Join the Millennium-TBI Network

Unlock the Future of Neurotrauma Recovery

In a world where veterans, first responders, athletes, and civilians are silently battling the long-term consequences of neurotrauma, the need for precision diagnostics and therapeutics has never been greater. The Millennium-TBI Network is a groundbreaking initiative committed to changing the landscape of neuroendocrine and neuroinflammatory care—one provider at a time.

Why Join?

Most patients with traumatic brain injury (TBI), post-concussive syndrome, PTSD, or long-standing emotional and cognitive dysfunction are dismissed with "normal" labs and cookie-cutter treatment protocols. The Millennium 28-Point Biomarker Panel breaks this mold. Each test was selected based on decades of research into the pathophysiology of trauma-induced neuroendocrine dysfunction, immune disruption, and neurotransmitter imbalance.

Unlike standard panels that examine thyroid-stimulating hormone (TSH) or cortisol in isolation, the Millennium Panel evaluates hormonal interdependence, cytokine signaling, neurosteroid reserve, mitochondrial function, and anabolic-catabolic balance—creating a holistic view of the patient's internal recovery landscape.

The Power of MOA: Decades of Clinical Insight—Delivered Instantly

The MOA (Millennium Office Laboratory Assistant) is not just software—it is a clinical co-pilot trained on thousands of real cases. Drawing from deep pattern recognition and tiered analytical matrices, MOA dissects each biomarker and evaluates its interaction with the entire panel. It flags insufficiencies, pathophysiological patterns, and hidden disease processes—many of which would go undetected by traditional approaches or would require a decade of specialty training to master.

Empowerment Through Data, Transformation Through Action

With this system in place, clinicians can provide personalized, mechanism-based care for patients whose conditions have long defied explanation. Whether it's a retired Special Forces operator struggling with emotional volatility, a firefighter with chronic fatigue and insomnia, or a high school athlete experiencing cognitive decline post-concussion—the Millennium model offers answers and solutions rooted in measurable biochemistry.

Accelerated Learning Curve for Providers

Most healthcare professionals require years of post-graduate training to gain fluency in neuroendocrinology, immune modulation, and trauma pharmacology. The MOA bridges this gap. It accelerates your clinical expertise, giving you a level of diagnostic sophistication typically found in tertiary care academic centers or among subspecialists.

Who Should Join?

Physicians in private practice or integrative clinics; Veterans Affairs (VA) and DoD-affiliated clinicians; Sports medicine and performance enhancement specialists; Functional and regenerative medicine providers; Primary care doctors seeking to better serve complex patients; Allied health professionals seeking objective insight into trauma, burnout, and cognitive decline. In essence, any healthcare provider that would like to rise above the common and usual, limited approach to wellness and the return to healthy living.

Real Recovery. Real Data. Real Change.

The Millennium Protocol is not based on hope—it's based on data. With over 3,000 veterans and civilians assessed using this system, outcomes speak for themselves. Restoration of mood, memory, libido, energy, and cognitive clarity has been the norm—not the exception.

Join Us

By becoming part of the Millennium-TBI Network, you will gain: Access to the 28-Point Biomarker Panel; Full integration with the MOA interpretive system; Ongoing clinical education and training resources; Support from a like-minded community of cutting-edge providers; Direct referral and collaboration opportunities with the Warrior Angels Foundation and affiliated veteran support programs.

Conclusion

The future of trauma-informed, neuroendocrine care is already here. The only question is—will you be part of it? Join the Millennium-TBI Network and become a leader in precision recovery medicine. Together, we can help restore the minds and lives of those who have served, suffered, and survived.

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Laboratory Date: 06/03/2024 **Lab Provider:** Access Medical Labs **Report Date:** 06/12/2024

MILLENNIUM

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Laboratory Results and Interpretation

General guidelines for our laboratory grading system (how we interpret the laboratory's results) address the importance of having Optimal Levels of each test. Low: The result is below the standard range for normal, therefore abnormal. Low-Normal: The result is in the 1st quartile of the laboratory's range (0-25%). Normal: The result is between the 2nd and 3rd quartile of the laboratory's range (26-74%). Optimal: This is 5% above and below the median of the laboratory's range. High-Normal: This is the 4th Quartile of the laboratory's range (76-100%). High: The result is above the standard range for normal, therefore abnormal.
Note: Medical conditions and medication can alter these statements of interpretation.

Growth Hormone — Past Results

HIGH NORMAL
Range: 92.5%

Date	Result	Range
11/22/2023	0.47	5.8% LOW NORMAL
02/28/2024	0.9	11.1% LOW NORMAL

Diagnosis: Normal GH w/ High IGF-1 Level on SRx
Clinical Support: No Intervention for GH on SRx.

