TEST REPORT

8605 SW Creekside Place
Beaverton, OR 97008
Phone: 503-466-2445 Fax: 503-466-1636

ZRT LABORATORY

 # 2023 12 12 039 SB

Ordering Provider:
Roots Wholistic Health

Samples Received
12/12/2023

Report Date
12/18/2023

Samples Collected
Saliva - 12/07/23 08:49
Saliva - 12/07/23 12:00
Saliva - 12/07/23 18:00
Saliva - 12/07/23 21:30
Blood Spot - 12/07/23 08:49
Blood Spot - 11/20/23 09:15

Patient Name: Hannah M Gagnon
Patient Phone Number: 920 639 2244

Gender	Last Menses	Height	Waist
Female	11/18/2023	5 ft 3 in	30 in
DOB	**Menses Status**	**Weight**	**BMI**
4/25/1988 (35 yrs)	Pre-Menopausal	135 lb	23.9

TEST NAME	RESULTS | 11/20/23	RANGE
Salivary Steroids		
Cortisol	5.9	3.7-9.5 ng/mL (morning)
Cortisol	1.8	1.2-3.0 ng/mL (noon)
Cortisol	1.5	0.6-1.9 ng/mL (evening)
Cortisol	0.6	0.4-1.0 ng/mL (night)
Blood Spot Steroids (LC-MS/MS) & Other Analytes		
Estradiol	395 H	51-302 pg/mL Premeno-luteal Adenomyosis
Progesterone	29.7 H	4.3-25.3 ng/mL Premeno-luteal
Ratio: Pg/E2	75 L	Pg/E2 (bloodspot-optimal 100-500)
Testosterone	47 H	18-39 ng/dL Premeno-luteal
SHBG	165 H	15-120 nmol/L binds to excess E+T
DHEAS	143	17-207 µg/dL
Blood Spot Thyroids		
Free T4	1.2	0.7-2.5 ng/dL
Free T3	3.7	2.4-4.2 pg/mL
TSH ?	4.2 H	0.5-3.0 µU/mL
TPOab	15	0-150 IU/mL (70-150 borderline)
Blood Spot		
Vitamin D, 25-OH, D2	<4	<4 if not supplementing (< 10 nmol/L)

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The above results and comments are for informational purposes only and are not to be construed as medical advice. Please consult your healthcare practitioner for diagnosis and treatment.

David T. Zava, Ph.D.
Laboratory Director

Alison McAllister, ND.
(Ordering Provider unless otherwise specified on page 1)

TEST NAME	RESULTS | 11/20/23	RANGE
Blood Spot		
Vitamin D, 25-OH, D3	42	20-80 ng/ml (50-200 nmol/L)
Vitamin D, 25-OH, Total	42 (80)	20-80 ng/ml (50-200 nmol/L)
LH	4.1	1.6-9.3 U/L Premenopausal-follicular
FSH	8.1	2.4-9.3 U/L Premenopausal-follicular

*<dl = Less than the detectable limit of the lab. **N/A** = Not applicable; 1 or more values used in this calculation is less than the detectable limit. **H** = High. **L** = Low.*

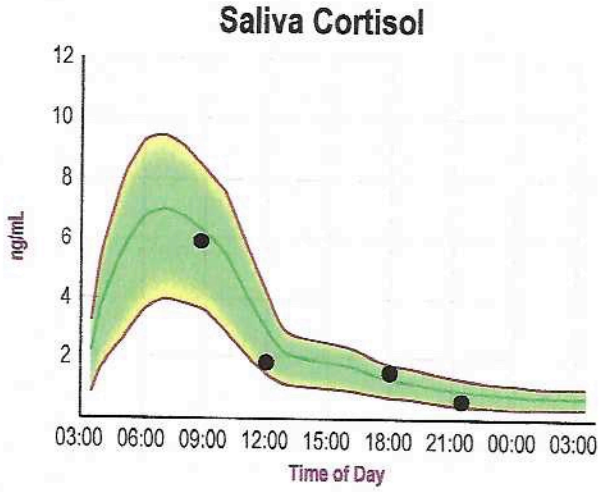
Therapies

2mg BID oral Estradiol (compounded) (8 Days Last Used); IM (SC) Injection hCG (Pharmaceutical) (6 Days Last Used)

Graphs

Disclaimer: Graphs below represent averages for healthy individuals not using hormones. Supplementation ranges may be higher. Please see supplementation ranges and lab comments if results are higher or lower than expected.

