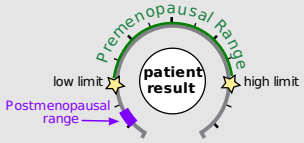
PATIENT:	**Sample Report**			TEST REF:	**TST-##-#####**
TEST NUMBER:	##########	COLLECTED:	dd/mm/yyyy		
PATIENT NUMBER:	##########	RECEIVED:	dd/mm/yyyy	PRACTITIONER:	**Nordic Laboratories**
GENDER:	Female	TESTED:	dd/mm/yyyy	ADDRESS:	
AGE:	35				
DATE OF BIRTH:	dd-mm-yyyy				

TEST NAME: DUTCH Complete Female Sample Report

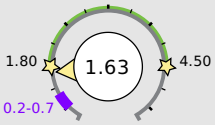
Hormone Testing Summary

Key (how to read the results):

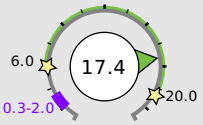


Sex Hormones

See Pages 2 and 3 for a thorough breakdown of sex hormone metabolites



Estradiol(E2)



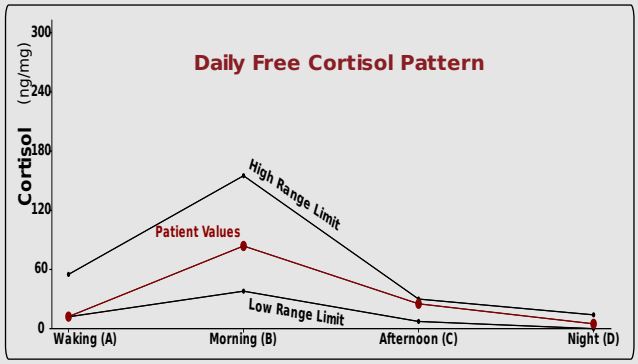
Progesterone
(Serum Equivalent, ng/mL)

Progesterone Serum Equivalent is a calculated value based on urine pregnanediol.

Testosterone

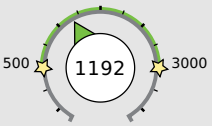
Adrenal Hormones

See pages 4 and 5 for a more complete breakdown of adrenal hormones

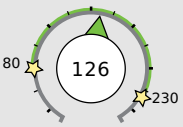


Total DHEA Production

Age	Range
20-39	1300-3000
40-60	750-2000
>60	500-1200

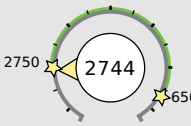


Total DHEA Production
(DHEAS + Etiocholanolone + Androsterone)



24hr Free Cortisol
(A+B+C+D)

cortisol metabolism



Metabolized Cortisol (THF+THE)
(Total Cortisol Production)

Free cortisol best reflects tissue levels. Metabolized cortisol best reflects total cortisol production.

The following videos (which can also be found on the website under the listed names along with others) may aid your understanding:
DUTCH Complete Overview Estrogen Tutorial Female Androgen Tutorial Cortisol Tutorial

PLEASE BE SURE TO READ BELOW FOR ANY SPECIFIC LAB COMMENTS. More detailed comments can be found on page 8.

- The patient shows significantly higher free cortisol compared to metabolized cortisol. It may be advisable to check thyroid hormones if you have not. See comments in the notes for more details.

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Nordic Laboratories dutch

PATIENT:	**Sample Report**			TEST REF:	**TST-##-#####**
TEST NUMBER:	##########	COLLECTED:	dd/mm/yyyy	PRACTITIONER:	**Nordic Laboratories**
PATIENT NUMBER:	##########	RECEIVED:	dd/mm/yyyy	ADDRESS:	
GENDER:	Female	TESTED:	dd/mm/yyyy		
AGE:	35				
DATE OF BIRTH:	dd-mm-yyyy				

TEST NAME: DUTCH Complete Female Sample Report

Category	Test		Result	Units	Normal Range
Creatinine (Urine)					
	Creatinine A (Waking)	Within range	0.82	mg/ml	0.2 - 2
	Creatinine B (Morning)	Within range	1.14	mg/ml	0.2 - 2
	Creatinine C (Afternoon)	Within range	0.35	mg/ml	0.2 - 2
	Creatinine D (Night)	Within range	0.46	mg/ml	0.2 - 2
Daily Free Cortisol and Cortisone (Urine)					
	Cortisol A (Waking)	Low end of range	12.2	ng/mg	12 - 55
	Cortisol B (Morning)	Within range	83.8	ng/mg	38 - 155
	Cortisol C (Afternoon)	Within range	25.2	ng/mg	7.3 - 30
	Cortisol D (Night)	Within range	4.9	ng/mg	0 - 14
	Cortisone A (Waking)	Within range	56.0	ng/mg	40 - 120
	Cortisone B (Morning)	Above range	254.6	ng/mg	90 - 230
	Cortisone C (Afternoon)	Above range	116.8	ng/mg	32 - 95
	Cortisone D (Night)	Within range	30.0	ng/mg	0 - 55
	24hr Free Cortisol	Within range	126.1	ng/mg	80 - 230
	24hr Free Cortisone	Above range	457.5	ng/mg	220 - 450
Cortisol Metabolites and DHEA-S (Urine)					
	a-Tetrahydrocortisol (a-THF)	Within range	139.0	ng/mg	75 - 370
	b-Tetrahydrocortisol (b-THF)	Below range	1035.0	ng/mg	1050 - 2500
	b-Tetrahydrocortisone (b-THE)	Low end of range	1570.0	ng/mg	1550 - 3800
	Metabolized Cortisol (THF+THE)	Below range	2744.0	ng/mg	2750 - 6500
	DHEA-S	Low end of range	55.0	ng/mg	20 - 750

