



BIOCHEMISTRY

| URINE, 24 HOUR | Result | Range | Units |
|------------------------------|------------|-------|--------|
| CREATININE Urine Spot | 5.5 | | mmol/L |

ENDOCRINOLOGY URINE

| URINE, 24 HOUR | Result | Range | Units | |
|---|----------------|----------------|-----------|--|
| Urinary Adrenal Steroids | | | | |
| Total Volume | 2350 | 693 - 3741 | mL | |
| Creatinine, Urinary | 616 | | mg/L | |
| Creatinine, 24 Hour | 1448.5 | 600.0 - 2000.0 | mg/24hr | |
| Calcium, 24 Hour | 65.0 | 55.0 - 245 | ug/gCR | |
| Phosphorus, 24 Hour | 0.7 | 0.4 - 1.3 | g/24hr | |
| Magnesium, 24 Hour | 28.4 | 12.0 - 150.0 | ug/gCR | |
| Sodium, 24 Hour | 2187 | 350 - 3200 | ug/gCR | |
| Potassium, 24 Hour | 1139 | 780 - 3130 | ug/gCR | |
| 24 Hr THYROID EVALUATION. | | | | |
| T4, Urine | 7739 | 2465 - 13099 | pmol/24hr | |
| T3, Urine | 1895 | 1310 - 5312 | pmol/24hr | |
| T4/Creatinine | 5343 | 1785 - 9765 | pmol/gCR | |
| T3 / Creatinine | 1308 | 732 - 4750 | pmol/gCR | |
| T4/T3 Ratio | 4.1 | 0.5 - 10.0 | RATIO | |
| Cortisol, Urine | 140 *H | 25.0 - 120 | ug/24h | |
| Allo-Tetrahydrocortisol | 5.5 | 1.5 - 10.3 | umol/24h | |
| Tetrahydrocortisol | 12.2 | 3.9 - 13.1 | umol/24h | |
| Tetrahydrocortisone | 12.4 | 6.1 - 17.0 | umol/24h | |
| Tetrahydro-Deoxycortisol | 0.2 | 0.2 - 1.2 | umol/24h | |
| Total (OH) Corticosteroids | 30.3 *H | 8.8 - 22.4 | umol/24h | |
| Aldosterone | 21.7 | 6.0 - 44.0 | ug/24h | |
| Androsterone | 5.6 *H | 0.6 - 5.5 | umol/24h | |
| Etiocholanolone | 3.4 | 1.2 - 6.1 | umol/24h | |
| DHEA, Urine | 4.2 *H | 0.2 - 3.0 | umol/24h | |
| 11-OH- Androsterone | 5.3 *H | 1.3 - 4.8 | umol/24h | |
| 11-OH-Etiocholanolone | 1.4 | 0.5 - 2.6 | umol/24h | |
| 11-Ketoandrosterone | 1.7 | 0.3 - 1.9 | umol/24h | |
| 11-Ketoetiocholanone | 0.9 | 0.3 - 1.6 | umol/24h | |
| 17-Ketosteroids | 22.5 *H | 6.0 - 22.2 | umol/24h | |
| 17-Ketosteroids/Tot OHcorticoids | 0.74 *L | > 1.00 | RATIO | |
| Pregnanetriol (Pregnenolone) | 1.7 | 1.3 - 4.7 | umol/24h | |
| Testosterone, Urine | 2.0 | 0.6 - 2.2 | umol/24h | |

(*) Result outside normal reference range

(H) Result is above upper limit of reference rang (L) Result is below lower limit of reference range

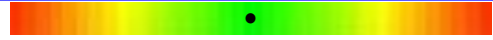


Date of Birth: 08-Jan-1985
Sex: M
Collected: 31/Oct/2019
Received: 31/Oct/2019
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Lab id: 3640442 UR#:

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Pregnanediol (Progesterone)

0.50 - 2.70 umol/24h



1.60

Pregnanediol Comment

Pregnanediol is the major metabolite of Progesterone in urine. It reflects the level of progesterone.

Progesterone is within range for a male.



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24 hr Urine Adrenals

Comment

ELEVATED CORTISOL LEVEL

Endocrine Effects: high-Hydrocortisone, thyroid, estrogens, progesterone, pregnenolone; low-melatonin.

Drug Effects: glucocorticoids.

Dietary Effects: High protein, high fat.

High levels are seen in Cushing's syndrome or with prolonged excessive exogenous glucocorticoid therapy.

Consider reducing therapy especially if total 17-Hydroxycorticoids are high.

An important note is that during adequate cortisol therapy, cortisol levels may be slightly higher than the reference range and this is acceptable if the 17-Hydroxycorticoids are within normal limits.

Other factors causing high urinary cortisol levels are excess stress, prolonged exercise bouts and melatonin deficiency.

In women, pregnancy can elevate urinary cortisol levels. Estrogen may normalize cortisol levels.

Excess levels of thyroid hormones increase the release of ACTH and therefore increase cortisol.