Average ▼▲ Off Graph



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Disclaimer: Supplement type and dosage are for informational purposes only and are not recommendations for treatment. For a complete listing of reference ranges, go to www.zrtlab.com/reference-ranges.

TEST NAME	WOMEN
Salivary Steroids	
Cortisol	3.7-9.5 ng/mL (morning); 1.2-3.0 ng/mL (noon); 0.6-1.9 ng/mL (evening); 0.4-1.0 ng/mL (night)
Blood Spot Steroids (LC-MS/MS) & Other Analytes	
Estradiol	<10-26 pg/mLPostmeno or Premeno + Synthetic E; 32-472 pg/mL topical, SL, troche, vaginal, patch ERT; 51-302 pg/mL Premeno-luteal; 30-92 pg/mL Early Follicular
Progesterone	<0.1-0.9 ng/mL Postmeno, Premeno-Follicular or Premeno + Syn P; 0.5-4.3 ng/mL Oral (100-300mg); 5.2-65.3 ng/mL Topical (10-30mg), SL, troche; 4.3-25.3 ng/mL Premeno-luteal
Ratio: Pg/E2	Pg/E2 (bloodspot-optimal 100-500)
Testosterone	13-38 ng/dL Postmeno or Premeno + Synthetic E; 29-224 ng/dL Pre/PostMenopausal TRT; 18-39 ng/dL Premeno-luteal
SHBG	15-120 nmol/L
DHEAS	17-207 µg/dL
Blood Spot Thyroids	
Free T4	0.7-2.5 ng/dL
Free T3	2.4-4.2 pg/mL
TSH	0.5-3.0 µU/mL
TPOab	0-150 IU/mL (70-150 borderline)
Blood Spot	
Vitamin D, 25-OH, D2	<4 if not supplementing (< 10 nmol/L)
Vitamin D, 25-OH, D3	20-80 ng/ml (50-200 nmol/L)
Vitamin D, 25-OH, Total	20-80 ng/ml (50-200 nmol/L)
LH	1.6-9.3 U/L Premenopausal-follicular; 1.0-12.8 U/L Premenopausal-luteal; 15.0-64.0 U/L Postmenopausal
FSH	2.4-9.3 U/L Premenopausal-follicular; 1.0-8.0 U/L Premenopausal-luteal; 31-134 U/L Postmenopausal

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TEST REPORT | Patient Reported Symptoms