Growth Hormone regulates growth and repair while influencing the production of other hormones. Important to the brain's chemistry, GH modulates pro-inflammatory cytokines, helps with repair and enhancement of neurons with improved cellular functioning. Its peak production is between 8pm and 4am during which time it has direct effects on bone metabolism, immune system, vitamin D metabolism, protein synthesis, neuronal growth, repair, and influences psychiatric behavior.
Note: Morning levels of GH are anticipated to be in the Low to Low-normal ranges.

IGF-1 — Past Results

HIGH
Range: 276.4%

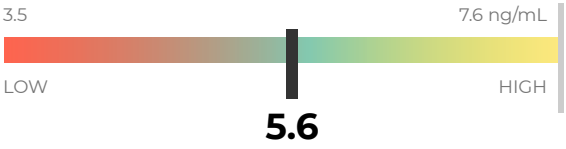
Date	Result	Range
11/22/2023	122	-38.9% LOW
02/28/2024	180	41.7% LOW NORMAL

Diagnosis: High IGF-1 level on SRx Protocol. Verify ALL medications.
Clinical Support: DECREASE: SRx if indicated. Verify ALL medications.

Insulin-like Growth Factor-1 is an important hormone produced under growth hormone's stimulation of the liver. IGF-1 enhances protein synthesis leading to healing, growth, and repair of tissues throughout the body. Additionally, IGF-1 reduces inflammatory chemicals like homocysteine while improving muscle protein synthesis for growth and healing, enhances cognition via improved neurotransmitter production and glucose absorption by neurons.
Note: An ideal range of IGF-1 is Optimal.

IGFBP-3

Past Results



OPTIMAL
Range: 51.2%

Date	Result	Range
11/22/2023	5.23	42.2% LOW NORMAL
02/28/2024	5.8	56.1% HIGH NORMAL

Diagnosis: Optimal IGF-BP3 Level on Secretagogue Protocol (SRx).
Clinical Support: No Intervention for IGFBP-3.

There are a total of 7 different Binding Proteins of which BP-3 is the most reviewed since it is the direct carrier of IGF-1. By carrying IGF-1, BP-3 increases its availability from minutes to 24 hours. BP-3's presence in the blood has also been found to reduce cancer risks along with BP-4. Growth hormone, estradiol, vitamin A and Quercetin can all increase the level of BP-3.
Note: An ideal range for IGFBP-3 is Optimal to High-normal based upon medical status.

DHEA-s

Past Results

OPTIMAL
Range: 54%

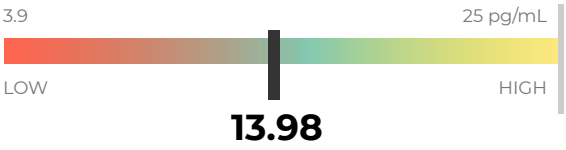
Date	Result	Range
11/22/2023	298.4	49.4% OPTIMAL
02/28/2024	410	70.3% HIGH NORMAL

Diagnosis: Optimal DHEA-s Level on present DHEA Protocol.
Clinical Support: No Intervention for DHEA-s on present DHEA Protocol.

DHEA is the form that circulates around the body while DHEA-s is the activated form in the brain. Both have been found to have cardioprotective properties especially for ischemic heart disease (IHD). Below the neck DHEA has been found to improve wound healing, sugar metabolism, anti-inflammatory effects, and stimulate the immune system. Above the neck DHEA-s stimulates oligodendrocytes to produce myelin, reduces pro-inflammatory cytokines, increases growth hormone production, and improves mood and physical activities.
Note: An ideal range for DHEA-s is Optimal to High-normal.

Free Testosterone

Past Results



OPTIMAL
Range: 47.8%

Date	Result	Range
11/22/2023	12.93	42.8% LOW NORMAL
02/28/2024	18.5	69.2% HIGH NORMAL

Diagnosis: Optimal Free Testosterone Level on Clomiphene Protocol.
Clinical Support: No Intervention for Free-T on Clomiphene Protocol.

This is the form of testosterone that is initially produced by ovarian Thecal cells and testicular Leydig cells. A unique property of free testosterone is that it passes through the blood brain barrier and into the brain. Once in the brain it modulates inflammation, memory, emotions, and cognitive abilities. Recent studies have found that deficiencies can cause panic and enhanced startle responses. This is the form of testosterone that needs to be optimized in both males and females.
Note: An ideal range for Free Testosterone is Optimal to High-normal.