Nordic Laboratories dutch

PATIENT:	**Sample Report**			TEST REF:	**TST-##-#####**
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PATIENT NUMBER:	##########	RECEIVED:	dd/mm/yyyy	ADDRESS:	
GENDER:	Female	TESTED:	dd/mm/yyyy		
AGE:	35				
DATE OF BIRTH:	dd-mm-yyyy				

TEST NAME: DUTCH Complete Female Sample Report

Category	Test		Result	Units	Normal Range
Nutritional Organic Acids					
Vitamin B12 Marker (may be deficient if high) - (Urine)					
	Methylmalonate (MMA)	Within range	1.0	ug/mg	0 - 2.2
Vitamin B6 Markers (may be deficient if high) - (Urine)					
	Xanthurenate	Within range	0.5	ug/mg	0 - 1.4
	Kynurenate	Within range	2.6	ug/mg	0 - 7.3
Glutathione Marker (may be deficient if low or high) - (Urine)					
	Pyroglutamate	Within range	52.4	ug/mg	32 - 60
Neurotransmitter Metabolites					
Dopamine Metabolite - (Urine)					
	Homovanillate (HVA)	Within range	6.6	ug/mg	4 - 13
Norepinephrine/Epinephrine Metabolite - (Urine)					
	Vanilmandelate (VMA)	Within range	5.1	ug/mg	2.4 - 6.4
Melatonin (*measured as 6-OH-Melatonin-Sulfate) - (Urine)					
	Melatonin* (Waking)	Within range	31.3	ng/mg	10 - 85
Oxidative Stress / DNA Damage, measured as 8-Hydroxy-2-deoxyguanosine (8-OHdG) - (Urine)					
	8-OHdG (Waking)	Within range	2.6	ng/mg	0 - 5.2

PATIENT:	**Sample Report**			TEST REF:	**TST-##-#####**
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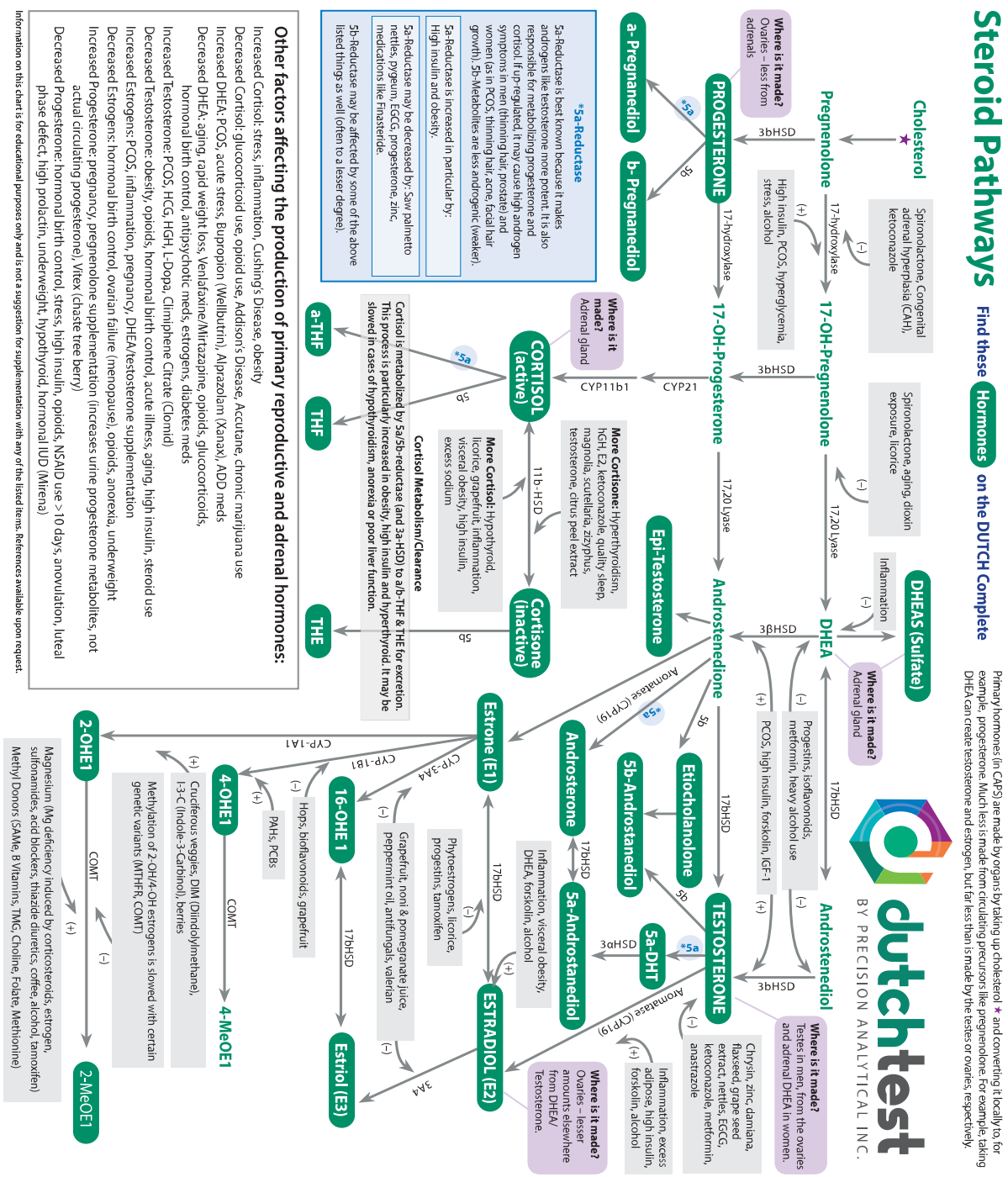
TEST NAME: DUTCH Complete Female Sample Report



