheanine®, Glycine, Vitamin B6, and Neuro Support Blend™

Based on the clinician's assessment and judgment, x 1 every other day in the PM for serotonin support. Use caution with SSRIs, anti-depressants, and other serotonergic medications, supplements, or substances. If taking Tranquilent™, consider a lower dose.

Lentra™

For GABA support: Magnesium Bisglycinate, Taurine, Suntheanine®, Lactium®, and Neuro Support Blend™

x 1 twice daily for GABA support, based on the clinician's assessment and judgment may increase to three times daily after 10 days if needed. Use caution with GABAergic or CNS depressant medications or substances, such as anxiolytics, anti-convulsants, opioids, muscle relaxants, and nerve pain medication. Additionally, use caution with medications or substances that lower blood pressure.

Tranquilent™

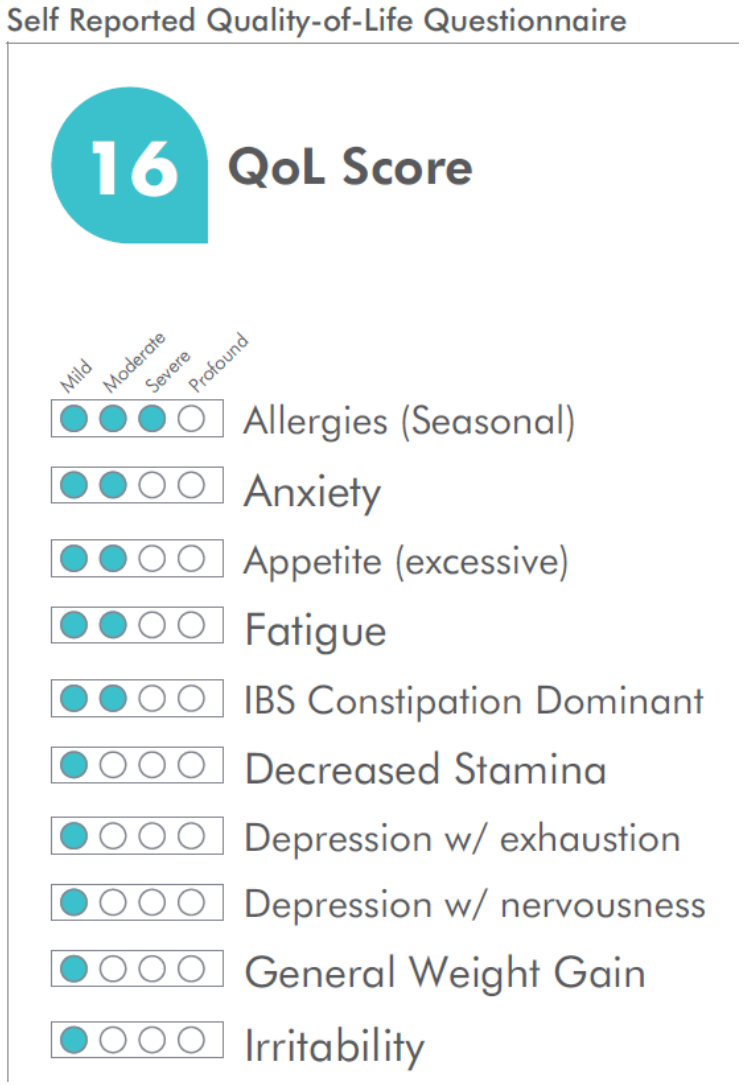
For mood support: Low doses of 5-HTP and Suntheanine®, with Myo-Inositol.

x 1 – 2 as needed for anxiousness or mood support. Do not exceed 4 tablets per day. Use caution with SSRIs, anti-depressants, and other serotonergic medications, supplements, or substances. If taking Prolent™, consider a lower dose. NOTE: Limited data suggests inositol may lower blood sugar. Use caution in hypoglycemia, diabetes, or insulin use.

Case Study

F, Age 21 Baseline

- History
  - Stomach bloating
  - Gas
  - Fatigue

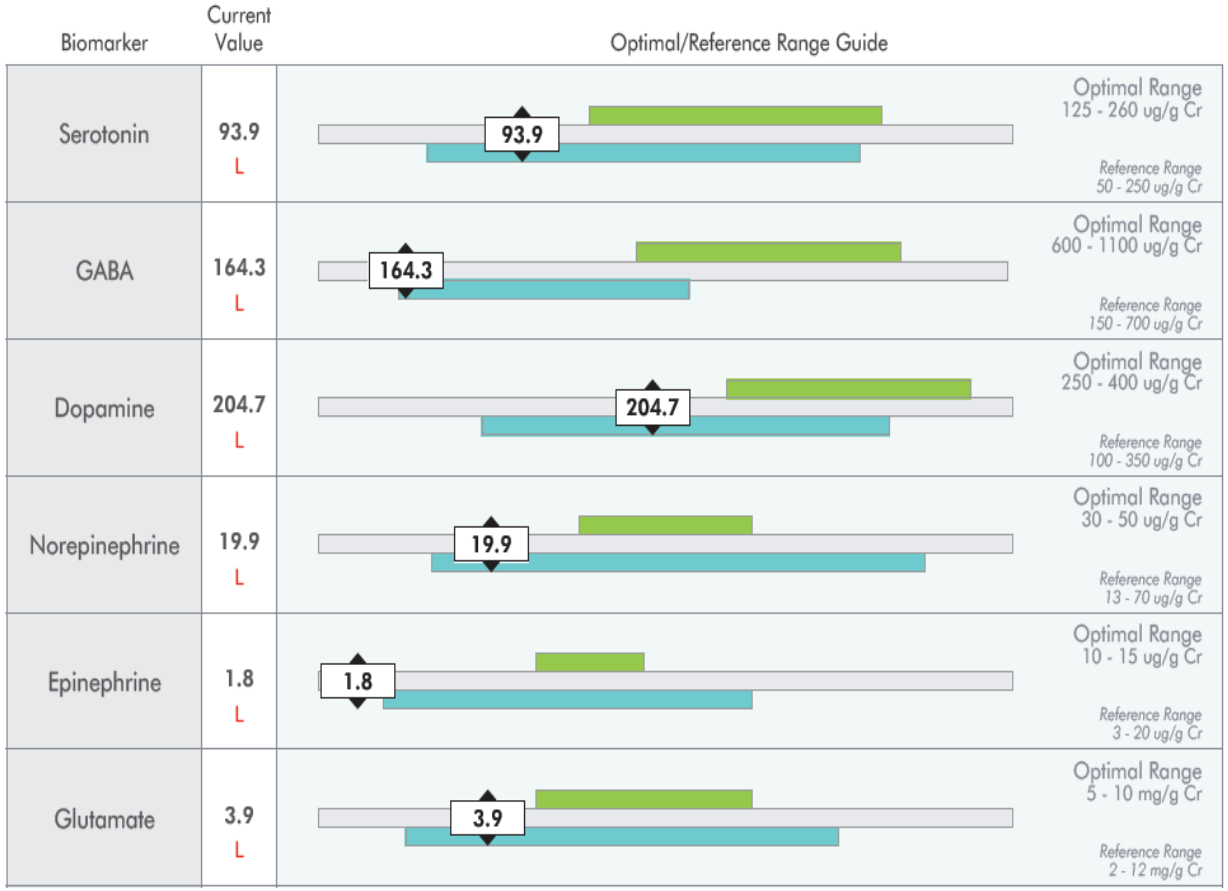


Sanesco® health in balance

Case Study

F, Age 21 Baseline

- Lifestyle
  - Regular exercise
- Meds/Supplements
  - Zyrtec
  - Multivitamin + iron