Total Testosterone

Past Results

NORMAL
Range: 5%

Date	Result	Range
11/22/2023	571	35.5% NORMAL
02/28/2024	786	61.7% HIGH NORMAL

Diagnosis: Low-Normal Total-T on Clomiphene Protocol.
Clinical Support: See under Free Testosterone.

In terms of predicting optimal hormonal wellness, Total Testosterone is the least useful measurement since it represents mostly unusable forms of testosterone or forms that do not enter into the brain. Therefore, Free testosterone and not Total testosterone should be used as the guide for treatment. An elevated Total Testosterone can take away potential benefits from an optimal Free Testosterone level.
Note: An ideal range for Total Testosterone is Optimal.

Predicted Free-T

Past Results

ACCEPTABLE
Range: 217.8%

Date	Result	Range
11/22/2023	11.42	113.2% ACCEPTABLE
02/28/2024	15.72	117.7% ACCEPTABLE

Diagnosis: Optimal Free Testosterone w/normal conversion on Clomiphene.
Clinical Support: See under Free Testosterone.

A healthy Free Testosterone level is about 2% of the Total Testosterone measured. Due to changes in metabolic pathways, the level of Free Testosterone can become less than 2% because of rapid conversion to Estradiol, Dihydrotestosterone, Epitestosterone, and binding to Sex Hormone Binding Globulin. The loss of Free Testosterone means it ends up being a part of the Total Testosterone pool. If the amount of Predicted Free Testosterone is above the actual measured free testosterone level, then we have an issue with rapid conversion of the Free Testosterone into the Total Testosterone pool. On the converse, if the Predicted Free Testosterone is below the actually measured Free Testosterone level then we are preserving Free testosterone for passage into the brain. Selenium and Zinc deficiencies can allow for rapid conversion to DHT and Estradiol, respectively.
Note: An ideal range for Predicted Free Testosterone is Optimal to High-normal.

DHT

Past Results

HIGH
Range: 100.6%

Date	Result	Range
11/22/2023	44	38.9% LOW NORMAL
02/28/2024	52.3	48.8% OPTIMAL

Diagnosis: HIGH DHT. Verify no Topical TRT Therapy.
Clinical Support: Verify medication for presence of Topical TRT Therapy.

DHT is the activated form of testosterone and can be transported into the brain. Some articles consider DHT to be 10 times stronger than free testosterone in its general effects on cellular function. It has been shown to increase glucose transport into muscle cells for growth and repair, improvement in depression, and heart functioning. When DHT is elevated is responsible for thinning of hair, oily skin, acne, prostate enlargement, and reduction of the gonadal size. When topical testosterone is applied to the skin, an enzyme – 5-alpha Reductase – will convert it into DHT raising blood levels and risk for adverse side effects. Therefore, this hormone needs to be monitored.
Note: An ideal range for DHT is Optimal based upon medical conditions.

SHBG

Past Results

HIGH NORMAL
Range: 98.8%

Date	Result	Range
11/22/2023	38	29.6% LOW NORMAL
02/28/2024	55	50.6% OPTIMAL

Diagnosis: Acceptable SHBG Level on Clomiphene Protocol.
Clinical Support: No Intervention for SHBG on Clomiphene Protocol.

The production of SHBG, by the liver, is influenced by Free Testosterone which decreases it, and Estradiol and DHT that increase it. Therefore, the amount of SHBG measured is the net effect of Testosterone, DHT and Estradiol on the liver. Topical Testosterone will raise DHT causing elevation in SHBG because the hair follicles in the skin have the 5-Alpha reductase(5AR) enzyme that converts Testosterone to DHT. There are a number of medications that will also skew the production of SHBG like Metformin, Insulin, Spironolactone, BCP, Phenytoin, and the hormone Prolactin. Medication like finasteride and dutasteride are pharmaceutical products that block the 5-AR enzyme at two very important sites; the conversion of Testosterone to DHT and Progesterone to Allopregnanolone.
Note: An ideal range for SHBG is Optimal.

Estrone

Past Results

HIGH NORMAL
Range: 75%

Date	Result	Range
11/22/2023	56	93.3% HIGH NORMAL
02/28/2024	21.9	36.5% LOW NORMAL

Diagnosis: Normal Estrone level.
Clinical Support: No Intervention needed for Estrone.