TEST NAME: DUTCH Complete Female Sample Report

UoDop

polDpNSoop

SR SR :: R HMR:RSSMM:SSS M: M:rS SR
::RM:Sr RRMRRS R R Sr SNrR r S S::rrR
:NrRr Sr SN S S:S:: M::rSr S
NR: SMR:S :S::: NR: M RR SRRSrSRM
H: F:: SR::SRr:rSRNMRS::

RrR:M RRSH rN:S S R : M:rS SN: S S M :rrS
MRRS RSrRRFMMrR

rMSR MrSHRrrS FS rSRSRRSHRrrS RR NrM
N TTN NRrS SrrS r RR:rRRSHRrrSR RS
NrMN MR SRr:MR SR NRr S S:SSrrRR RRRRSR
M:RRMrMRN R NRr SRRSR NRr Srr:
Sr ::rSSR RN NRr S S:SMRMrrr
R r :Srr R RS Rr

UlppolCp

RR R:MR SRASRMR SSMM RRS RRSr S SMR Srr
NR: SSM RR R SM RSR R SR SM RS SMM RRMS
rrN CD

NlppoopoAHClopoHlC C:

UoApomplC

RrRRS RS RNrM S RM SRS RRS R NRr S S::
M RS RrrSrrNMSr rRS RSR:HSRNF:RrS MrrS:S
SR NMS S RS N: NRr HN rSR S MRSR:F:Rr
R R NRr SSR :RRS RrrS rR R MMR:
RS RrrSHS RSR RRMS RRMM
E: Rr HRrrS RS R r R S U
NRr SRRS RNR:RMRr S RrR RS RS R RR: Sr
MRr RS S RS RrS RSrr r NRr SM SSr
SR Sr Sr S RS RSr R S SR RS RSr
r SSr r MrS StDRS RS RrrrSR SNrrH
S NRr S r::R NRrS:Sr S:RtDMM rM S rrS

UoApooHCploolAol CAlpNCHplCNlDlpAHClpCC HooD
Dl opNlCCCplCHlpNlCpN oApoCClo IClpNpoA
ICC CIC plolloppNpHo:

poAmplC

rES RrrSH SR RSSSS RrrR
• NplpHColCoNANpoAoDHp:
ArSR R:R:M HS :Rr S RS S RHS rrSM rS RSMMRS::
RRR RHMRS: R RSrRRS RSr

• UNlmplC:
S RS NRr:rN r:R S S CFDSMRS:: SS

because of the anti-cancer properties of 2-OH metabolites. Conversely, the 4-OH pathway is considered the most genotoxic as its metabolites can create reactive products that damage DNA. The third pathway, 16-OH creates the most estrogenic of the metabolites (although still considerably less estrogenic than estradiol) - 16-OH-E1. If overall estrogen levels are high, production of 16-OH-E1 may exacerbate high estrogen symptoms. Similarly, a woman with very low levels of estrogens, may have less low estrogen symptoms if 16-OH metabolism is preferred. For example Armamento-Villareal showed that a higher 2-OH-E1/16-OH-E1 ratio correlated to bone loss (a low estrogen symptom). Estriol is thought of as a safer (weaker) estrogen metabolite, but it is important to remember that estriol is actually 16-OH-E2, so generally patients that make a lot of the potentially protective/weak estriol may also make a lot of the estrogenic 16-OH-E1.
When evaluating phase I metabolism, it may be important to look at the ratios of the three metabolites to see which pathways are preferred relative to one another. It may also be important to compare these metabolites to the levels of the parent hormones (E1, E2). If the ratios of the three metabolites are favorable but overall levels of metabolites are much lower than E1 and E2, this may imply sluggish phase I clearance of estrogens, which can contribute to high levels of E1 and E2. Similarly, patients with excessive phase I metabolism may have low E1 and E2 levels because of high rates of clearance (as opposed to simply not making a lot of estrogen).
The pie chart will assist you in comparing the three pathway options of phase I metabolism compared to what is "normal." 2-OH metabolism can be increased by using products containing D.I.M. or I-3-C. These compounds are found (or created from) in cruciferous vegetables and are known for promoting this pathway.

Patients typically metabolize a much higher percentage of their estrogens down the more protective 2-OH pathway in phase 1 detoxification. Diindolylmethane (DIM) or Indole-3-Carbinol containing products can help move estrogens more efficiently down this pathway. Be aware that this typically lowers most of the other estrogens, including E1 and E2 as well. If the patients are taking or considering hormone replacement therapy, these products may be considered but a higher dose of estrogen may be needed for the same clinical effect if taken at the same time.

- **Methylation (part of phase II metabolism) of estrogens:**

After phase I metabolism, both 4-OH and 2-OH (not 16-OH) estrogens can be deactivated and eliminated by methylation. The methylation-activity index shows the patient's ratio of 2-Methoxy-E1 / 2-OH-E1 compared to what is expected. Low methylation can be caused by low levels of nutrients needed for methylation and/or genetic abnormalities (COMT, MTHFR). The COMT enzyme responsible for methylation requires magnesium and methyl donors. Deficiencies in folate or vitamin B6 or B12 can cause low levels of methyl donors. MTHFR genetic defects can make it more difficult for patients to make sufficient methyl donors. Genetic defects in COMT can make methylation poor even in the presence of adequate methyl donors.