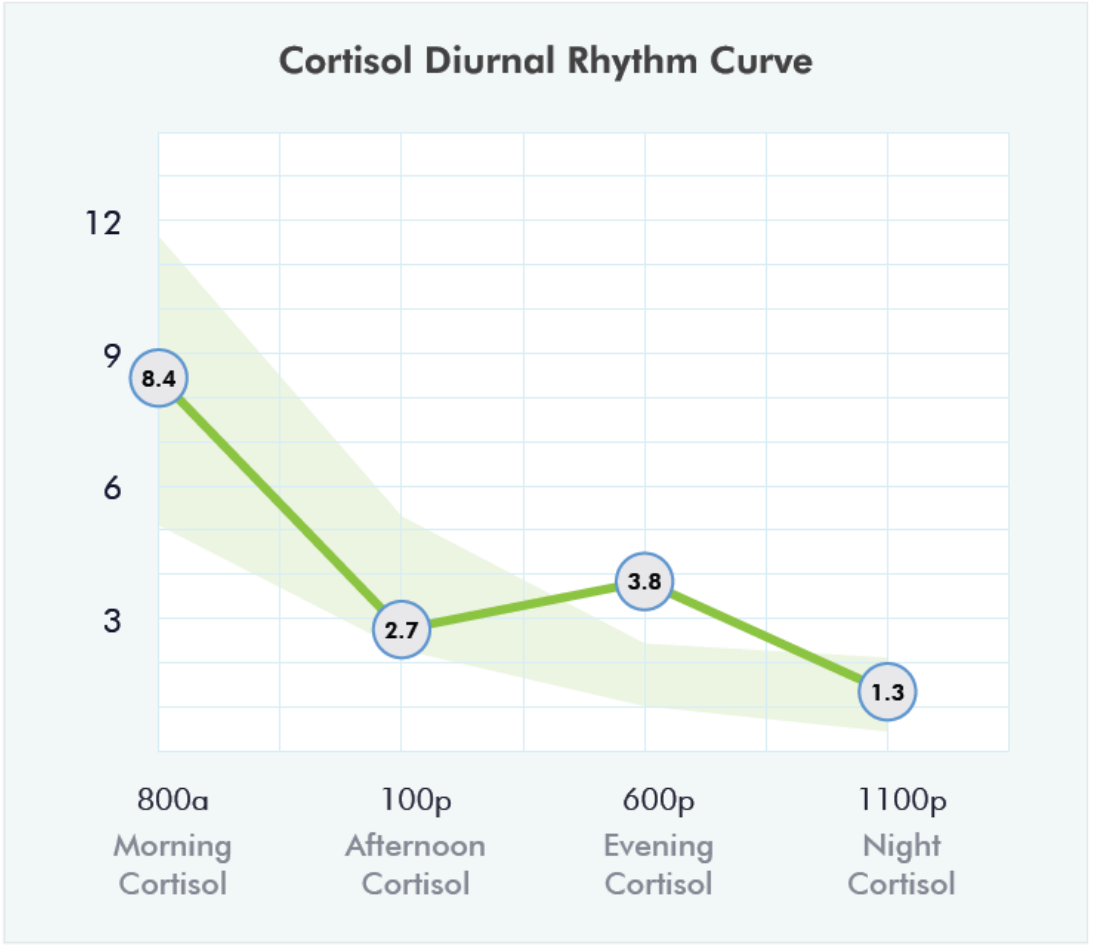


Sanesco® health in balance

Case Study

F, Age 21 Baseline

Morning Cortisol Reference Range 5.1 - 11.6 nM	800a 8.4	8.4
Afternoon Cortisol Reference Range 2.3 - 5.3 nM	100p 2.7	2.7
Evening Cortisol Reference Range 1 - 2.4 nM	600p 3.8 H	3.8
Night Cortisol Reference Range 0.4 - 2.1 nM	1100p 1.3	1.3
Morning DHEA-s Reference Range 1 - 6.0 ng/mL	800a 5.3	5.3
Afternoon DHEA-s Reference Range 1 - 6.0 ng/mL	600p 5.0	5.0



Sanesco®
health in balance

Case Study

F, Age 21 Baseline

Prolent™
For serotonin support: 5-HTP, Suntheanine®, Glycine, Vitamin B6, and Neuro Support Blend™

x 1 in the PM for serotonin support, based on the clinician's assessment and judgment may increase to x 2 after 10 days if needed. Use caution with SSRIs, anti-depressants, and other serotonergic medications, supplements, or substances. If taking Tranquilent™, consider a lower dose.

Lentra™
For GABA support: Magnesium Bisglycinate, Taurine, Suntheanine®, Lactium®, and Neuro Support Blend™

x 1 twice daily for GABA support, based on the clinician's assessment and judgment may increase to three times daily after 10 days if needed. Use caution with GABAergic or CNS depressant medications or substances, such as anxiolytics, anti-convulsants, opioids, muscle relaxants, and nerve pain medication. Additionally, use caution with medications or substances that lower blood pressure.

Tranquilent™
For mood support: Low doses of 5-HTP and Suntheanine®, with Myo-Inositol.

x 1 – 2 as needed for anxiousness or mood support. Do not exceed 4 tablets per day. Use caution with SSRIs, anti-depressants, and other serotonergic medications, supplements, or substances. If taking Prolent™, consider a lower dose. NOTE: Limited data suggests inositol may lower blood sugar. Use caution in hypoglycemia, diabetes, or insulin use.

SomniTR™
For sleep support: Time-release Melatonin, Lactium®, Coleus forskohlii, and Pantethine.

x 1 before bed for sleep support, based on the clinician's assessment and judgment may increase to x 2 after 3-5 days if needed. Use caution with sedative sleep medications, supplements, or substances. May not be necessary if taking Prolent™ or Lentra™ at night.

Contegra™
For HPA function support: Suntheanine®, N-Acetyl-L-Tyrosine, Siberian Ginseng Extract, Iodine, Betaine, Quatrefolic®, Vitamin B6, Vitamin B12, Pantothenic Acid, Neuro Support Blend™

After 7 days of inhibitory neurotransmitter support, x 1 in the AM for catecholamine support. Use caution with dopaminergic or noradrenergic medications, such as SNRIs, DNRIs, and stimulant medications. If anxiousness and poor sleep are concerns, or if taking Procite-D™, consider a lower dose.

