
HORMONAL
IMBALANCES

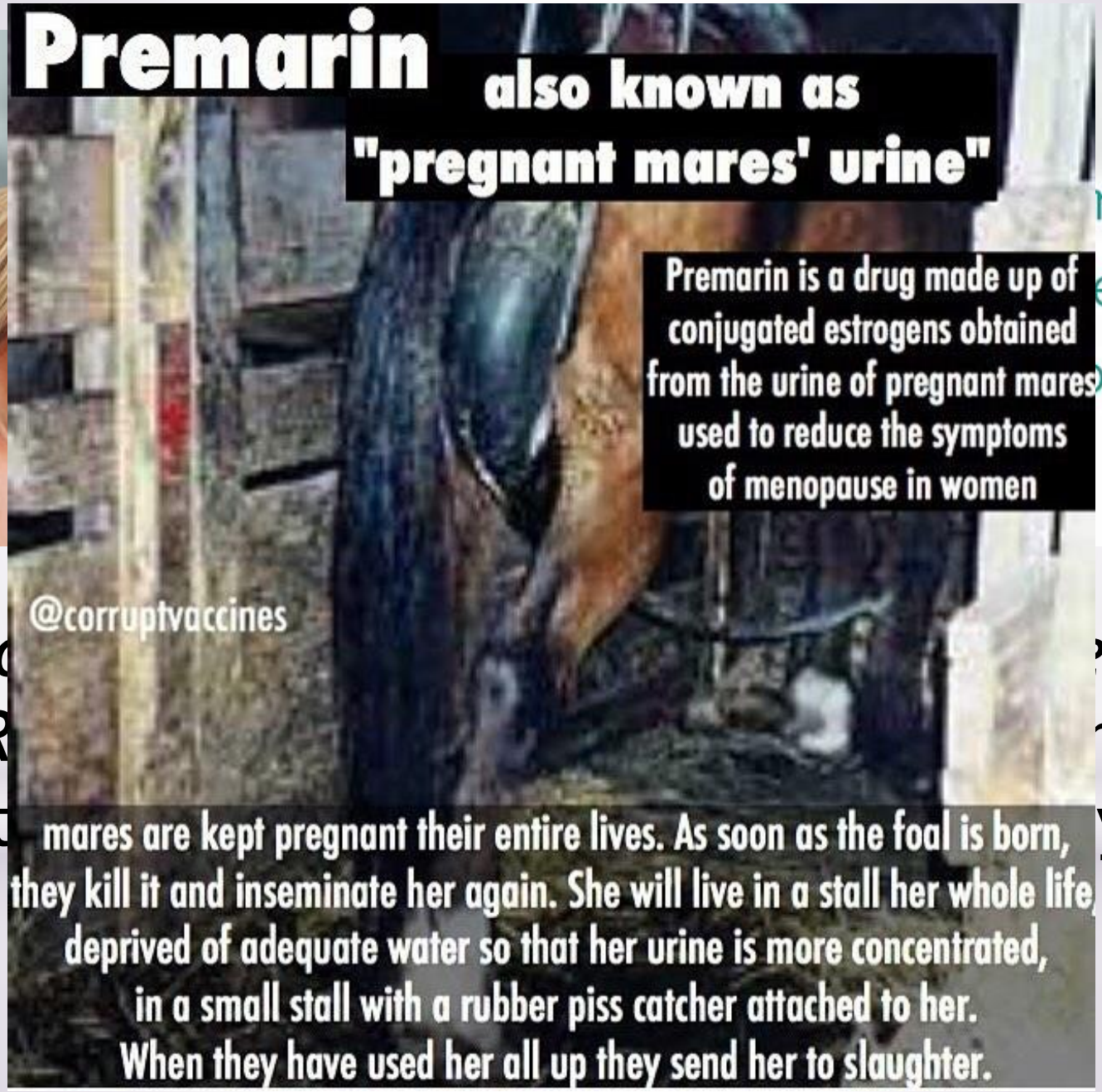
Part 1

Receive the lecture notes
Text~44222

Then~hormones

Then enter email address

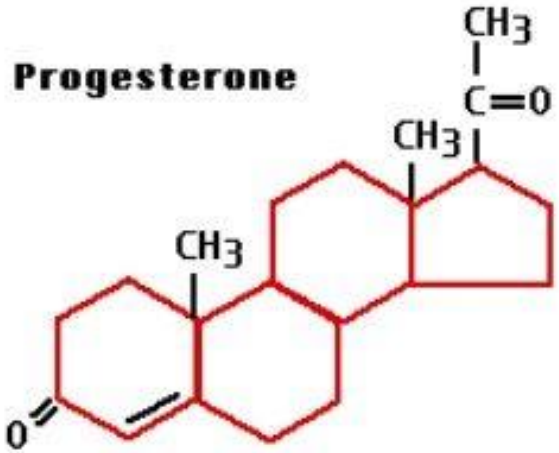
Bioidentical hormone replacement therapy (*BHRT*), also known as bioidentical hormone therapy or natural hormone therapy