Androgen Metabolism

When evaluating androgen levels, it is important to assess the following:

- **The status (low, normal or high?) of DHEA:**

DHEA and androstenedione are made almost exclusively by the adrenal gland (although a smaller amount is made in the ovaries). These hormones appear in urine as DHEA-S (DHEA-Sulfate), androsterone and etiocholanolone. The best way to assess the total production of DHEA is to add up these three metabolites. This total can be seen on the first page of the DUTCH Complete (and DUTCH Plus). DHEA production decreases quite significantly with age. Age-dependent ranges can be seen on the graphical page of results.

The Total DHEA Production (page 1) was about 1,192ng/mg which is within the overall range but is below the range for the patient's age-dependent range. This implies that the adrenal glands are not producing appropriate DHEA levels for the patient's age. Low DHEA is associated with depression, diabetes, heart disease, inflammation and immune disorders. It can be caused by hypothyroidism. It can cause fatigue, low mood and low libido. Supplementing DHEA in women often raises both testosterone and estrogen, which may or may not be desirable here. DHEA may increase with adaptogens such as maca and rhodiola, which improve overall adrenal output.

- **The status (low, normal or high?) of testosterone:**

Females make most of their DHEA in the adrenal gland and a fraction of that DHEA trickles down metabolically to testosterone. For premenopausal women, some testosterone is also made by the ovaries. Levels of testosterone do drop somewhat with age, but not to the degree that DHEA decreases.

Testosterone levels for this patient were approximately 2.60ng/mg, which is within range, but is below "normal" levels for a young, healthy woman. You may want to also carefully evaluate 5a-metabolism (see below) and testosterone's downstream metabolites, 5a-androstanediol and 5b-androstanediol on page 2 of the DUTCH Plus or DUTCH Complete. They are on page 1 of a DUTCH Sex Hormone. These two metabolites generally parallel testosterone production, although they can also be generated from DHEA without going through testosterone. If all markers are on the lower end of the range and she reports low androgen symptoms (fatigue, loss of libido, bone loss, etc.), you may want to consider testosterone HRT or symptomatic support with Zinc, Maca, Tribulus or Shatavari.

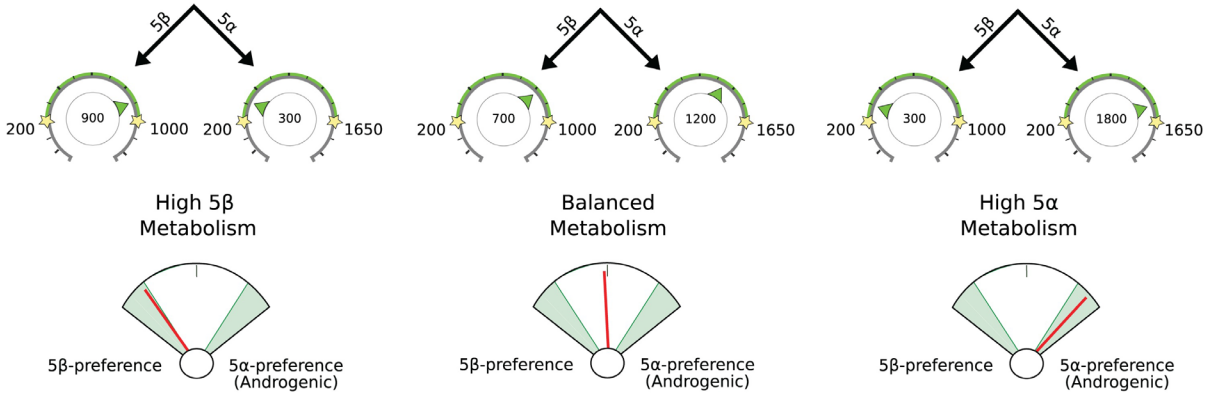
- **The metabolic preference for the 5a (5-alpha) or 5b (5-beta) pathway:**

5a-reductase converts testosterone into 5a-DHT (DHT), which is even more potent (~3x) than testosterone. High levels of DHT can lead to symptoms associated with too much testosterone. Metabolites created down the 5b-pathway are significantly less androgenic than their 5a counterparts. In the examples below, the example on the left shows a patient with 5b-metabolism preference. A patient with a pattern like the example on the right may have high androgen symptoms even though the hormones are in the normal range because of the likely preference for turning a lot of her testosterone into DHT. The fan-style gauge below the hormones shows the 5a or 5b preference based on etiocholanolone (5b) and androsterone

TEST NAME: DUTCH Complete Female Sample Report

(5a) resu ts Progesterone metabo tes are a so metabo zed by 5a and 5b enzymes and the ba ance between ts two metabo tes can be usefu to confirm a 5a or 5b preference

Example of how to read fan-style gauge for 5a-reductase activity:



Neither testosterone or overall levels of DHEA are elevated, and 5a-metabolism is not elevated. This is consistent with the patient's lack of reporting androgen excess symptoms.

t s mportant to cons der DHEA and testosterone product on, 5a metabo sm patterns as we as the pat ent symptoms For examp e, a woman w th h gher eve s of DHEA and testosterone w often have h gh androgen symptoms (fac a ha r, th nn ng sca p ha r, etc) exacerbated by 5a metabo sm f, on the other hand, she prefers 5b metabo sm she may not express h gh androgen symptoms n sp te of h gher eve s of testosterone because 5b s the ess androgen c pathway Testosterone eve s may be better understood by a so cons der ng ts downstream metabo tes (5a androstaned o , 5b androstaned o) Techn ca y, these metabo tes can a so be formed from DHEA metabo tes w thout go ng through the testosterone pathway, but they genera y tend to corre ate w th testosterone product on
You w a so see eve s of ep testosterone, wh ch s not androgen c ke testosterone t happens to be produced n about the same concentrat ons as testosterone (th s s an approx mate re at onsh p) Th s can be he pfu to assess testosterone therapy and rare cases where testosterone may have other comp ex t es