We monitor Estrone (E1) because it represents the end product of one of two important pathways; 1) DHEA to Androstenedione to E1, and 2) DHEA to Testosterone then E2. Genetic variants and environmental toxins can block one or both of these pathways with an ultimate increase in the amount of DHEA/DHEAs as opposed to Free Testosterone. In many of our special operations combat forces we see a high DHEA/DHEAs level and low Free Testosterone level. This is due to blockage of the 3-beta and/or 17-beta dehydrogenase enzymes. This is a tell-tale sign of heavy metal (Hg & Pb) toxicity and/or environmental toxins. Less commonly, we see a greater amount E1(Estrone) as opposed to E2(Estradiol). According to the Framingham Heart Study this can cause an increased risk for Diabetes. The treatment for this is 7-Keto DHEA.
Note: An ideal range for E1 is Optimal.

Estradiol

Past Results

HIGH
Range: 112.5%

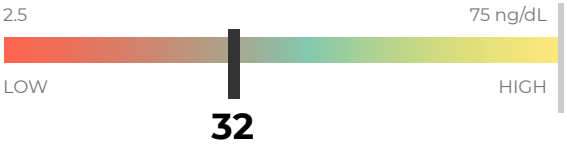
Date	Result	Range
11/22/2023	32	80% HIGH NORMAL
02/28/2024	33.45	83.6% HIGH NORMAL

Diagnosis: High Estradiol on Clomiphene Protocol.
Clinical Support: CONSIDER: Natural Aromatase Inhibitor: Zinc, EGCG.

Is the active metabolite from testosterone and is important in both females and males for increasing growth hormone, enhanced cerebral blood flow, protection of heart and bones, anti-Alzheimer's, and protects and regenerates neuroplasticity. In males, the use of an Aromatase Inhibitor (AI) to treat "excessive" estradiol due to abusive testosterone use is counterproductive when you consider all the systems that it poisons. It is wiser to lower the dose of testosterone than it is to use an AI. Chasing the Estradiol number is foolish, but countering it is intelligent.
Note: For both genders, an ideal range for E2 is Optimal with consideration for menstrual cycle levels in women.

Pregnenolone

Past Results



LOW NORMAL
Range: 40.7%

Date	Result	Range
11/22/2023	23.4	28.8% LOW NORMAL
02/28/2024	40	51.7% OPTIMAL

Diagnosis: Suboptimal Pregnenolone Level on P5 Protocol.
Clinical Support: INCREASE: Total Pregnenolone dosage to 100-150mg 15-30min after dinner.

Also known as the “Mother of all Hormones” it is the precursor to all other steroidal hormones being generated from cholesterol. Its production is regulated by Luteinizing hormone (LH) which is lost when Testosterone and Estradiol are used. Pregnenolone along with its active metabolites, Progesterone(P4) and Allopregnanolone (AlloP5), are neuroprotective, free radical scavengers, neuroregenerative, synaptogenic, and upregulates GABA production. It has also been shown to enhance production and release of acetylcholine (Ach) in the basolateral amygdala, cortex, and hippocampus. Central Ach is a neurotransmitter known to be involved in the regulation of memory processes and is affected in normal aging and severely altered in human neurodegenerative pathologies like Alzheimer’s disease.
Note: An ideal range for P5 is Optimal to High-normal.

Progesterone

Past Results

HIGH NORMAL
Range: 66%

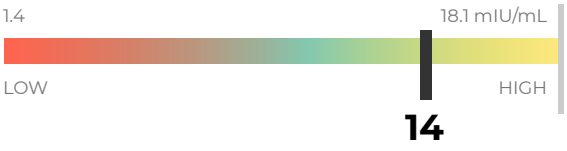
Date	Result	Range
11/22/2023	1.03	79.8% HIGH NORMAL
02/28/2024	0.98	74.5% HIGH NORMAL

Diagnosis: Acceptable Progesterone level.
Clinical Support: No Intervention for Progesterone.

P4 is derived from the metabolism of Pregnenolone and is the direct precursor to Allopregnanolone. Progesterone can down-regulate the production of 5-alpha reductase (5-AR), thereby decreasing the conversion of Free Testosterone to Dihydrotestosterone as well as Progesterone to Allopregnanolone. All three are neuroprotective, neuroregenerative, synaptogenic, free radical scavengers, and stimulate the production of GABA. In those with neuroinflammation the finding of P5/P4 insufficiencies is very common. Replenishment of P5 increases P4 and leads to improved sleep, cognition, and personality.
Note: An ideal range for P4 is Optimal to High-normal based upon medical conditions.