Bioi *erapy*
(*BHR* mone
t y

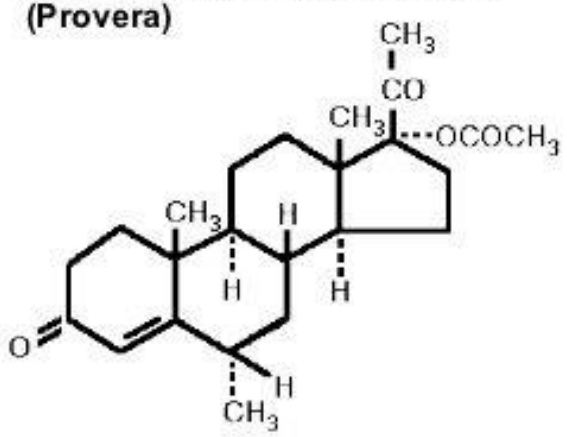
Progesterone vs Progestin

Progesterone

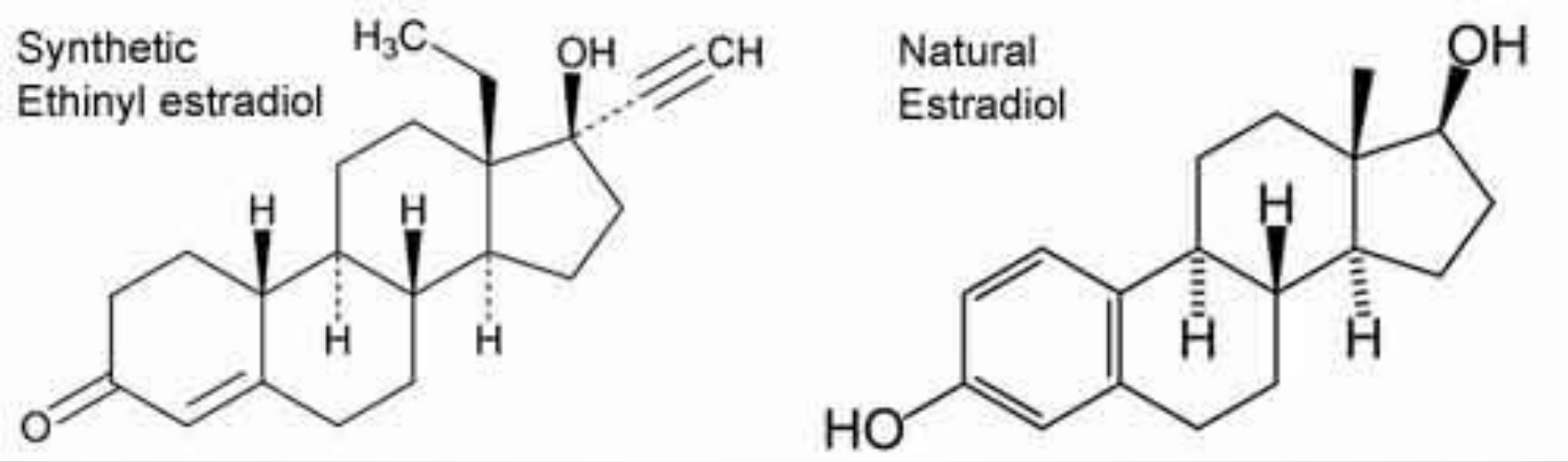


- Bio-Identical, Human
- Increases fertility

Medroxyprogesterone acetate (Provera)