ALLOTETRAHYDROCORTISOL (a-THF) LEVEL HIGH:

Excess production and/or metabolism of cortisol leads to high urinary levels of the peripheral metabolite, allo-tetrahydrocortisol (a-THF). Low levels of thyroid hormones increase the metabolism of cortisol.

(THE) Tetrahydrocortisone.

Excess cortisol will result in high levels of urinary THE and are usually from exogenous sources (confirm with urinary cortisol).

If there is excess cortisol to cortisone conversion or excess metabolization of cortisone, urinary levels of THE will be high.

Consider lowering cortisol dose.

THS - LOW

levels are low with cortisol deficiency (verify with urinary cortisol).

Two enzyme deficiencies or blocks also can cause low THS levels and they are 21-hydroxylase or 17-alpha-hydroxylase.

It may also be due to a progesterone deficiency (confirm with urinary pregnanediol).

ELEVATED 17-HYDROXYCORTICOIDS:

Elevated 17-Hydroxycorticoid levels are attributable to excess cortisol levels and prolonged periods of excessive stress. Adrenal androgen deficiency causes high levels (confirm with urinary DHEA levels).

Excess levels of thyroid hormones also lead to high levels of 17-Hydroxycorticoids. It is important to rule out Cushing's disease & syndrome and pituitary & adrenal tumors. Elevated 17-Hydroxycorticoid levels may be an indicator of Adrenal Catabolic Syndrome when there are also low levels of urinary 17-Ketosteroids.

A diet high in protein, high in fat and excess calories can also elevate 17-Hydroxycorticoids.

17-KETOSTEROIDS ELEVATED .

Elevated levels (Androsterone and Etiocholanolone) are found in instances of excess



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DHEA especially if 11- hydroxyandrosterone and 11-ketoetiocholanolone are also found to be high.



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Elevated levels of testosterone can also contribute if there are also high levels of androsterone and etiocholanolone.
 Excess levels of dihydrotestosterone (DHT) may raise levels especially if testosterone is high. Consider lowering doses of androgen therapy.
 Excessive growth hormone administration also adds to high levels of total 17-Ketosteroids. High protein and high calorie diets also result in elevated total 17-Ketosteroids.
 Rule out pregnancy, adrenal tumors, pituitary dysfunction, Cushing's disease, hirsutism (with low to normal 17-Hydroxycorticoids) and hypertension.

17-keto/11-OHCorticoid Ratio <1

Excess levels of glucocorticoids are referred to as Adrenal Catabolic Syndrome, which is indicative of too much "wear and tear" and not enough "rest and repair". Use of adrenal androgen therapy or reducing cortisol therapy should be considered. Other contributing factors to a sub-optimal ratio are excess levels of stress and/or exercise and a lack of rest and recovery.

24 hr Urine Androgens Comment

ELEVATED ANDROSTERONE LEVEL:

Elevated androsterone levels are found with excess testosterone therapy especially if etiocholanolone and total 17-Ketosteroids are high.
 Excess androstenedione dosing can elevate especially if there is high levels of etiocholanolone and total 17-Ketosteroids.
 DHEA excess can lead to high levels of urinary androsterone especially if there are high levels of etiocholanolone, 11-hydroxyandrosterone, 11- ketoetiocholanolone and total 17-Ketosteroids.

ELEVATED URINE DHEA LEVEL:

Elevated DHEA levels are usually due to excess supplementation especially if there are high levels of total 17-Ketosteroids, 11-OHandrosterone and 11-ketoetiocholanolone. Consider reducing DHEA dose. Elevated levels may also be due to a deficiency of or a block of 3-beta-hydroxysteroid dehydrogenase enzymes.

ELEVATED 11-OH ANDROSTERONE LEVEL:

Elevated levels are associated with/contributed by elevated urine DHEA levels. Androstenedione is the next most significant hormone and an excess of androstenedione will elevate results.
 Cortisol is a minor contributor; an excess of cortisol can elevate results. Confirm with other hormone values.

Urinary Estrogens

| | | | | |
|-------------------------|-------------|-------------|--------|--|
| Estradiol, Urine | 4.8 | 0.8 - 5.0 | ug/24h | |
| Estrone, Urine | 13.2 | 2.0 - 16.0 | ug/24h | |
| Estriol, Urine | 11.2 | 9.0 - 19.0 | ug/24h | |
| Melatonin, Urine | 18.1 | 12.3 - 32.8 | nmol/L | |

Melatonin Comment

MELATONIN COMMENT:

24hour Urine Melatonin levels are dependent on patients' age. Additionally, supplementing with steroids such as estrogens, androgens, adrenal hormones, tryptophan and 5HTP can also impact on the hormone levels, as can lifestyle choices and dietary choices. e.g. smoking, caffeine, and carbohydrates and shift work.