Hannah M Gagnon
2023 12 12 039 SB

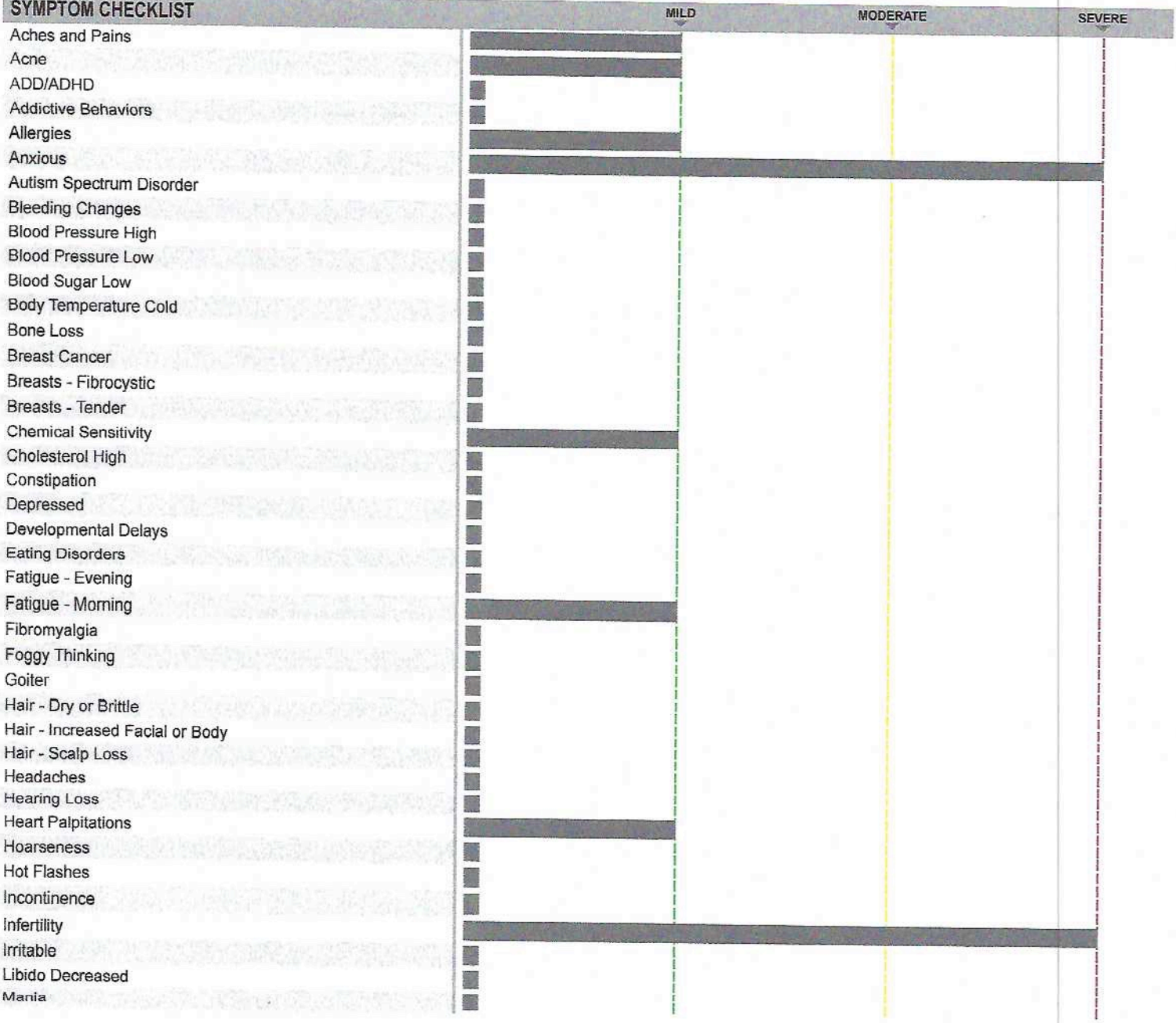
Disclaimer: Symptom Categories below show percent of symptoms self-reported by the patient compared to total available symptoms for each category. For detailed information on category breakdowns, go to www.zrtlab.com/patient-symptoms.

SYMPTOM CATEGORIES

RESULTS | 11/20/23

Estrogen / Progesterone Deficiency	20%
Estrogen Dominance / Progesterone Deficiency	7%
Low Androgens (DHEA/Testosterone)	8%
High Androgens (DHEA/Testosterone)	15%
Low Cortisol	23%
High Cortisol	29%
Hypometabolism	7%
Metabolic Syndrome	18%