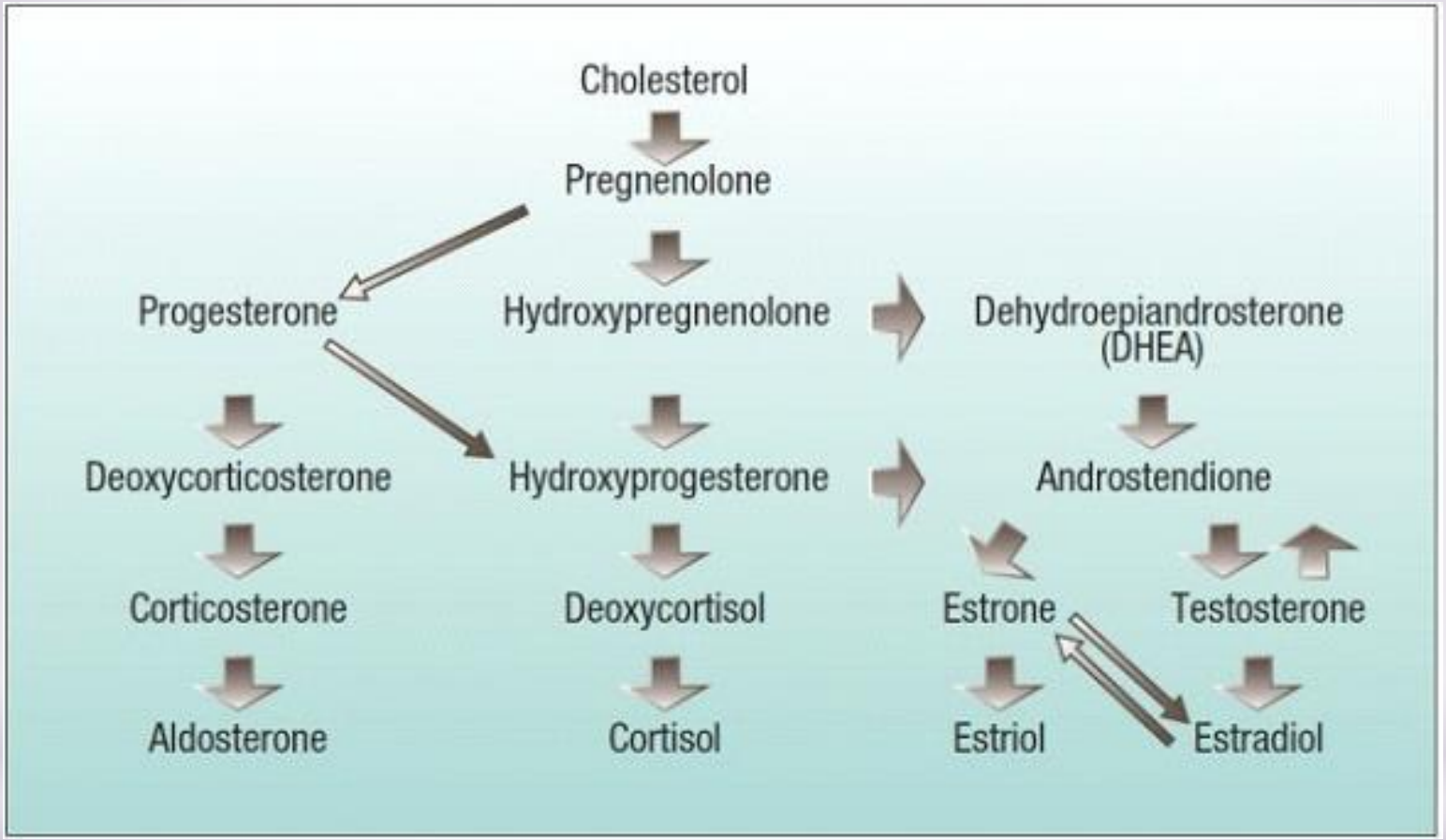
- Synthetic analog
- Contraceptive


Synthetic
Ethinyl estradiol
H3C
OH
CH
H
H
H
H
O
Natural
Estradiol