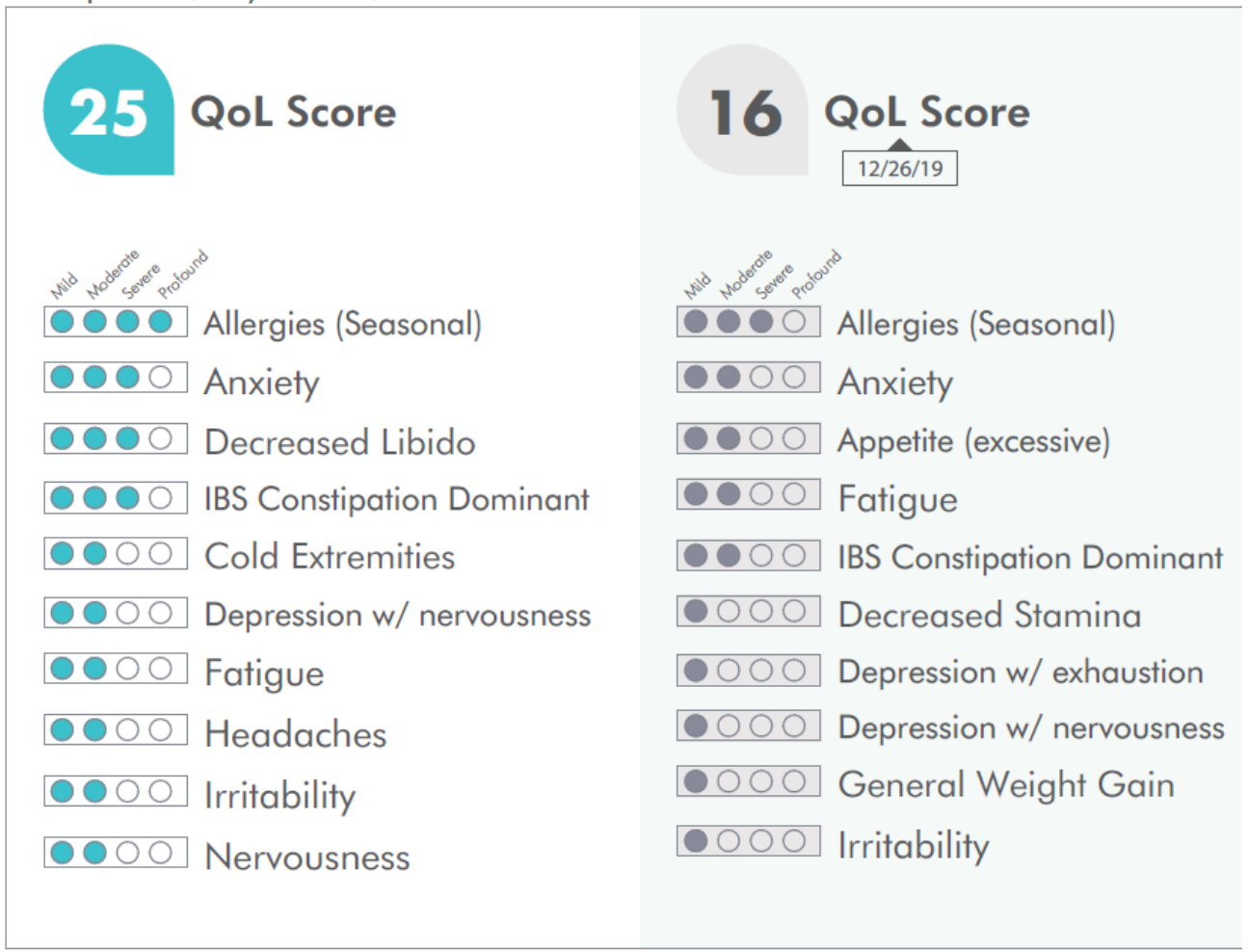
Procite-D™
For dopamine support: Mucuna pruriens, N-Acetyl-L-Tyrosine, DL-Phenylalanine, N-Acetyl-L-Cysteine, Quatrefolic®, Selenium, Vitamin B6, Vitamin B12, Neuro Support Blend™

After 14 days of inhibitory neurotransmitter support, x 1 in the AM for dopamine support; based on the clinician's assessment and judgment, may increase to x 2 after 10 days if needed. Use caution with dopaminergic or noradrenergic medications, such as SNRIs, DNRIs, and stimulant medications. If anxiousness and poor sleep are concerns or the PEA level is high, consider a lower dose.

Case Study

F, Age 21 Retest

Self Reported Quality-of-Life Questionnaire



Sanesco®
health in balance

Case Study

F, Age 21 Retest

- 1 yr later
- Rx
  - Zyrtec
  - GABA
  - Theanine
  - 5-HTP
  - Mg
  - Probiotics
  - Pregnenolone
  - E-lyte
  - DFH multivitamin

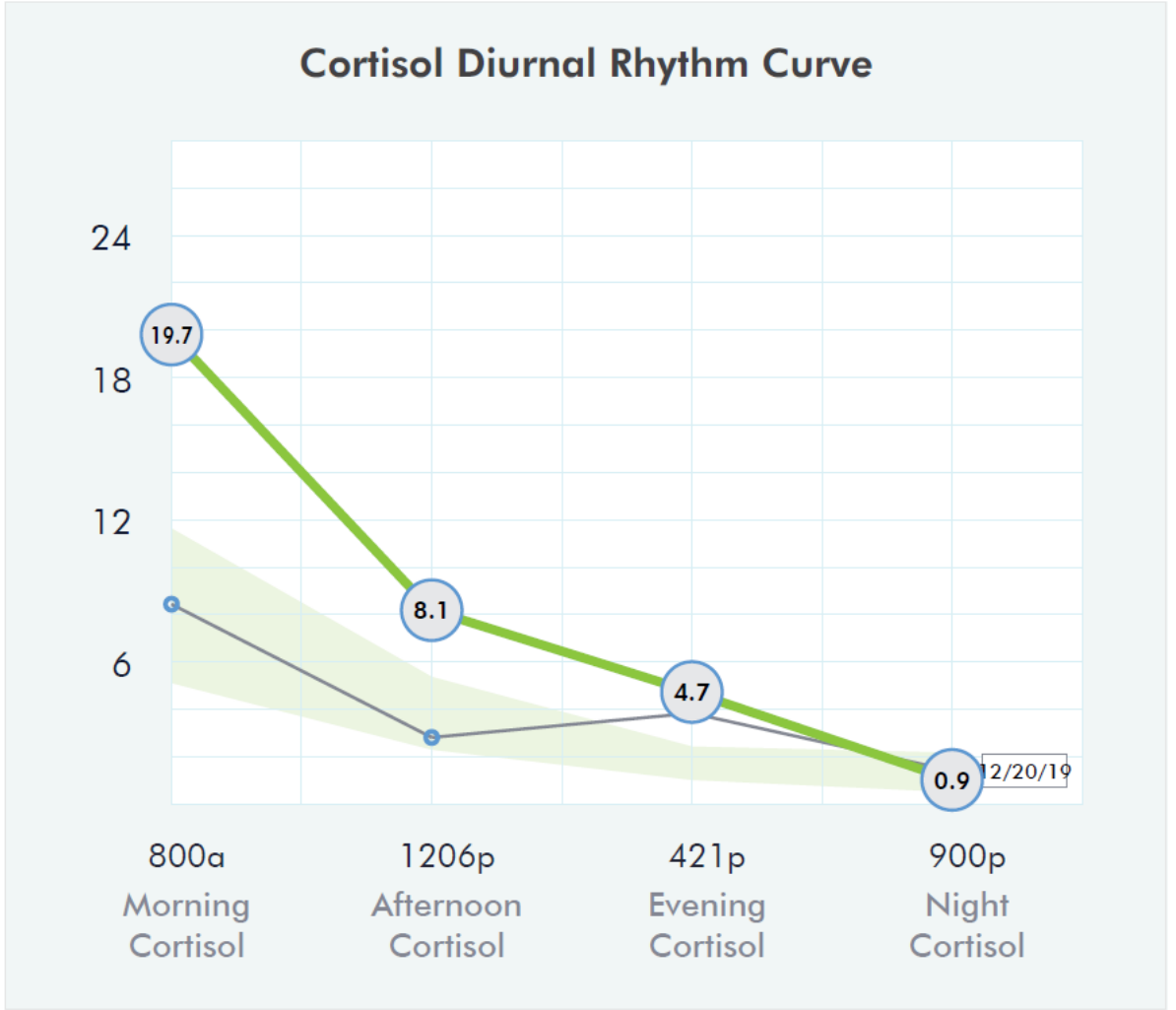
Biomarker	Current Value	Previous Value	Optimal/Reference Range Guide
Serotonin	444.5 H	93.9 L	Optimal Range 125 - 260 ug/g Cr; Reference Range 50 - 250 ug/g Cr
GABA	334.4 L	164.3 L	Optimal Range 600 - 1100 ug/g Cr; Reference Range 150 - 700 ug/g Cr
Dopamine	121.1 L	204.7 L	Optimal Range 250 - 400 ug/g Cr; Reference Range 100 - 350 ug/g Cr
Norepinephrine	16.0 L	19.9 L	Optimal Range 30 - 50 ug/g Cr; Reference Range 13 - 70 ug/g Cr
Epinephrine	4.1 L	1.8 L	Optimal Range 10 - 15 ug/g Cr; Reference Range 3 - 20 ug/g Cr
Glutamate	3.2 L	3.9 L	Optimal Range 5 - 10 mg/g Cr; Reference Range 2 - 12 mg/g Cr
PEA	1.9	N/A	Reference Range 1.64 - 7.27 mcg/g Cr