DUTCH Adrenal

The HPA Ax s refers to the commun cat on and nteract on between the hypotha amus (H) and p tu tary (P) n the bra n down to the adrena g ands (A) that s t on top of your k dneys When a phys ca or psycho og ca stressor occurs, the hypotha amus te s the p tu tary to make ACTH, a hormone ACTH st mu ates the adrena g ands to make the stress hormone, cort so and to a esser extent DHEA and DHEA S Norma y, the HPA ax s product on fo ows a da y pattern n wh ch cort so r ses rather rap d y n the first 10 30 m nutes after wak ng n order to he p w th energy, then gradua y decreases throughout the day so that t s ow at n ght for s eep The cyc e starts over the next morn ng Abnorma y h gh act v ty occurs n Cush ng's D sease where the HPA ax s s hyper st mu ated caus ng cort so to be e evated a day The oppos te s known as Add son's D sease, where cort so s abnorma y ow because t s not made appropr ate y n response to ACTH's st mu at on These two cond t ons are somewhat rare Examp es of more common cond t ons re ated to ess severe y abnorma cort so eve s nc ude fat gue, depress on, nsomn a, fibromya g a, anx ety, nflammat on and more

On y a fract on of cort so s "free" and b oact ve Th s fract on of cort so s very mportant, but eve s of metabo zed cort so best represent overa product on of cort so therefore both shou d be taken nto account to correct y assess adrena funct on

When evaluating cortisol levels, it is important to assess the following:

- **The overall up-and-down pattern of free cortisol throughout the day, looking for low and high levels:**
Abnorma resu ts shou d be cons dered a ong w th re ated symptoms Remember that w th ur ne resu ts, the "wak ng" samp e reflects the n ght's tota for free cort so The samp e co ected two hours after wak ng captures the cort so awaken ng response, wh ch s typ ca y the t me w th the most cort so secret on
- **The sum of the free cortisol as an expression of the overall tissue cortisol exposure:**
Th s tota of four free cort so measurements s the best way to assess the tota of free cort so throughout the day, and th s resu t corre ates reasonab y we to a true 24 hour ur ne free cort so Do be aware that th s measurement does not take nto account trans tory sh fts n cort so n the ate morn ng or ear y afternoon
- **The total level of cortisol metabolites:**
We ca th s ca cu at on "Metabo zed Cort so " wh ch s the sum of a THF, b THF and b THE (the most abundant cort so metabo tes) Wh e free cort so s the best assessment for t ssue eve s of cort so , t on y represents 1 3% of the tota produced The ma or ty of cort so resu ts n a ur ne metabo te and the tota of these metabo tes best represents the tota g andu ar output of cort so for the day When overa product on s much h gher than free cort so eve s, cort so c earance may be ncreased (as seen n hyperthyro d sm, obes ty, etc) The most common reason for s ugg sh cort so c earance (assumed when free cort so eve s are much h gher than metabo zed cort so) s ow thyro d

TEST NAME: DUTCH Complete Female Sample Report

Overall free cortisol levels are within range, but metabolized cortisol (the best marker for overall cortisol production) is low. This implies that overall HPA-Axis A is low. Cortisol clearance may be a bit sluggish, which keeps free cortisol levels within range in spite of low overall production. Hypothyroidism and other conditions may lead to slow cortisol metabolism. If treating the patient for potential thyroid issues be sure to take into account the interplay between the thyroid and adrenals.

- **A potential preference for cortisol or cortisone (the inactive form):**

Look ng at the compar son between the tota for free cort so and free cort sone s NOT the best nd cat on of a person s preference for cort so or cort sone The k dney converts cort so to cort sone n the oca t ssue Th s oca zed convers on can be seen by compar ng cort so (free) and cort sone eve s To see the pat ent's preference system ca y, t s best to ook at wh ch *metabolite* predom nates (THF or THE) Th s preference can be seen n the fan sty e gauge Th s s known as the 11b HSD ndex The enzyme 11b HSD converts cort so to cort sone n the k dneys, sa va g and and co on 11b HSD s more act ve n the ver, fat ce s and the per phery and s respons b e for react vat ng cort sone to cort so Both are then metabo zed by 5a reductase to become tetrahydrocort so (THF) and tetrahydrocort sone (THE) respect ve y

The patient s THF/THE and cortisol to cortisone ratios imply a preference for cortisone (relative to cortisol). Because cortisol levels are not low, this may have some beneficial effect in keeping cortisol levels from being even higher than reported here.