OH
H
H
H
HO

Hormones that need to be in balance

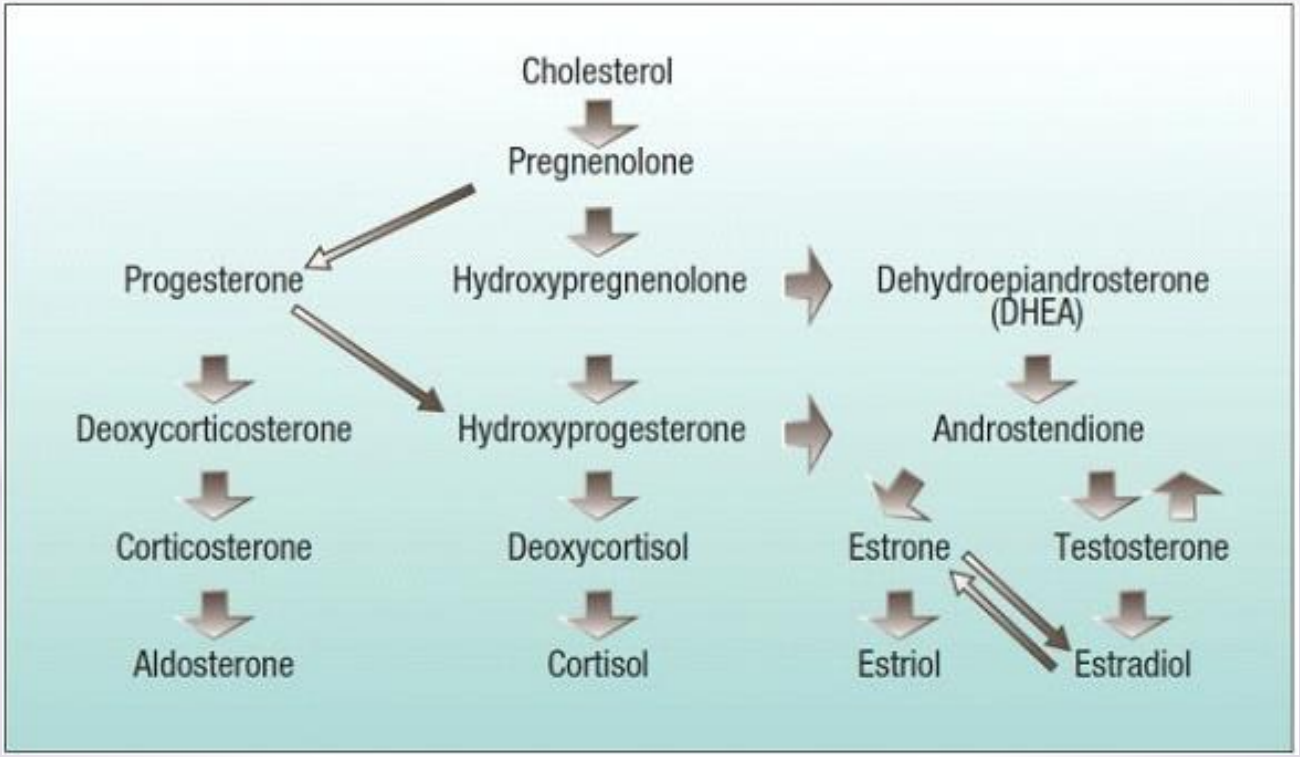
- Estrogen
- Progesterone
- DHEA
- Cortisol