Sanesco® health in balance

Case Study

F, Age 21 Retest

Morning Cortisol Reference Range 5.1 - 11.6 nM	800a 19.7 H	8.4	19.7 12/20/19
Afternoon Cortisol Reference Range 2.3 - 5.3 nM	1206p 8.1 H	2.7	8.1 12/20/19
Evening Cortisol Reference Range 1 - 2.4 nM	421p 4.7 H	3.8 H	4.7 12/20/19
Night Cortisol Reference Range 0.4 - 2.1 nM	900p 0.9	1.3	0.9 12/20/19
Morning DHEA-s Reference Range 1 - 6.0 ng/mL	800a 2.4	5.3	2.4 12/20/19
Afternoon DHEA-s Reference Range 1 - 6.0 ng/mL	421p 2.6	5.0	2.6 12/20/19



Sanesco® health in balance

Case Study

F, Age 21 Retest

Lentra™

For GABA support: Magnesium Bisglycinate, Taurine, Suntheanine®, Lactium®, and Neuro Support Blend™

x 1 twice daily for GABA support, based on the clinician's assessment and judgment may increase to three times daily after 10 days if needed. Use caution with GABAergic or CNS depressant medications or substances, such as anxiolytics, anti-convulsants, opioids, muscle relaxants, and nerve pain medication. Additionally, use caution with medications or substances that lower blood pressure.

Contegra™

For HPA function support: Suntheanine®, N-Acetyl-L-Tyrosine, Siberian Ginseng Extract, Iodine, Betaine, Quatrefolic®, Vitamin B6, Vitamin B12, Pantothenic Acid, Neuro Support Blend®

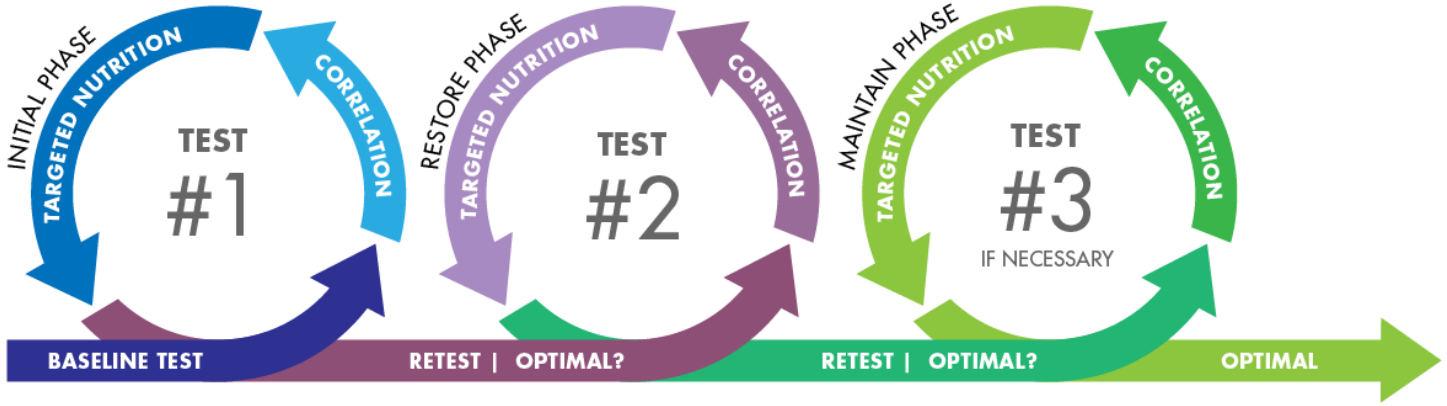
After 7 days of inhibitory neurotransmitter support, x 1 in the AM for catecholamine support. Use caution with dopaminergic or noradrenergic medications, such as SNRIs, DNRIs, and stimulant medications. If anxiousness and poor sleep are concerns, or if taking Procite-D™, consider a lower dose.

Procite-D™

For dopamine support: Mucuna pruriens, N-Acetyl-L-Tyrosine, DL-Phenylalanine, N-Acetyl-L-Cysteine, Quatrefolic®, Selenium, Vitamin B6, Vitamin B12, Neuro Support Blend®

After 14 days of inhibitory neurotransmitter support, x 1 in the AM for dopamine support; based on the clinician's assessment and judgment, may increase to x 2 after 10 days if needed. Use caution with dopaminergic or noradrenergic medications, such as SNRIs, DNRIs, and stimulant medications. If anxiousness and poor sleep are concerns or the PEA level is high, consider a lower dose.