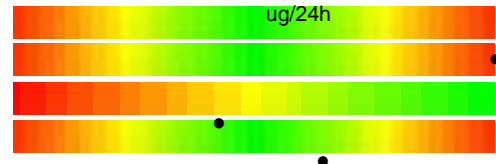
| | | | | |
|---|------------|------------|-----------|--|
| Growth Hormone, Urine | 341 | 220 - 1259 | pg/100mgC | |
| Estrogen Metabolites, 24hr Urine | | | | |



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| Metabolite | 2-OH E1 (Protective) | Reference Range | Unit |
|---|----------------------|-----------------|--------|
| Metabolite | 5.60 | 2.20 - 10.90 | ug/24h |
| 16-OH E1 (Proliferative Metabolite) | 2.80 *H | 1.50 - 1.90 | |
| 2/16-OH E1 Ratio (Anti-Prolif'tive Index) | 2.00 *L | > 2.00 | RATIO |
| 4-OH E1 (Mutagenic Metabolite) | 2.61 | 2.30 - 2.71 | ug/24h |



Estrone Metabolites Comments

URINE 2OH-E1 METABOLITE COMMENT:

These estrogens have been named "good estrogen" and by some authors are thought to be cancer protective estrogens. Their role and impact in males has not been adequately researched or published. Most of the research has been done relative to women's breast cancer.

URINE 16a(OH)-E1 METABOLITES:

High/Elevated levels of 16aOH-E1 have been associated with an increase risk in breast cancer. 16aOH-E1 is the immediate precursor to the weak estrogen, estriol (E3). Lowering levels of 16aOH-E1 have been achieved via indole-3-carbinol or one of its metabolites, di-indol methane (DIM). Soy and flax meal have also been shown to lower 16aOH-E1 levels.

Please also note that 16aOH-E1 is important for maintaining bone mineral density.

2(OH):16a(OH)-E1 METABOLITE RATIO

Target Range:

Ratio > 2.0 Beneficial

Ratio < 2.0 Increased risk of Breast Cancer

Literature indicates that a ratio less than 2.0 may increase the risk of breast cancer in women. There is no published evidence that this applies to males.

Patients with a ratio less than 2.0 may benefit from a modification in diet and lifestyle.

The supplementation of the diet with phytoestrogens may further improve the ratio. A high protein, low fat diet rich in dietary sources of indole-3-carbinol may also improve the 2/16 ratio. Diindolylmethane (DIM) has also been shown to improve the 2/16 ratio.

URINE 4OH-E1 COMMENT:

Along with 2OH-E1, 4OH-E1 comprises what are called the catechol estrogens. However, unlike 2OH-E1, this estrone has been shown to be a free radical generator and a very powerful estrogen.

Elevated levels occur in the urine following severe exercise and may indicate a relative lack of the enzyme, catecholamine methyl transferase.

Increasing dietary folic acid may help rectify this situation.

USEFUL NOTES:

Protective Metabolites: 2-OH E2, 2-OH E1, 2-Methoxy E1.

Anti-Proliferative Metabolites: 2-Methoxy E2.

Carcinogen and Active Estrogen Metabolites: 16 alpha OH E1, 4-OH E1.

Active Estrogens: E2, E1, E3.

The use of DIM/Indole-3-Carbinol supplementation is to shift estrogen metabolism to increase levels of 2 OH and 2 Methoxy metabolites:

E1 conversion to 2-OH E1 and 2-methoxy E1.

E2 conversion to 2-OH E2 and 2-methoxy E2.

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Supplementary IM Comments

Creatinine level is within normal range.

T4 is within range.

T3 is low normal but can be further improved if indicated. Check for and supplement with selenium if indicated. Selenium is the major co-factor required for peripheral conversion of T4 to T3. If T4 is also low suspect a deficiency in Tyrosine and or Iodine. Also check for excess cortisol as it can lower conversion of T4 to T3 whilst increasing reverse T3. Consider supplementation with combination T4/T3 starting at 15mg daily and titrate by increasing dose by 15mg every 10 days until serum TSH<2.0 and patient symptoms have improved.

ELEVATED CORTISOL LEVEL:

The Cortisol is elevated, and is suggestive of adrenal stress. Consider supplementing with phosphatidyl serine to lower cortisol. Supplement with Melatonin to lower nocturnal cortisol levels. Chronically elevated cortisol can cause a decrease in catecholamines and decrease the neuroendocrine hormones dopamine, noradrenaline and adrenaline. If mood disorders are noted, consider checking urine neurotransmitter metabolites.

ELEVATED URINE DHEA LEVEL:

Elevated urine DHEA is usually due to excess supplementation. Consider reducing dose if there are high levels of total 17-Ketosteroids, 11-hydroxyandrosterone and 11-ketoetiocholanolone.

Testosterone is within range.

ESTRADIOL (E2) COMMENT:

E2 is within range and not suggestive of aromatization. Recommend also checking E1 level if BMI>30.

E1 is within range for a male.

ESTRIOL (E3) COMMENT:

E3 is within range for a male. Measuring E2 and E1 are more meaningful in a male.