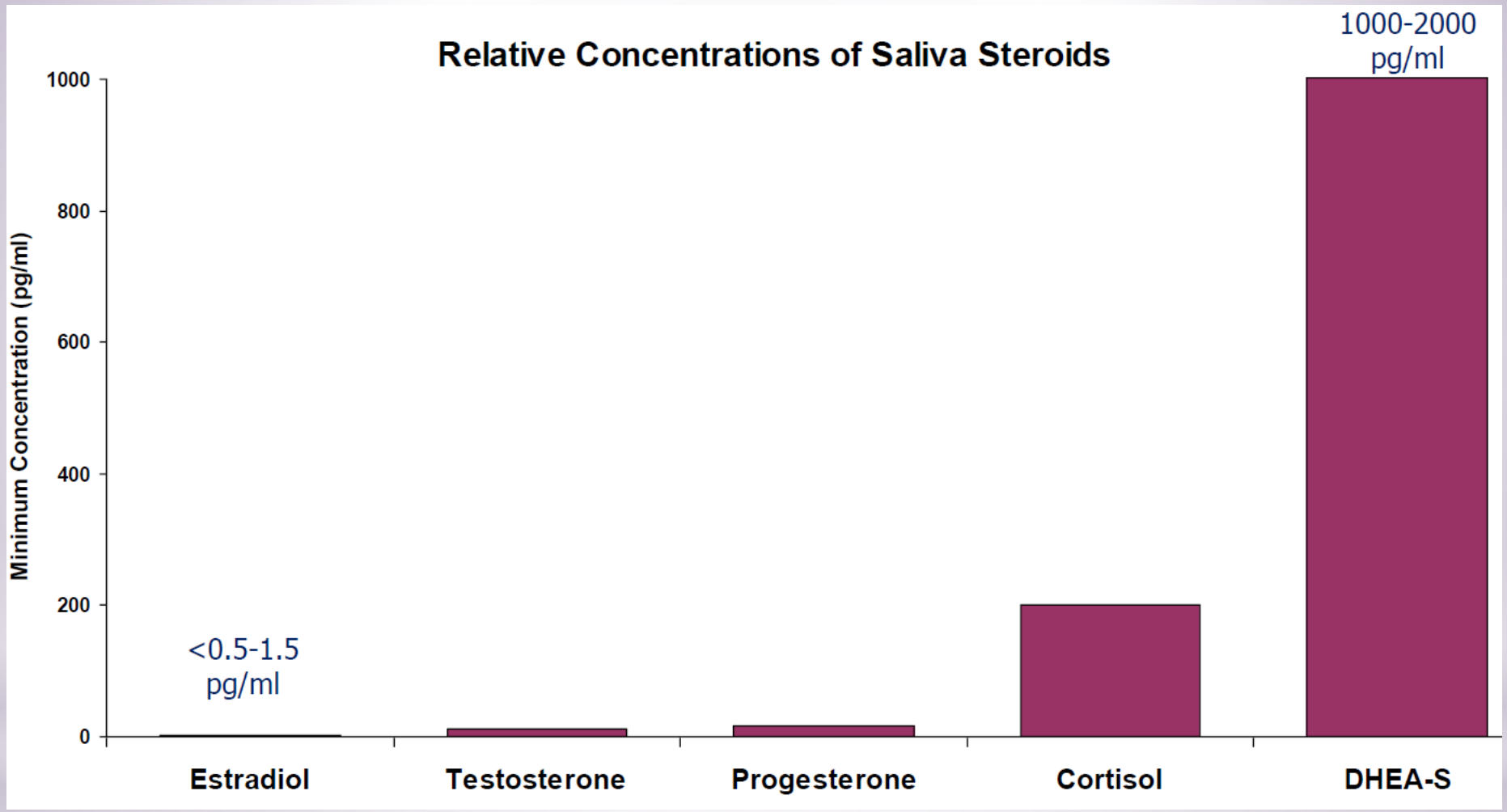
Hormone Pathway



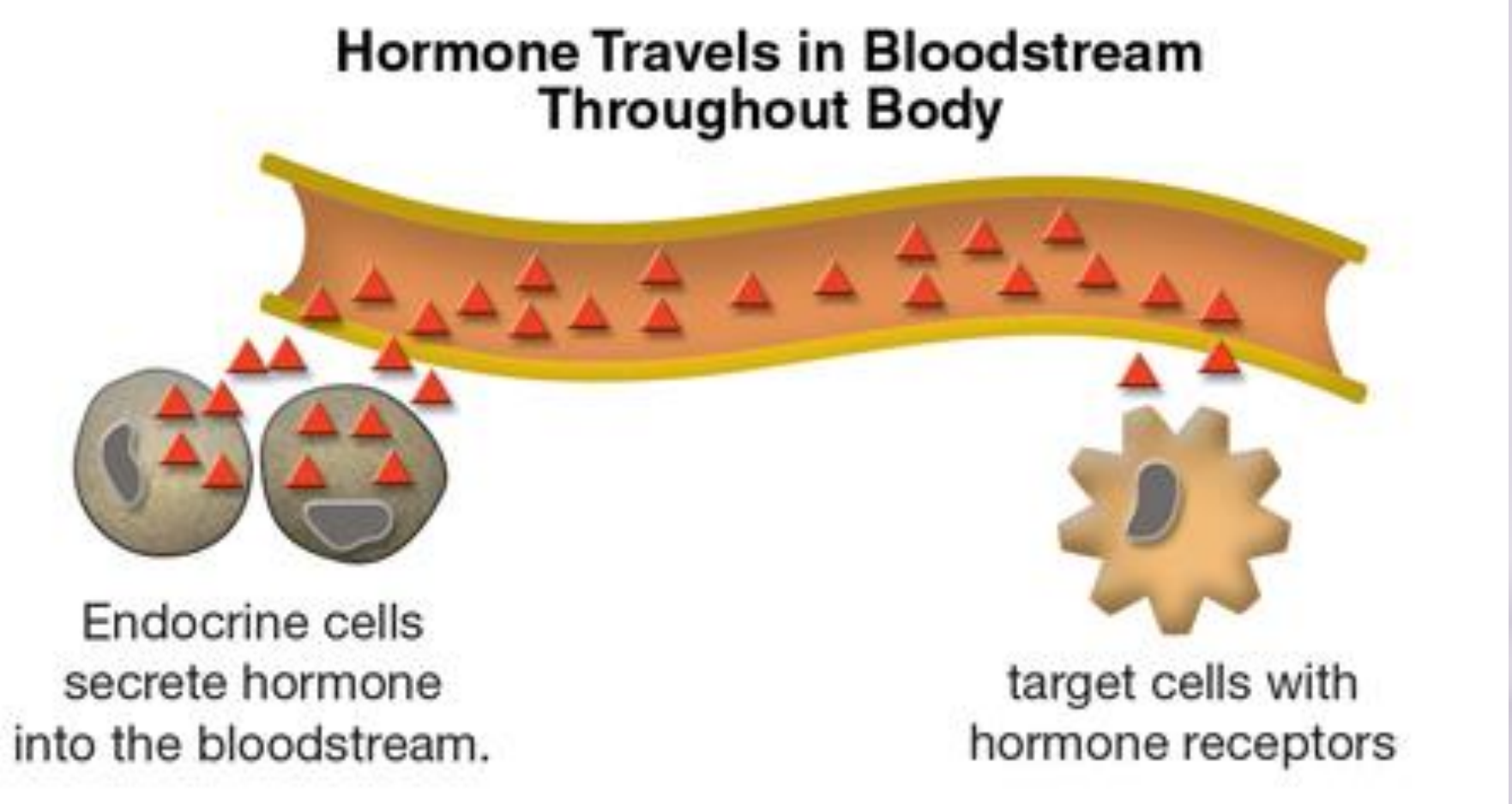
Steroid Hormones

The natural steroid hormones are synthesized from cholesterol in the gonads and adrenal glands. These forms of hormones are lipids. They can pass through the cell membrane as they are fat-soluble.