NeuroWellness Program Process



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Sanesco®
health in balance

CARE Package Add-On

Analysis and Intervention

NeuroLab
A Division of Sanesco International

Path to Optimal Wellness

NeuroWellness Program™ Approach

Neuroendocrine Testing

- Lays out the most direct path to optimal health

Personalized Analysis

- The CARE package provides information connecting patient results to clinical concerns

Targeted Nutritional Therapy™

- Formulas provide only what is needed to address patient-specific imbalances

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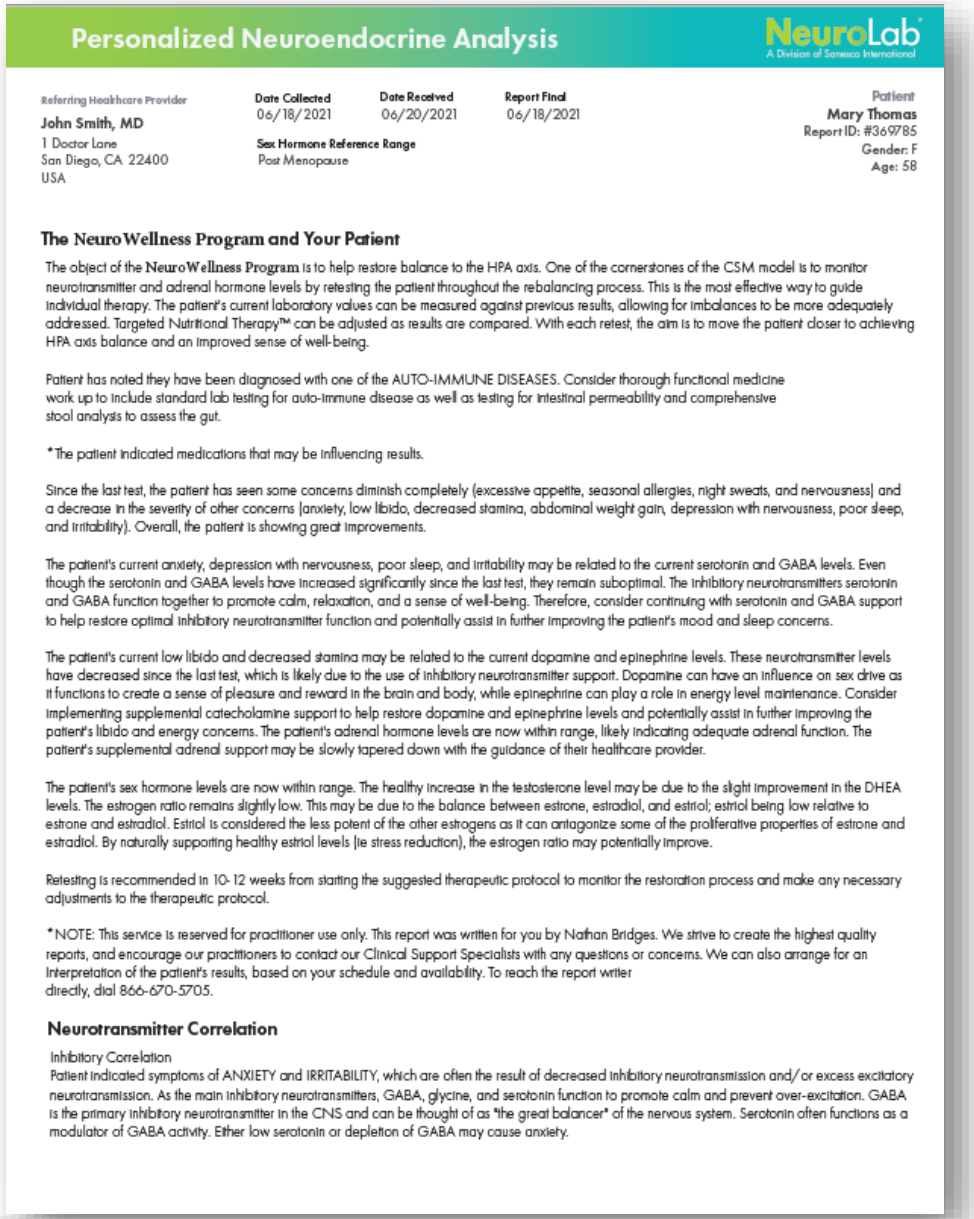

Personalized Neuroendocrine Analysis

NeuroLab
A Division of Sanesco International

Referring Healthcare Provider
John Smith, MD
1 Doctor Lane
San Diego, CA 22400
USA

Date Collected 06/18/2021
Date Received 06/20/2021
Report Final 06/18/2021
Sex Hormone Reference Range
Post Menopause

Patient
Mary Thomas
Report ID: #369785
Gender: F
Age: 58

The NeuroWellness Program and Your Patient

The object of the **NeuroWellness Program** is to help restore balance to the HPA axis. One of the cornerstones of the CSM model is to monitor neurotransmitter and adrenal hormone levels by retesting the patient throughout the rebalancing process. This is the most effective way to guide individual therapy. The patient's current laboratory values can be measured against previous results, allowing for imbalances to be more adequately addressed. Targeted Nutritional Therapy™ can be adjusted as results are compared. With each retest, the aim is to move the patient closer to achieving HPA axis balance and an improved sense of well-being.

Patient has noted they have been diagnosed with one of the AUTO-IMMUNE DISEASES. Consider thorough functional medicine work up to include standard lab testing for auto-immune disease as well as testing for intestinal permeability and comprehensive stool analysis to assess the gut.

*The patient indicated medications that may be influencing results.

Since the last test, the patient has seen some concerns diminish completely (excessive appetite, seasonal allergies, night sweats, and nervousness) and a decrease in the severity of other concerns (anxiety, low libido, decreased stamina, abdominal weight gain, depression with nervousness, poor sleep, and irritability). Overall, the patient is showing great improvements.

The patient's current anxiety, depression with nervousness, poor sleep, and irritability may be related to the current serotonin and GABA levels. Even though the serotonin and GABA levels have increased significantly since the last test, they remain suboptimal. The inhibitory neurotransmitters serotonin and GABA function together to promote calm, relaxation, and a sense of well-being. Therefore, consider continuing with serotonin and GABA support to help restore optimal inhibitory neurotransmitter function and potentially assist in further improving the patient's mood and sleep concerns.

The patient's current low libido and decreased stamina may be related to the current dopamine and epinephrine levels. These neurotransmitter levels have decreased since the last test, which is likely due to the use of inhibitory neurotransmitter support. Dopamine can have an influence on sex drive as it functions to create a sense of pleasure and reward in the brain and body, while epinephrine can play a role in energy level maintenance. Consider implementing supplemental catecholamine support to help restore dopamine and epinephrine levels and potentially assist in further improving the patient's libido and energy concerns. The patient's adrenal hormone levels are now within range, likely indicating adequate adrenal function. The patient's supplemental adrenal support may be slowly tapered down with the guidance of their healthcare provider.

The patient's sex hormone levels are now within range. The healthy increase in the testosterone level may be due to the slight improvement in the DHEA levels. The estrogen ratio remains slightly low. This may be due to the balance between estrone, estradiol, and estriol; estriol being low relative to estrone and estradiol. Estriol is considered the less potent of the other estrogens as it can antagonize some of the proliferative properties of estrone and estradiol. By naturally supporting healthy estriol levels (ie stress reduction), the estrogen ratio may potentially improve.