Nutritional Organic Acids

The fo ow ng three organ c ac ds are funct ona markers for v tam n defic ency These compounds essent a y back up n human b ochem stry when a key nutr ent s m ss ng These three metabo tes have fa r y stra ghtforward nterpretat ons When the markers are e evated, t s ke y that the pat ent s ce u ar eve s of the re ated nutr ent may be nsuffic ent

Methylmalonate (MMA)

Methy ma onate (a so known as methy ma on c ac d or MMA) s a funct ona marker of v tam n B12 (a so known as coba am n) defic ency When ce u ar eve s of B12 are ow e ther from defic ency or due to a B12 transporter gene mutat on, eve s of MMA ncrease Th s marker s cons dered super or to measur ng serum B12 eve s d rect y A 2012 pub cat on by M er showed that 20% of those tested had a genet c defect n the prote n that transports B12 to ce s These pat ents may have a funct ona B12 defic ency even f serum eve s of B12 are norma
f eve s of MMA are e evated, t may be adv sab e to ncrease B12 consumpt on Common foods h gh n B12 nc ude beef ver, sard nes, amb, w d caught sa mon, grass fed beef, nutr t ona yeast and eggs V tam n B12 eve s can a so be ncreased through supp ementat on of B12 (taken as coba am n, methy coba am n, hydroxycoba am n, or adenosy coba am n)
Symptoms of a v tam n B12 defic ency nc ude: fat gue, bra n fog, memory prob ems, musc e weakness, unsteady ga t, numbness, t ng ng, depress on, m gra nes/headaches and ow b ood pressure

Xanthurenate

Xanthurenate (a so known as xanthuren c ac d) s a funct ona marker of v tam n B6 (a so known as pyr dox ne) V tam n B6 s a cr t ca co factor to over 100 mportant react ons that occur n the human body and s stored n the h ghest concentrat ons n musc e t ssue Tryptophan s read y converted to NAD by the ver One of the steps n th s pathway requ res B6 When there s nsuffic ent B6, xanthurenate s made nstead
Not on y s xanthurenate an nd cator of a ack of B6, t s a so harmfu to the human body t comp exes w th nsu n and decreases nsu n sens t v ty n fact, rats fed xanthurenate w actua y deve op d abetes because of the effects on nsu n f xanthurenate eve s are e evated, B6 supp ementat on may be cons dered Food h gh n B6 nc ude turkey breast, grass fed beef, p nto beans, avocado, p stach os, ch cken, sesame and sunflower seeds
Wh e there s a ways some tryptophan go ng down the ynuren ne pathway towards NAD (and poss b y xanthurenate), th s process s up regu ated by nflammat on, estrogen and cort so f eve s of estrogen or cort so are h gh, t may exacerbate xanthurenate e evat ons and ncrease the need for B6
Xanthurenate can a so b nd to ron and create a comp ex that ncreases DNA ox dat ve damage resu t ng n h gher 8 OHdG eve s f both markers are e evated, there s ke y an ant ox dant nsuffic ency

Pyroglutamate

Pyrog utamate (a so known as pyrog utam c ac d) s a funct ona marker of g utath one defic ency Pyrog utamate s a step n the product on/recyc ng of g utath one f the body cannot convert pyrog utamate forward, t w show up e evated n the ur ne H gh pyrog utamate s an estab shed marker for g utath one defic ency
G utath one s one of the most potent ant ox dants n the human body t s espec a y mportant n gett ng r d of tox ns, nc ud ng the react ve qu none spec es formed by 4 OH E1 and 4 OH E2 Th s react ve spec es can damage DNA f not detox fied by e ther methy at on or g utath one
Some have reported that ow pyrog utamate may a so be nd cat ve of a need for g utath one; however, th s s not estab shed n the sc ent fic terature

Neurotransmitter Metabolites

The neurotransm tters dopam ne, norep nephr ne and seroton n are mportant for human hea th Measur ng neurotransm tters d rect y (d rect test ng of seroton n, for examp e) s d fficu t because of the r nstab ty and the r ur nary measurements are controvers a w th respect to how we they reflect the body's eve s of these neuro hormones Each of these three neurotransm tters can be assessed nd rect y by measur ng the r ur ne metabo tes Wh e these metabo tes are not a perfect reflect on of what's go ng on n the bra n, the sc ent fic terature does affirm the r use for a good representat on of overa eve s of these neurotransm tters

Homovanillate (HVA)

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Homovan ate (a so known as HVA) s the pr mary metabo te of dopam ne, a bra n and adrena neurotransm tter that comes from tyros ne (w th BH4 and ron as co factors) and goes on to create norep nephr ne (noradrena ne) and ep nephr ne (adrena ne)
Low eve s of HVA can be due to ow eve s of dopam ne or poor convers on of dopam ne to HVA The atter may be due to nsuffic ent eve s of SAM, Magnes um, FAD and NAD wh ch are needed to metabo ze dopam ne Low c rcu at ng dopam ne may be due to nsuffic ent BH4, ron or tyros ne t may a so be seen when adrena funct on s genera y ow Low dopam ne eve s may be assoc ated w th add ct ons, crav ngs and p easure seek ng (to boost eve s) n add t on to s eep ness, mpu s v ty, tremors, ess mot vat on, fat gue and ow mood
E evated HVA may be caused by genera y ncreased adrena hormone output or because of a copper or v tam n C defic ency (wh ch are needed for dopam ne convers on to norep nephr ne) E evat ons may a so be caused by a number of med cat ons or supp ements nc ud ng: MAO nh b tors, quercet n, tyros ne, DL pheny a an ne (DLPA), L dopa, macuna, dopam ne med cat on (Levodopa, S nemet, Methy dopa), SNR med cat on (We butr n), tr cyc c ant depressants, amphetam nes, appet te suppressants, and caffe ne Bananas a so conta n dopam ne E evated dopam ne may be assoc ated w th oss of memory, nsomn a, ag tat on, hyperact v ty, man a, hyper focus, h gh stress and anx ety as we as add ct ons, crav ngs and p easure seek ng (to ma nta n h gh eve s)
When HVA s very h gh, cons der f the prev ous y d scussed foods, supp ements or med cat ons may be the cause Rare y, tumors assoc ated w th ncreased HVA may be present n these cases, further test ng s necessary for d agnos s H gh HVA a one s not d agnost c of a tumor