FSH

Past Results



HIGH NORMAL
Range: 75.4%

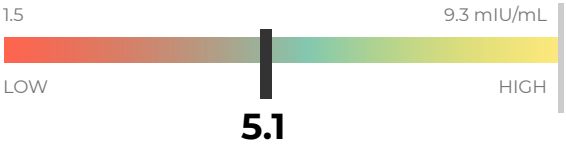
Date	Result	Range
11/22/2023	14	75.4% HIGH NORMAL
02/28/2024	5.63	25.3% LOW NORMAL

Diagnosis: Acceptable FSH Level on Clomiphene Protocol.
Clinical Support: No Intervention for FSH on Clomiphene Protocol.

FSH is the hormone produced by the pituitary gland to signal the gonads to produce eggs in women and sperm in men. Commonly when FSH is elevated above the normal range, it is associated with primary gonadal failure (MENopause or MANopause). Another cause for an elevated level of FSH is a benign pituitary tumor called a Gonadotrophic Adenoma. Appropriate HRT can possibly reduce this condition. FSH can be used in menopausal women to monitor the efficiency of hormonal replacement therapy (HRT). A significant drop in the level of FSH as well as LH will occur when the HRT is well absorbed and provides an adequate amount of the missing hormones.
Note: For both genders, an ideal range for E2 is Optimal with consideration for menstrual cycle levels in women.

Luteinizing Hormone

Past Results



OPTIMAL
Range: 46.2%

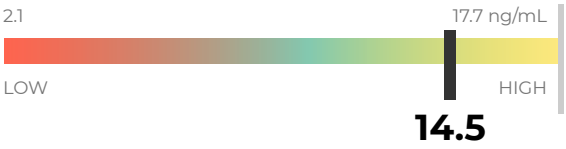
Date	Result	Range
11/22/2023	5.69	53.7% OPTIMAL
02/28/2024	7.22	73.3% HIGH NORMAL

Diagnosis: OPTIMAL Luteinizing Hormone Level on Clomiphene.
Clinical Support: No Intervention for LH on present Clomiphene Protocol.

This is the rate limiting hormone that initiates the production of all our steroidal hormones with the conversion of Cholesterol to Pregnenolone. It is also used to monitor hormone replacement therapy (HRT) where inadequate HRT will keep LH elevated while excessive HRT will reduce it towards zero. Medical articles acknowledge that persistent elevation of LH, especially in menopausal females, is associated with a higher risk for Alzheimer's Disease and cognitive impairment. This is also true in elderly males.
Note: For both genders, an ideal range for LH is Optimal with consideration for menstrual cycle levels in younger females who are women.

Prolactin

Past Results



NORMAL
Range: 79.5%

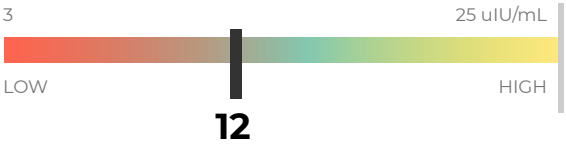
Date	Result	Range
11/22/2023	4.41	14.8% LOW NORMAL
02/28/2024	14.5	79.5% NORMAL

Diagnosis: Normal Prolactin level.
Clinical Support: No Intervention for Prolactin.

Prolactin is the hormone associated with lactation and when elevated causes a decrease in production of LH leading to decreased production of both Free Testosterone (fT) and Estrogens. Elevated Prolactin can also increase TSH production giving a false picture of hypothyroidism. Damage to different areas of the hypothalamus, that regulates pituitary production and release of Prolactin, can cause an increase or decrease in Prolactin production. Pregnancy, pituitary adenoma, hypothyroidism, and many medications can increase prolactin production and release thereby influencing testosterone, estradiol, and TSH production.
Note: An ideal range for Prolactin is within the Optimal.

Insulin

Past Results



NORMAL
Range: 40.9%

Date	Result	Range
11/22/2023	27.5	111.4% HIGH
02/28/2024	3.85	3.9% NORMAL

Diagnosis: Normal Insulin level.
Clinical Support: No Intervention for Insulin.

Insulin is an important marker of biochemical and pancreatic health. Insulin's function is to regulate blood glucose up-take by our cells and can be impaired when there is generalized inflammation, low chromium, low DHEA-s, low Testosterone, low zinc, and low Vitamin D3. This can lead to an elevation in measured fasting blood sugar and HgBA1c. Elevation in insulin with a normal or high glucose and HgBA1c could be representative of Insulin Resistant Type 2 Diabetes Mellitus (IRT2DM). Correcting the cause, most commonly low chromium can reverse the process.
Note: An ideal range for Insulin is within the range for morning fasting.