SYMPTOM CHECKLIST



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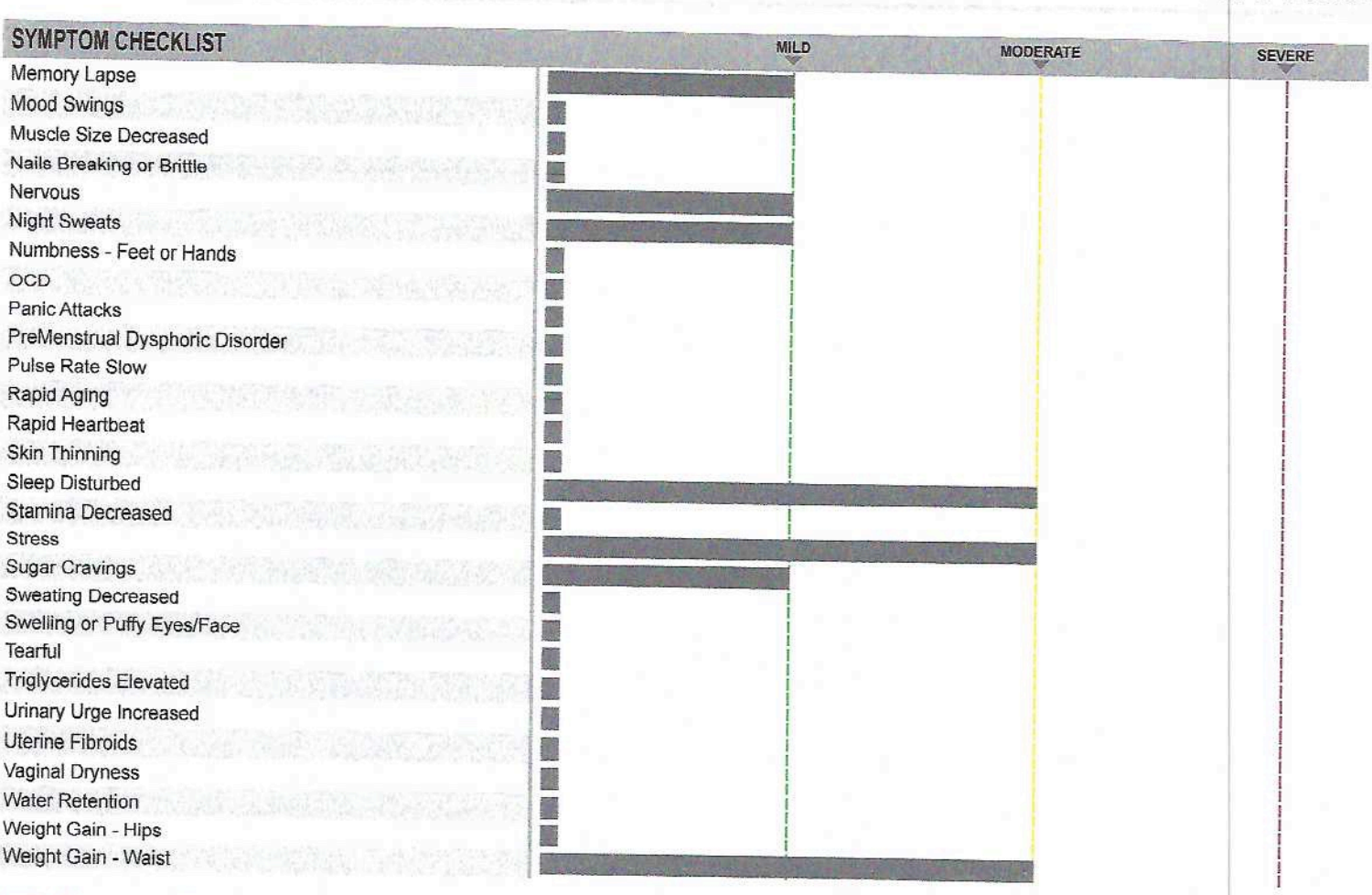

Lab Comments

Cortisol is near expected range throughout most of the day and is following a normal circadian rhythm; however, a significant number of symptoms commonly associated with adrenal stressors are self reported. Under stress situations the adrenal glands normally respond by increasing cortisol output. However, when cortisol levels are within normal range under situations of excessive stress, as reported herein, this suggests they may be overworking to keep up with the demands of the stressors, which could eventually lead to adrenal exhaustion. HPA axis dysfunction is most commonly caused by stressors which include: psychological stress (emotional), sleep deprivation, poor diet (low protein- particularly problematic in vegetarians), nutrient deficiencies (particularly low vitamins C and B5), physical insults (surgery, injury), diseases (cancer, diabetes), chemical exposure (environmental pollutants, excessive medications), low levels of cortisol precursors (pregnenolone and progesterone) and pathogenic infections (bacteria, viruses and fungi). A normal daily output of cortisol is essential to maintain normal metabolic activity, help regulate steady state glucose levels (important for brain function and energy production), and optimize immune function. Depletion of adrenal cortisol synthesis by a chronic stressor, sleep deprivation, and/or nutrient deficiencies (particularly vitamins C and B5) often leads to symptoms such as fatigue, allergies (immune dysfunction), chemical sensitivity, cold body temp, and sugar craving. For additional information about strategies for supporting adrenal health and reducing stress(ors), the following books are worth reading: "Adrenal Fatigue", by James L. Wilson, N.D., D.C., Ph.D.; "The Cortisol Connection", by Shawn Talbott, Ph.D.; "The End of Stress As We Know It" by Bruce McEwen; "Awakening Athena" by Kenna Stephenson, MD.

Estradiol (blood spot) is higher than the observed range for a premenopausal woman during mid-luteal phase of the menstrual cycle. Consider means to reduce the estrogen burden (e.g. exercise, more fiber in diet, nutritional and herbal supplements that help lower estrogens, natural progesterone). Estradiol should be reduced to optimal physiological level seen in healthy premenopausal women and then balanced with progesterone (ideal progesterone/estradiol ratio 100-500).

Progesterone (blood spot) is within expected upper-range for a premenopausal woman during mid-luteal phase of the menstrual cycle. Progesterone should be well balanced with estradiol (optimal Pg/E2 ratio 100-500, when estradiol is within mid-physiological range).