Vanilmandelate (VMA)

Van mande ate (a so known as VMA) s the pr mary metabo te of norep nephr ne and ep nephr ne (adrena ne) The adrena g and makes cort so and DHEA as we as norep nephr ne and ep nephr ne When adrena hormone output s genera y ow, VMA eve s may be ow f HVA eve s are s gn ficant y h gher than VMA, there may be a convers on prob em from dopam ne to norep nephr ne Th s case can be caused by a copper or v tam n C defic ency The enzymes COMT (methy at on) and MAO are needed to make VMA from norep nephr ne f these enzymes are not work ng proper y, VMA may be ow when c rcu at ng norep nephr ne and/or ep nephr ne are not ow Low eve s of norep nephr ne and ep nephr ne may be assoc ated w th add ct ons, crav ngs, fat gue, ow b ood pressure, ow musc e tone, nto erance to exerc se, depress on, oss of a ertness
When the body s under phys ca or psycho og ca stress, VMA eve s may ncrease Because dopam ne gets converted to norep nephr ne and u t mate y to VMA, the st of med cat ons and supp ements that ncrease HVA may a so ncrease VMA
E evated eve s may be assoc ated w th fee ng stressed, aggress on, v o ence, mpat ence, anx ety, pan c, worry, nsomn a, parano a, ncreased t ng ng/burn ng, oss of memory, pa n sens t v ty, h gh b ood pressure and heart pa p tat ons
f VMA and HVA are both extreme y h gh, t may be necessary to ru e out a neurob ast c tumor

Melatonin (measured as 6-OHMS)

Me aton n s not techn ca y an adrena or sex hormone however t s h gh y nvo ved n the ent re endocr ne system t s made n sma amounts n the p nea g and n response to darkness and st mu ated by Me anocyte St mu at ng Hormone (MSH) A ow MSH s assoc ated w th nsomn a, an ncreased percept on of pa n, and mo d exposure P nea me aton n (me aton n s a so made n s gn ficant quant t es n the gut) s assoc ated w th the c rcad an rhythm of a hormones (nc ud ng fema e hormone re ease) t s a so made n sma amounts n the bone marrow, ymphocytes, ep the a ce s and mast ce s
Stud es have shown that a ur ne samp e co ected upon wak ng has eve s of 6 Hydroxyme aton n su fate (6 OHMS) that corre ate we to the tota eve s of me aton n n b ood samp es taken cont nuous y throughout the n ght The DUTCH test uses the wak ng samp e on y to test eve s of me aton n product on
Low me aton n eve s may be assoc ated w th nsomn a, poor mmune response, const pat on, we ght ga n or ncreased appet te E evated me aton n s usua y caused by ngest on of me aton n through me aton n supp ementat on or eat ng me aton n conta n ng foods E evated me aton n product on that s prob emat c s rare, but eve s can be h gher n pat ents w th Chron c Fat gue Syndrome and may be phase sh fted (peak ng ater) n some forms of depress on

8-OHdG (8-Hydroxy-2-deoxyguanosine)

8 OHdG (8 hydroxy 2 deoxyguanos ne) resu ts can be seen on page 6 of the DUTCH Comp ete (or DUTCH P us) report t s a marker for est mat ng DNA damage due to ox dat ve stress (ROS creat on) 8 OHdG s cons dered pro mutagen c as t s a b omarker for var ous cancer and degenerat ve d sease n t at on and promot on t can be ncreased by chron c nflammat on, ncreased ce turnover, chron c stress, hypertens on, hyperg ycem a/pre d abetes/d abetes, k dney d sease, BD, chron c sk n cond t ons (psor as s/eczema), depress on, atherosc eros s, chron c ver d sease, Park nson s (ncreas ng eve s w th worsen ng stages), D abet c neuropathy, COPD, b adder cancer, or nsomn a Stud es have shown h gher eve s n pat ents w th breast and prostate cancers When eve s are e evated t may be prudent to e m nate or reduce any causes and ncrease the consumpt on of ant ox dant conta n ng foods and/or supp ements
The reference range for 8 OHdG s a more aggress ve range for Funct ona Med c ne that puts the range m t at the 80th percent e for each gender A c ass c range (average p us two standard dev at ons) wou d resu t n a range of 0 6ng/mg for women and 0 10ng/mg for men Seek ng out the cause of ox dat ve stress may be more cruc a f resu ts exceed these m ts

Urine Hormone Testing - General Information

What s actua y measured n ur ne? n b ood, most hormones are bound to b nd ng prote ns A sma fract on of the tota hormone eve s are "free" and unbound such that they are act ve hormones These free hormones are not found read y n ur ne except for cort so and cort sone (because they are much more water so ub e than, for examp e, testosterone) As such, free cort so and cort sone can be measured n ur ne and t s th s measurement that near y a ur nary cort so research s based upon n the DUTCH Adrena Profi e the d urna patterns of free cort so and cort sone are measured by LC MS/MS

A other hormones measured (cort so metabo tes, DHEA, and a sex hormones) are excreted n ur ne predom nate y after