Vitamin D

Past Results

LOW
Range: -2.9%

Date	Result	Range
11/22/2023	33	4.3% LOW NORMAL
02/28/2024	78	68.6% NORMAL

Diagnosis: LOW Vitamin D3 on present VD3 Protocol. Verify compliance.
Clinical Support: Verify Vitamin D3 compliance and dosing of 125-250mcg, 15-30min after breakfast, 5-7 days a week.

Is a hormone derived from the very important cholesterol molecule. So, anything that interrupts cholesterol production can influence the homeostasis of not only Vitamin D3, but also all the hormones made in our brain. Vitamin D3 is an immune modulator that improves the quality and functioning of the immune system when it is activated. In conditions with elevation in cytokines (Covid-19, auto-immune diseases, decreased immunity, mood disorders, neurodegenerative conditions, diabetes, and heart disease), therapeutic levels of Vitamin D3 can help ameliorate the mounting inflammatory condition.
Note: An ideal range for Vitamin D is from Optimal to High-normal based upon any underlying medical conditions.

Zinc

Past Results

LOW
Range: -7.1%

Date	Result	Range
11/22/2023	98	54.3% OPTIMAL
02/28/2024	95	50% OPTIMAL

Diagnosis: LOW Zinc with High Estradiol.
Clinical Support: CONSIDER: Zinc citrate 30mg BID-TID, after meals.

Zinc is involved in over 300 enzymatic processes as well as having anti-viral (Covid-19, H1N1, Influenza, rhinovirus, and enterovirus), anti-cancer (P53), anti-Alzheimer's (SOD System and Neprilysin), and anti-diabetic properties. Elevated levels of Zn can diminish Copper (Cu) and Iron (Fe) stores which can be a cause for low energy, diminished immune functions, and anemia. Zinc can directly reduce the production of pro-inflammatory cytokines in the brain and enhance via the Zinc super-oxide dismutase (SOD) system which degrades damaging free radicals such as the Superoxide Radical (O2-).
Note: An ideal range for Zinc is Optimal, but for those with increased medical risks to High-normal.

TSH

Past Results

LOW NORMAL
Range: 13%

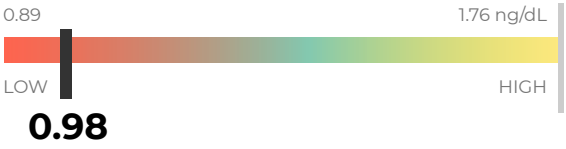
Date	Result	Range
11/22/2023	1.54	23.4% LOW NORMAL
02/28/2024	2.5	46.1% OPTIMAL

Diagnosis: Low-Normal TSH w/ Low-Normal T4. Central Dysfunction?
Clinical Support: CONSIDER: T4 50-100mcg/AM or T4/T3 combination 30-45mg, if symptomatic. Labs in 6-8 wks.

TSH is the hormone produced by the pituitary that stimulates the thyroid gland to make the hormones T4 and T3. The lack of TSH due to trauma and disease can lead to reduced production of these thyroid hormones creating the condition known as Hypothyroidism. This can also happen when there is an elevated level of TSH when the thyroid gland starts failing in the ability to produce T4. When Prolactin is elevated it can also raise the level of TSH confusing the cause for the pattern of hypothyroidism. Classical Hypothyroidism usually has an elevated TSH and diminished T4/T3 levels.
Note: An ideal range for TSH is Optimal.

T4, Free

Past Results



LOW NORMAL
Range: 10.3%

Date	Result	Range
11/22/2023	0.98	10.3% LOW NORMAL
02/28/2024	1.28	44.8% LOW NORMAL

Diagnosis: Suboptimal T4-Thyroid Hormone level. Central Dysfunction?
Clinical Support: See under TSH for T4 intervention.

T4 is the precursor to the active thyroid hormone, T3. Failure of the thyroid gland to produce T4 under normal circumstances will cause the pituitary to increase its production of TSH until a healthy level of T4 is achieved. The mineral selenium (Se) is very important to the thyroid's ability to make T4 as are iodine, calcium, zinc, and iron.
Note: An ideal range for T4 is Optimal.

TSHi

Past Results

CENTRAL
Range: -2.5%

Date	Result	Range
11/22/2023	1.67	13.2% CENTRAL
02/28/2024	2.67	48.9% NORMAL

Diagnosis: LOW TSH index associated w/ Central Thyroid Dysfunction from Neurotrauma.
Clinical Support: See comments under TSH, T4, and T3. HAP-Thyroid Dysfunction?