Retesting is recommended in 10-12 weeks from starting the suggested therapeutic protocol to monitor the restoration process and make any necessary adjustments to the therapeutic protocol.

*NOTE: This service is reserved for practitioner use only. This report was written for you by Nathan Bridges. We strive to create the highest quality reports, and encourage our practitioners to contact our Clinical Support Specialists with any questions or concerns. We can also arrange for an interpretation of the patient's results, based on your schedule and availability. To reach the report writer directly, dial 866-670-5705.

Neurotransmitter Correlation

Inhibitory Correlation
Patient indicated symptoms of ANXIETY and IRRITABILITY, which are often the result of decreased inhibitory neurotransmission and/or excess excitatory neurotransmission. As the main inhibitory neurotransmitters, GABA, glycine, and serotonin function to promote calm and prevent over-excitation. GABA is the primary inhibitory neurotransmitter in the CNS and can be thought of as "the great balancer" of the nervous system. Serotonin often functions as a modulator of GABA activity. Either low serotonin or depletion of GABA may cause anxiety.

Unpacking the CARE Package

Personalized Correlation Analysis & Education

- Correlates patient complaints listed on their Quality-of-Life Questionnaire with the test results
- Provides in-depth education regarding imbalances and patient symptoms
- Can be shared with patient

Quality of Life (QoL) Score & Insights

NeuroLab
A Division of Sanesco International

Referring Healthcare Provider
John Smith, MD
1 Doctor Lane
San Diego, CA 22400
USA

Date Collected: 06/18/2021
Date Received: 06/20/2021
Report Final: 06/18/2021
Sex Hormone Reference Range: 06/20/2021

Patient
Mary Thomas
Report ID: #369785
Gender: F
Age: 58

Self Reported Quality-of-Life Questionnaire

6 QoL Score	15 QoL Score 5/1/17	24 QoL Score 3/12/17
Anxiety	Anxiety	Anxiety
Decreased Libido	Decreased Libido	Decreased Libido
Decreased Stamina	Decreased Stamina	Decreased Stamina
Abdominal Weight Gain	Abdominal Weight Gain	Abdominal Weight Gain
Poor Sleep	Depression	Depression
Irritability	Poor Sleep	Poor Sleep
	Irritability	Irritability
	Lack of Focus	Lack of Focus
	Insomnia	Insomnia
		Nervousness

Important Insights

- Since the last test, the patient has seen some concerns diminish completely (excessive appetite, seasonal allergies, night sweats, and nervousness) and a decrease in the severity of other concerns (anxiety, low libido, decreased stamina, abdominal weight gain, depression with nervousness, poor sleep, and irritability). Overall, the patient is showing great improvements.
- Patient has noted they have been diagnosed with one of the AUTO-IMMUNE DISEASES. Consider thorough functional medicine work up to include standard lab testing for auto-immune disease as well as testing for intestinal permeability and comprehensive stool analysis to assess the gut.

Unpacking the CARE Package

Quality-of-Life Score & Insights

- Based on self-reported patient Quality-of-Life Questionnaire
- Shows patient progress based on their own sense of wellness
- Helps to improve compliance
- Shares insights into the patient's quality of life as well as additional impacting factors for your consideration

Targeted Nutritional Therapy™ Considerations

Sanesco health in balance

Referring Healthcare Provider
John Smith, MD
1010 Merrimon Ave.
Asheville, NC 28804
USA

Date Collected 06/18/2021
Date Received 06/20/2021
Report Final 06/18/2021
Sex Hormone Reference Range 06/20/2021

Patient
Mary Thomas
Report ID: #369785
Gender: M
Age: 22

Targeted Nutritional Therapy™ (TNT) Considerations

Prolent™
For serotonin support*: 5-HTP, Suntheanine®, Glycine, Vitamin B6, and Neuro Support Blend™
Targeted Consideration: decrease to x 1 capsule in the PM

Lentra™
For GABA support*: Magnesium Bisglycinate, Taurine, Suntheanine®, Lactium®, and Neuro Support Blend™
Targeted Consideration: continue with x 1 capsule twice daily

Procite-D™
For dopamine support*: Mucuna pruriens, N-acetyl-L-tyrosine, DL-phenylalanine, N-Acetyl-L-Cysteine, Quatrefolic®, Selenium, Vitamin B6, Vitamin B12, Neuro Support Blend™
Targeted Consideration: implement x 1 capsule in the AM

Adaptacin™
For adrenal support*: Bovine adrenal cortex, Licorice extract, Ashwagandha extract, Panax Ginseng, Siberian Ginseng Extract, Vitamin C, Pantothenic Acid, Magnesium, Zinc, Neuro Support Blend™
Targeted Consideration: Decrease to x 1 tablet every other day in the AM

Contegra™
For HPA function support*: Suntheanine®, N-Acetyl-L-Tyrosine, Siberian Ginseng Extract, Iodine, Betaine, Quatrefolic®, Vitamin B6, Vitamin B12, Pantothenic Acid, Neuro Support Blend™
Targeted Consideration: implement x 1 capsule in the AM

Additional Considerations

Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua.

TARGETED NUTRITIONAL THERAPY

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

Sanesco International | 2 Trident Drive, Arden, NC 28704 | Phone: 866.670.6705 | support@sanescohealth.com

Unpacking the CARE Package

Targeted Nutritional Therapy™

- Nutritional formulas recommended based on patient test results and clinical concerns
- Additional nutritional considerations provided

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Targeted Nutritional Therapy™

Neuroendocrine Support Formulas*

*These statements have not been evaluated by the Food and Drug Administration.
This product is not intended to diagnose, treat, cure or prevent any disease.

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Quality

Targeted Nutritional Therapy™ (TNT)

- All TNT formulas are manufactured at a cGMP facility
- All TNT formulas are:
  - Free of gluten
  - Non-GMO
  - Free of hydrogenated or partially hydrogenated fats/oils
  - Free of allergens such as:
    - Peanuts, tree nuts, soy, wheat, yeast, shellfish, fish, eggs, artificial preservatives or sugars
- Formulated using high-quality branded ingredients

TARGETED
NUTRITIONAL THERAPY

Quality

NeuroSupport Blend™ (NSB)

- At the base of most TNT™ formulas
- NSB™ - proprietary blend of digestive enzymes, including:
  - Protease
  - Lipase
  - Amylase
- Bioperine® - Enhances the GI uptake of nutrients by:
  - Increasing blood supply to the GI tract*
  - Emulsifying contents of the gut*
  - Actively transporting nutrients across gut wall into bloodstream*

BioPerine®

Bioperine® is a registered trademark of Sabinsa.