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the add t on of a g ucuron de or su fate group (to ncrease water so ub ty for excret on) As an examp e, Ta c (Natura Sc ences, 1968 pub cat on) found that of the testosterone found n ur ne, 57 80% was testosterone g ucuron de, 14 42% was testosterone su fate, and neg g b e amounts (<1% for most) was free testosterone The most ke y source of free sex hormones n ur ne s from contam nat on from hormona supp ements To e m nate th s potent a , we remove free hormones from con ugates (our test ng can be used even f vag na hormones have been g ven) The g ucuron des and su fates are then broken off of the parent hormones, and the measurement s made These measurements reflect the b oava ab e amount of hormone n most cases as t s on y the free, nonprote n bound fract on n b ood/t ssue that s ava ab e for phase metabo sm (g ucuron dat on and su fat on) and subsequent ur ne excret on
D sc a mer: the fi ter paper used for samp e co ect on s des gned for b ood co ect on, so t s techn ca y cons dered "research on y" for ur ne co ect on ts proper use for ur ne co ect on has been thorough y va dated

Nordic Laboratories dutch

Dried Urine Test for Comprehensive Hormones

PATIENT:	**Sample Report**			TEST REF:	**TST-##-#####**
TEST NUMBER:	##########	COLLECTED:	dd/mm/yyyy	PRACTITIONER:	**Nordic Laboratories**
PATIENT NUMBER:	##########	RECEIVED:	dd/mm/yyyy		
GENDER:	Female	TESTED:	dd/mm/yyyy	ADDRESS:	
AGE:	35				
DATE OF BIRTH:	dd-mm-yyyy				

TEST NAME: DUTCH Complete Female Sample Report

Reference Range Determination (last updated 12.20.2018)

We a m to make the reference ranges for our DU CH tests as c n ca y appropr ate and usefu as poss b e h s nc udes the test ng of thousands of hea thy nd v dua s and comb ng through the data to exc ude those that are not cons dered "hea thy" or "norma " w th respect to a part cu ar hormone As an examp e, we on y use a premenopausa woman's data for estrogen range determ nat on f the assoc ated progesterone resu t s w th n the utea range (days 19 21 when progesterone shou d be at ts peak) We exc ude women on b rth contro or w th any cond t ons that may be re ated to estrogen product on Over t me the database of resu ts for reference ranges has grown qu te arge h s has a owed us to refine some of the ranges to opt m ze for c n ca ut ty he manner n wh ch a metabo te's range s determ ned can be d fferent depend ng on the nature of the metabo te For examp e, t wou d not make c n ca sense to te a pat ent they are defic ent n the carc nogen c estrogen metabo te, 4 OH E1 therefore the ower range m t for th s metabo te s set to zero for both men and women Modest y e evated testosterone s assoc ated w th unwanted symptoms n women more so than n men, so the h gh range m t s set at the 80th percent e n women and the 90th percent e for men Note: the 90th percent e s defined as a resu t h gher than 90% (9 out of 10) of a hea thy popu at on

C ass c reference ranges for d sease determ nat on are usua y ca cu ated by determ n ng the average va ue and add ng and subtract ng two standard dev at ons from the average, wh ch defines 95% of the popu at on as be ng "norma " When test ng cort so , for examp e, these types of two standard dev at on ranges are effect ve for determ n ng f a pat ent m ght have Add son's (very ow cort so) or Cush ng's (very h gh cort so) D sease Our ranges are set more t ght y to be opt ma y used for Funct ona Med c ne pract ces

Be ow you w find a descr pt on of the range for each test:

Female Reference Ranges (Updated 12.20.2018)

	Low%	High%	Low	High		Low%	High%	Low	High
b-Pregnanediol	20%	90%	600	2000	Cortisol A (waking)	20%	90%	12	55
a-Pregnanediol	20%	90%	200	740	Cortisol B (morning)	20%	90%	38	155
Estrone (E1)	20%	80%	12	26	Cortisol C (~5pm)	20%	90%	7.3	30
Estradiol (E2)	20%	80%	1.8	4.5	Cortisol D (bed)	0	90%	0	14
Estriol (E3)	20%	80%	5	18	Cortisone A (waking)	20%	90%	40	120
2-OH-E1	20%	80%	5.1	13.1	Cortisone B (morning)	20%	90%	90	230
4-OH-E1	0	80%	0	1.8	Cortisone C (~5pm)	20%	90%	32	95
16-OH-E1	20%	80%	0.7	2.6	Cortisone D (bed)	0	90%	0	55
2-Methoxy-E1	20%	80%	2.5	6.5	Melatonin (6-OHMS)	20%	90%	10	85
2-OH-E2	0	80%	0	1.2	8-OHdG	0	90%	0	5.2
4-OH-E2	20%	80%	0.15	0.5	Methylmalonate	0	90%	0	2.2
2-Methoxy-E2	20%	80%	0.3	0.7	Xanthurenate	0	90%	0	1.4
DHEA-S	20%	90%	20	750	Kynurenate	0	90%	0	7.3
Androsterone	20%	80%	200	1650	Pyroglutamate	10%	90%	32	60
Etiocholanolone	20%	80%	200	1000	Homovanillate	10%	95%	4	13
Testosterone	20%	80%	2.3	14	Vanilmandelate	10%	95%	2.4	6.4
5a-DHT	20%	80%	0	6.6					
5a-Androstanediol	20%	80%	12	30	**Calculated Values**				
5b-Androstanediol	20%	80%	20	75	Total DHEA Production	20%	80%	500	3000
Epi-Testosterone	20%	80%	2.3	14	Total Estrogens	20%	80%	35	70
a-THF	20%	90%	75	370	Metabolized Cortisol	20%	90%	2750	6500
b-THF	20%	90%	1050	2500	24hr Free Cortisol	20%	90%	80	230
b-THE	20%	90%	1550	3800	24hr Free Cortisone	20%	90%	220	450

% = population percentile: Example - a high limit of 90% means results higher than 90% of the women tested for the reference range will be designated as "high."

Provider Notes:

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