The TSH index is a mathematical model that shows the relationship between the level of pituitary TSH and the thyroid's production of T4. Physical, surgical, chemical, and radiation traumas damage the brain's regulation of TSH production. This will usually lead to a TSHi of less than 1.3, coinciding with Central Thyroid Dysfunction. When the TSHi is greater than 4.1 it is the Thyroid gland that is having problems like in primary thyroid dysfunction (hypothyroidism), Hashimoto's disease, Grave's disease, and under poor medical management of a known hypothyroid condition or Peripheral Thyroid Dysfunction. Central Thyroid Dysfunction, with a low TSHi, frequently does not need thyroid hormone replenishment. Improvement can sometimes occur with the use of an anti-inflammatory protocol. The Peripheral Thyroid Dysfunction, with high TSHi and TSH levels, frequently responds to thyroid hormone supplementation and the addition of minerals, vitamins, and the reduction of cortisol, if elevated.
Note: An ideal range for TSHi is Optimal.

T3, Free

Past Results

HIGH NORMAL
Range: 75.3%

Date	Result	Range
11/22/2023	3.31	53.2% OPTIMAL
02/28/2024	3.29	52.1% OPTIMAL

Diagnosis: Acceptable Total T3 (T3 & rT3) level w/ elevated rT3.
Clinical Support: No Intervention for Total fT3 level. Block rT3 production.

The precursor thyroid hormone T4 is converted in the circulation to activated T3. Failure to achieve ideal levels due to lack of production as in Hypothyroidism or the rapid conversion to inactive reverse T3, can cause the Low T3 Syndrome, affecting both the brain and generalized metabolism throughout the body.
Note: An ideal range for T3 is Optimal to High-normal based upon medical conditions.

rT3

Past Results

HIGH
Range: 158.8%

Date	Result	Range
11/22/2023	24	94.1% HIGH NORMAL
02/28/2024	12.3	25.3% OPTIMAL

Diagnosis: HIGH rT3 conversion from T4. Check minerals, B vitamins, Iron, Cortisol.
Clinical Support: See under TSH, T4 and T3. CONSIDER: Add Multivitamins w/ Trace Minerals (Se,Fe,I).

T4 is the primary precursor thyroid hormone produced in the thyroid gland by pituitary TSH. Once produced, T4 circulates and is slowly converted to activated T3 to modify metabolism, brain, and body growth. Under normal conditions T4 is converted to T3, but when there is deficiency of one of these: selenium, iron, B9, B12, Vitamin D, or Ferritin or an excess of cortisol, the inactive and damaging rT3 is preferentially produced. Additionally, inflammation of the thyroid gland as in Hashimoto's thyroiditis and Grave's disease is associated with elevation in rT3 too.
Note: An ideal range for RT3 is below the Normal range.

T3/rT3 ratio

Past Results

1.07

LOW
Range: 0.5%

Date	Result	Range
11/22/2023	1.38	16.5% LOW NORMAL
02/28/2024	2.67	83% NORMAL

Diagnosis: LOW T3/rT3 Ratio due to elevated rT3 = Low T3 Syndrome.
Clinical Support: LOW T3/rT3 Ratio due to elevated rT3 = Low T3 Syndrome.

This is the ratio of the active physiological T3 to the inactive and non-physiological reverse T3. This is important because of the benefits of T3 in the brain to support the reparative stem cells (Oligodendritic precursor stem cells). The literature states that a ratio of T3:rT3 that is less than 1.06 is representative of the Low T3 Syndrome due to excessive reverse T3. We have found in our large patient population that a T3/rT3 ratio of 2.0 appears to provide a better head space.
Note: The ideal range for the T3/rT3 ratio is Above 2.0 or Optimal.

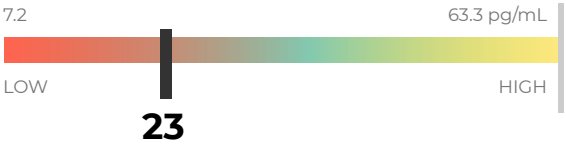
TPO

Diagnosis: High rT3 w/ Low Vitamin D is suggestive of Hashimoto's Thyroiditis.
Clinical Support: Get TPO and Anti-Thyroglobulin antibody testing. R/O Hashimoto's and Grave's diseases.

TPO is a marker for an auto-immune disease called Hashimoto's Thyroiditis (HT) which is associated with a high degree of disruptive inflammation in the thyroid gland. This can cause an exaggerated production of the inactive and receptor blocking reverse T3 (rT3). Additionally, almost all of our patients with HT have a concurrent Vitamin D deficiency or insufficiency.
Note: The ideal range for TPO is as close to zero as possible.