Testosterone (blood spot) is within high-normal range for a premenopausal woman. A slightly higher than range level of testosterone can be normal, particularly in younger women and elite athletes. High testosterone can also be associated with pathologiies such as Polycystic Ovarian Syndrome (PCOS) and in rare cases Congenital Adrenal Hyperplasia (CAH). PCOS is usually coassociated with high estrogens, high cortisol, and high insulin (insulin resistance/metabolic syndrome), whereas CAH is associated with high testosterone and very low cortisol. Testosterone

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may also derive from testosterone or androgen precursor (e.g. DHEA) therapies. If high androgen symptoms (e.g. loss of scalp hair, increased facial/body hair, acne, oily skin and hair, aggressiveness) are problematic consider the source of high T and treat accordingly. High levels of estradiol, progesterone, and cortisol inhibit testosterone synthesis (cortisol), bioavailability (estradiol induction of SHBG that sequesters T and DHT, preventing them from entering tissues from the bloodstream), and metabolism to its more potent metabolite DHT. Individuals with low thyroid or insulin resistance usually have lower SHBG and hence more bioavailable T.

SHBG (Sex Hormone Binding Globulin) is high, consistent with ORAL estrogen therapy. SHBG is a protein synthesized by the liver in response to estrogen exposure. All forms of estrogens (endogenous, hormonal contraceptives, phytoestrogens, and xenoestrogens) will increase liver production of SHBG. Liver exposure from oral estrogen therapy is higher with oral delivery, which likely accounts for the higher SHBG. SHBG binds tightly to testosterone and less tenaciously to estradiol, limiting their bioavailablity to target tissues. Because testosterone binds tighter to SHBG than does estradiol, an increase in SHBG results in proportionately less bioavailable testosterone. If testosterone is already low to low-normal, this can create a very low bioavailable level of testosterone and symptoms of androgen deficiency.

DHEAS (blood spot) is within range. DHEAS is highest during the late teens to early twenties and then declines progressively with age to the lower levels of the range in healthy men and women. Expect DHEAS to be in the high reference range until the mid-twenties, the mid-range during the thirties to early fifties and in the lower normal range thereafter. Low age-related DHEAS is often associated with low testosterone (DHEA is a testosterone precursor) and symptoms of androgen deficiency (fatigue, depression, low libido, loss of muscle mass, bone loss, memory lapses). Symptoms of androgen deficiency may be caused by low age-related DHEAS. Consider DHEA therapy if DHEA and/or testosterone are lower than age-expected levels.

Free T4 is within normal range and symptoms of thyroid deficiency are minimal.

Free T3 is within normal range and symptoms of thyroid deficiency are minimal.

TSH is high. Although most laboratories have a TSH range of 0.35-5.50, new studies are finding that the mean and median values are 1.0-1.5mU/l . TSH levels >3.0 are now considered abnormal due to changes by the endocrinology association - see www.aace.com for more information. Some experts believe that TSH should be kept below 2.0 for optimal health. Elevated TSH is often associated with symptoms of hypothyrodism, which include fatigue, decreased stamina, depression, rheumatic pain, sleep disturbances, cold extremities or feeling cold, reduced body temperature, brittle nails, dry coarse hair, hair loss, infertility, low libido, puffy eyes and face, decreased sweating, menorrhagia, and/or constipation. Periodic TSH monitoring is recommended if clinical symptoms of thyroid deficiency persist. T3 results may help guide treatment decisions. Thyroid therapy may be worthwhile considering if T4 and/or T3 are low and symptoms of thyroid deficiency are problematic.

Thyroid peroxidase (TPO) antibodies are low indicating that Hashimoto's autoimmune thyroiditis is unlikely.

LH and FSH are within range for a premenopausal woman.

Vitamin D is considered sufficient, but perhaps not optimal. Vitamin D deficiency has been closely associated with a wide range of conditions and diseases, which include cardiovascular disease, stroke, osteoporosis, osteomalacia, cancer, and autoimmune diseases such as multiple sclerosis, rheumatoid arthritis, and diabetes (types 1 and 2) (for review see: Holick MF. NEJM 357: 266-281, 2007). Lack of adequate sunlight resulting from geographical location (northern climates), excessive clothing, working indoors during daylight hours, purposely avoiding sunlight with clothing and sunscreens, and aging of the skin contribute to low vitamin D levels. Vitamin D3 may be increased by eating foods high in D3 (fish), exposing the skin to sunshine without sunscreen during mid-day for 15-20min (latitudes below Boston, MA), use of a UVB light, and/or supplementation with Vitamin D3.

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