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Overview

Neurotransmitter Balancing "Filling the Tank"

- Only amino acid precursors replete neurotransmitter reserves
- SSRIs/SNRIs do not "fill the tank" but rather improve neurotransmitter function by slowing neurotransmitter reuptake
- Appropriately balancing hormones will make neurotransmitters work more efficaciously

TNT

Inhibitory Formulas

Prolent™

- Inhibitory formula*
  - Support for three inhibitory neurotransmitters (serotonin, GABA, glycine)*
  - Vitamins supporting neurotransmitter synthesis*
  - NeuroSupport blend

Lentra™

- GABA receptor formula*
  - Supports GABA in multiple ways*
  - NeuroSupport blend

Tranquilent™

- Chewable inhibitory support*
  - Serotonin
  - GABA
  - Receptor health

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

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TNT

Excitatory Formulas

Contegra™

- HPA-T Balancing Formula*
- Inhibitory/excitatory balance support*
- Thyroid support*
- Adrenal support*
- Methylation support*
- NeuroSupport blend

Procite-D™

- Catecholamine Formula*
  - Catecholamine precursors
  - Vitamins and minerals supporting catecholamine synthesis*
  - Neuroprotectant*
  - NeuroSupport blend

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

NeuroLab
A Division of Sanesco International

TNT

Specialty Formulas

Adaptacin™

- Adrenal support formula*
  - Direct cortisol support*
  - Adrenal adaptogens*
  - Vitamins and minerals support adrenal health*
  - NeuroSupport blend

SomniTR™

- Delayed-release sleep formula*
  - Direct melatonin support*
  - Support for melatonin synthesis*
  - GABA support*

MethylMax™

- Comprehensive methylation support formula*
  - Key components of the methylation cycle
  - Methyl donors*

*These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

NeuroLab
A Division of Sanesco International

TNT Tips

Good to Know

- All supplements containing amino acids are best taken on an empty stomach
- "Start low and go slow" philosophy
- Response time varies by patient

Sanesco®
health in balance

Get Started

Implement in Your Practice

NeuroLab
A Division of Sanesco International

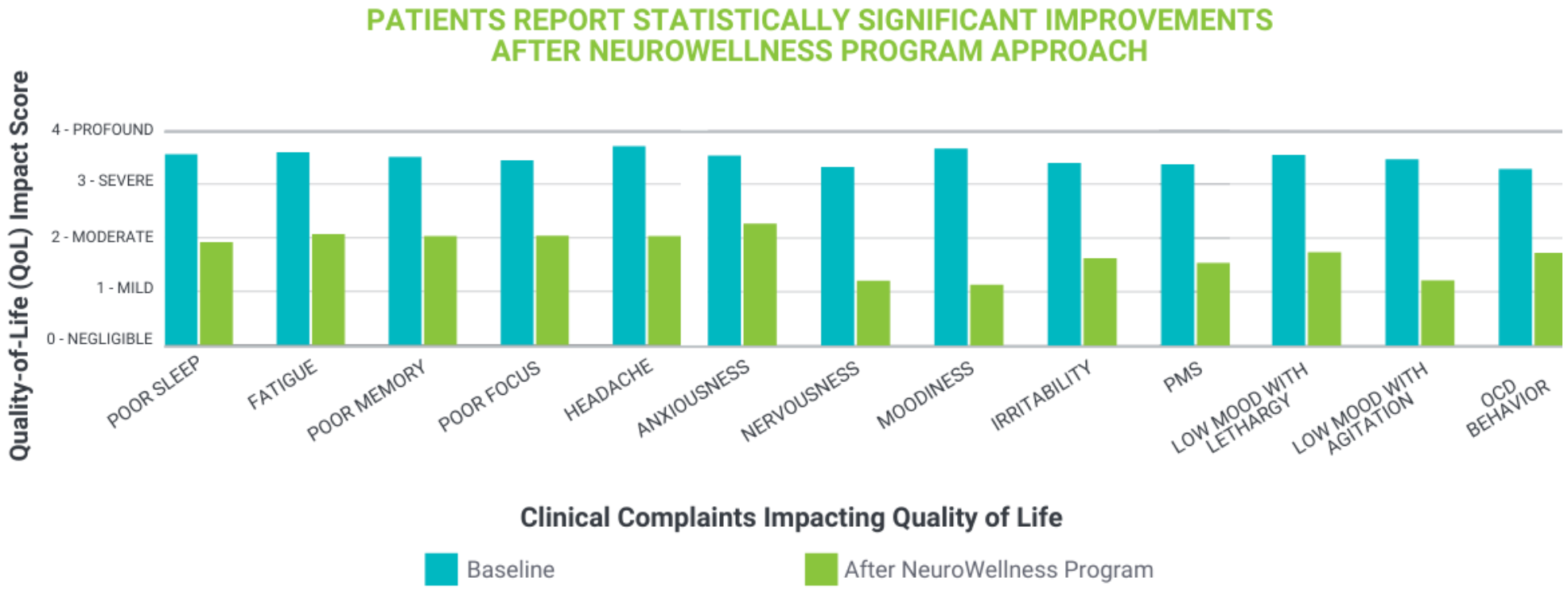
Get Started

Neuroendocrine Balance

- An imbalance in any *one* aspect of neurotransmitter or hormone system leads to a compensatory imbalance of both systems
- Imbalance perpetuates imbalance
- Re-establishment of optimal balance IS possible
- Assessment is accomplished through serum and saliva hormone levels and urinary levels of Neurotransmitters, along with clinical improvements

Get Started

Choose Your Patients



*Self-reported QoL scores on a 4-point Likert Scale, p<0.05

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Get Started

Recommended Profiles

HPA-G Complete

7 neurotransmitters

2 adrenal hormones
(4-pt cortisol, 2-pt DHEA-S)

5 sex hormones

Recommended for individuals >40 years or experiencing hormone-related complaints

HPA

7 neurotransmitters

2 adrenal hormones
(4-pt cortisol, 2-pt DHEA-S)