ACTH

Past Results



LOW NORMAL
Range: 28.2%

Date	Result	Range
05/16/2023	43	63.8% HIGH-NORMAL
11/22/2023	8.5	2.3% LOW NORMAL

Diagnosis: Normal ACTH to Cortisol Levels.
Clinical Support: No Intervention for ACTH. See under Cortisol.

ACTH is the hormone produced in the pituitary gland in response to environmental stressors like emotional stress, intellectual stress (education/work), physical stress (exercise), nutritional stress (starvation and fasting), and certain drugs, alcohol, and medication. ACTH goes to the Adrenal glands to turn on Cortisol which helps us to adapt to these stressors. Cortisol is an adaptogen with two pulses: the highest in the morning and a smaller one in the evening.
Note: The ideal range for ACTH for both diurnal pulses are in the Optimal range.

Cortisol

Past Results

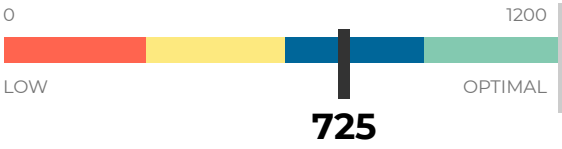
OPTIMAL
Range: 71.7%

Date	Result	Range
11/22/2023	17.5	71.1% OPTIMAL
02/28/2024	15.4	59% OPTIMAL

Diagnosis: Optimal Cortisol with normal ACTH.
Clinical Support: No Intervention for Cortisol.

Cortisol is the primary adaptogen produced by the adrenal glands under the stimulation of ACTH. As an adaptogen it supports our ability to deal with stress. When cortisol is low (Addison-like), fatigue, depression, irritability, low sex drive, and body aches are some of the common symptoms. When cortisol is high (Cushing-like), stress and anxiety, depression irritability, headaches, and increased heart rate (HRV) are some of the common symptoms. Generally speaking, since ACTH regulates cortisol production it will parallel the ups and downs of ACTH when the adrenal glands are functioning normally. Under chronic stress, the adrenal glands might not respond to stimulation by ACTH which is Adrenal Fatigue or Adrenal Shut Down.
Note: The ideal range for Cortisol for both diurnal pulses are in the Optimal range.

Neuroendocrine Efficiency Score



NORMAL
Range: 60.4%

The NeuroEndocrine Efficiency Score (NEES) is a quick reference of the overall hormonal status of the patient, based upon the Millennium's Biomarker panel. The NEES range is from zero to 1200, and is color coded based upon quartiles; 1st Quartile is Red, 2nd is Yellow, 3rd Blue, and 4th Green. Ideally, as the Treatment Protocol improves one's biochemistry, we expect to see a progressive improvement in the NEES. Improvement in this score normally correlates with the Monthly Program Questionnaire (MPQ) scores with improvement in psychological, physiological, and physical functioning.

Symptomatic Complaints

1. Migraine, NOS, Not intractable (G43.911)
2. Radiculopathy, Cervical Region (M54.12)
3. Depression NOS (F33.9)
4. Insomnia (due to alcohol abuse) (F10.182)

Medical History

- 2005: Adjustment Disorder w/ Depression (F43.21)
- 2003: Chronic Migraine without Aura, Not intractable (G43.701)
- 2003: Panic Attack (Episodic Paroxysmal Anxiety) (F41.0)
- 2002: Fatigue NOS (R53.83)
- 2002: Blast Wave Trauma (LOC) (Y36.20)
- 2001: History of Concussion/TBI/TIA NOS (Z87.820)

Current Medication

- 2023 - present: Clomiphene citrate (Clomid), 50mg Q72HRS AT BEDTIME
- 2023 - present: Somatropin (Norditropin), 1iu QAM
- 2003 - present: Bupropion (Wellbutrin), 50mg QAM

Additional Procedures

Brain Scan for pituitary adenoma.
Thyroid scan for Cold nodule.

Disclaimer: I, the undersigned, acknowledge that the Millennium-TBI Office Assistant is an educational tool to assist me in understanding the correlatable relationship between the hormones tested and their potential impact on patients with traumatic brain injury and/or age-related hormonal deficiencies. This program and its generated reports are not to used as the sole means of assessment and treatment of any patient. It is my responsibility to provide interpretation and treatment based upon my clinical acumen. The Millennium Health Centers, Inc., their associates, employees, program designer, and programmers cannot be held liable for my use of this information generated by this report. I assume full responsibility for any outcome of my breaching the intended application of this educational software program.

Mark Gordon MD		06/12/2024
Printed Name	**Signature**	**Date**