Sanesco®
health in balance

NeuroWellness Program for Your Practice

Question and Answer Session

Anup Kanodia, MD, MPH, IFMCP
www.KanodiaMD.com
(614) 524-4527

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Quality-of-Life Concerns

Protective Beliefs about Stress

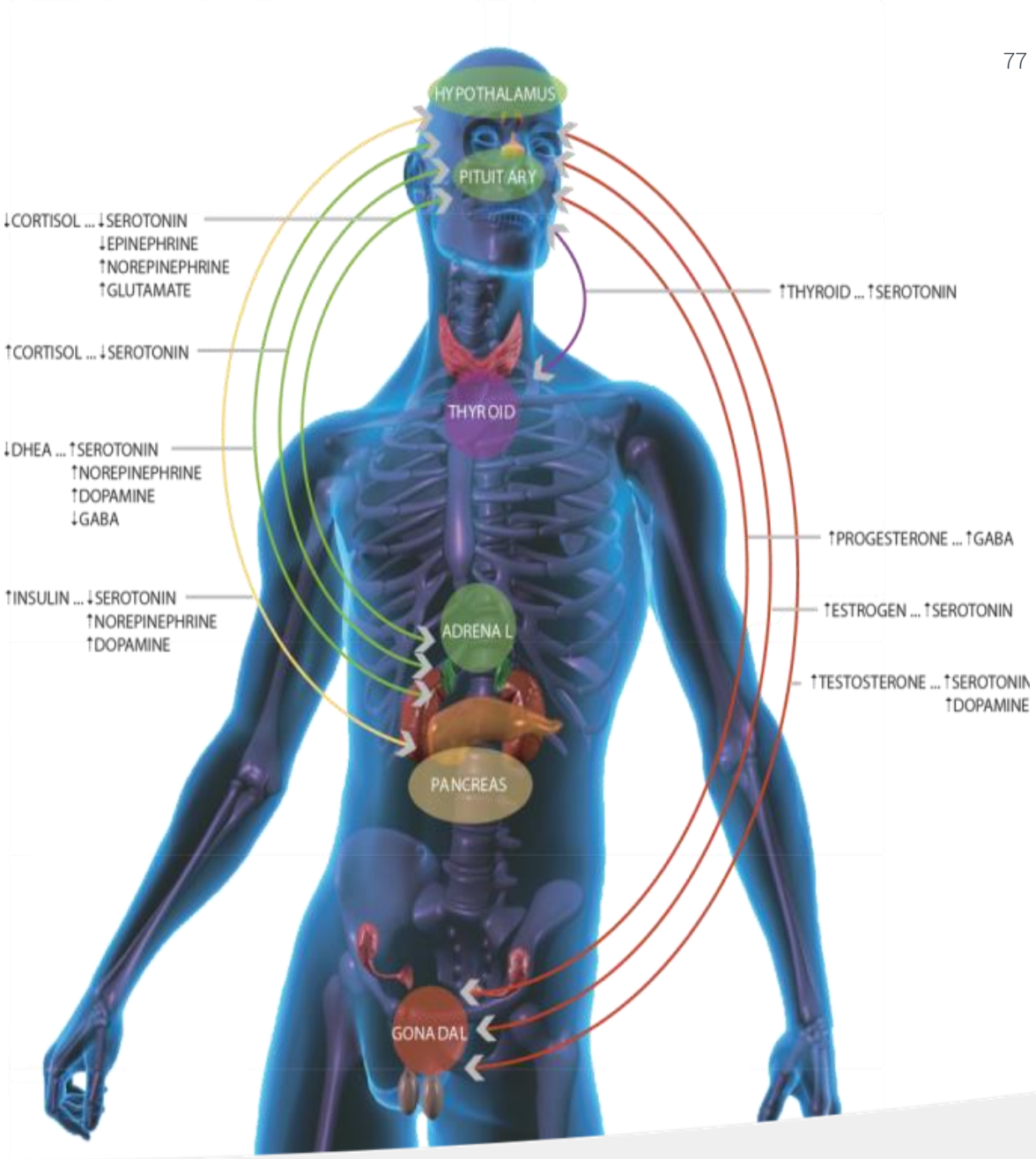
1. View your body's stress response as helpful, not debilitating –view stress as energy you can use
2. View yourself as able to handle, and even learn and grow from, the stress in your life
3. View stress as something that everyone deals with and not something that proves how uniquely screwed up you or your life are

https://news.stanford.edu/2015/05/07/stress-embrace-mcgonigal-050715/

Health in Balance

Path to Optimal Wellness

- Optimal neuroendocrine health depends on balance between inhibitory and excitatory neurotransmitters.
  - Inhibitory neurotransmission controls excitability and allows for calm, relaxation and sleep
  - Excitatory neurotransmission is essential for energy, focus and motivation
  - Inhibitory and excitatory neurotransmitters interact with adrenal and sex hormones
- Clinical complaints begin to manifest when imbalance in the two systems is present.



Sanesco® health in balance

Health in Balance

Low Mood and Cortisol

- 50% of patients with new symptoms of low mood have excess cortisol secretion
- Low mood is accompanied by:
  - Dysregulation of the HPA axis
  - Abnormal thyroid function
  - Sex hormone dysregulation during the postpartum and postmenopausal periods

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8584322/

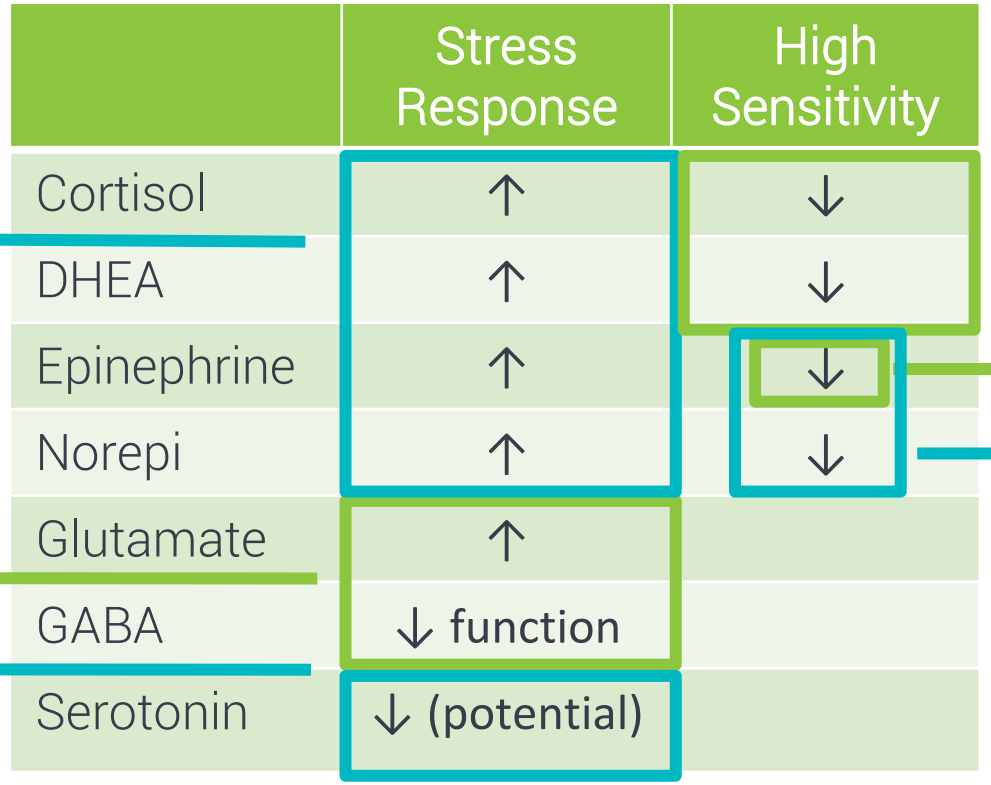
Calm and Resilience

Adrenal/Neurotransmitter Interactions

Adrenal hormones and neurotransmitters increase in response to stress

Elevated DHEA is associated with suppression of GABA function and potentiation of glutamate

Elevated cortisol may suppress serotonin further contributing to stress



Changes in sensitivity to negative feedback can alter activity or levels

Cortisol is needed for epinephrine synthesis

Norepinephrine and epinephrine become desensitized to stressor, lowering their activity/ release from the adrenal

Sanesco® health in balance

Summary Low Mood with Agitation or Lethargy

- Low serotonin
- Elevated catecholamines
- Elevated glutamate
- Elevated cortisol
- Elevated thyroid

- Low blood RBC
- Low serum ferritin
- Low EPA
- Increased inflammatory cytokines
- Low DHEA

- Low catecholamines
- Low cortisol
- Low thyroid

Sanesco® health in balance