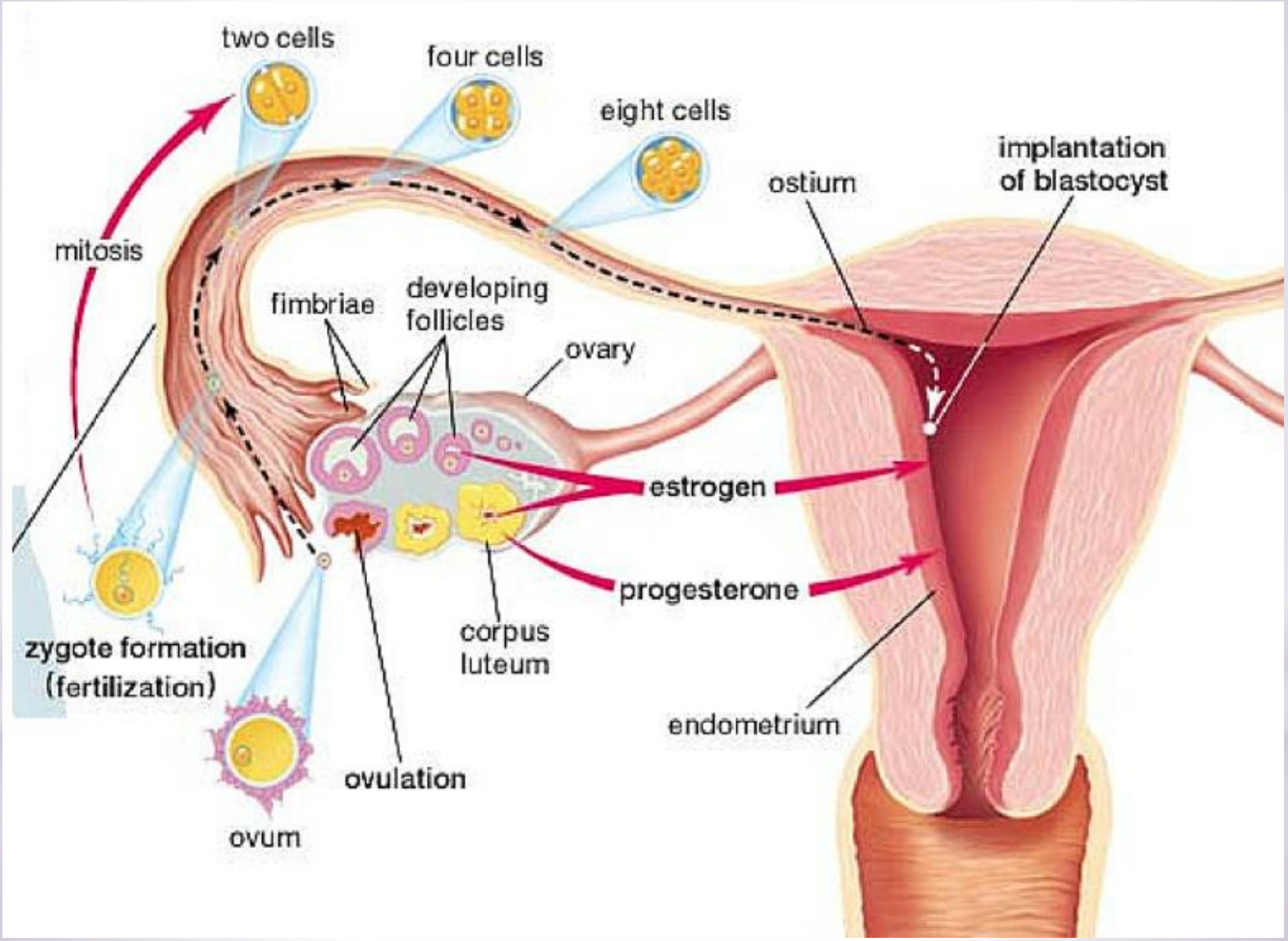

Relative Concentrations of Saliva Steroids
Minimum Concentration (pg/ml)
1000
800
600
400
200
0
<0.5-1.5 pg/ml
1000-2000 pg/ml
Estradiol
Testosterone
Progesterone
Cortisol
DHEA-S

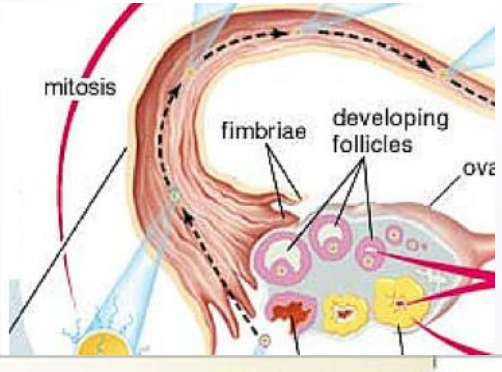
Best to test hormones is saliva

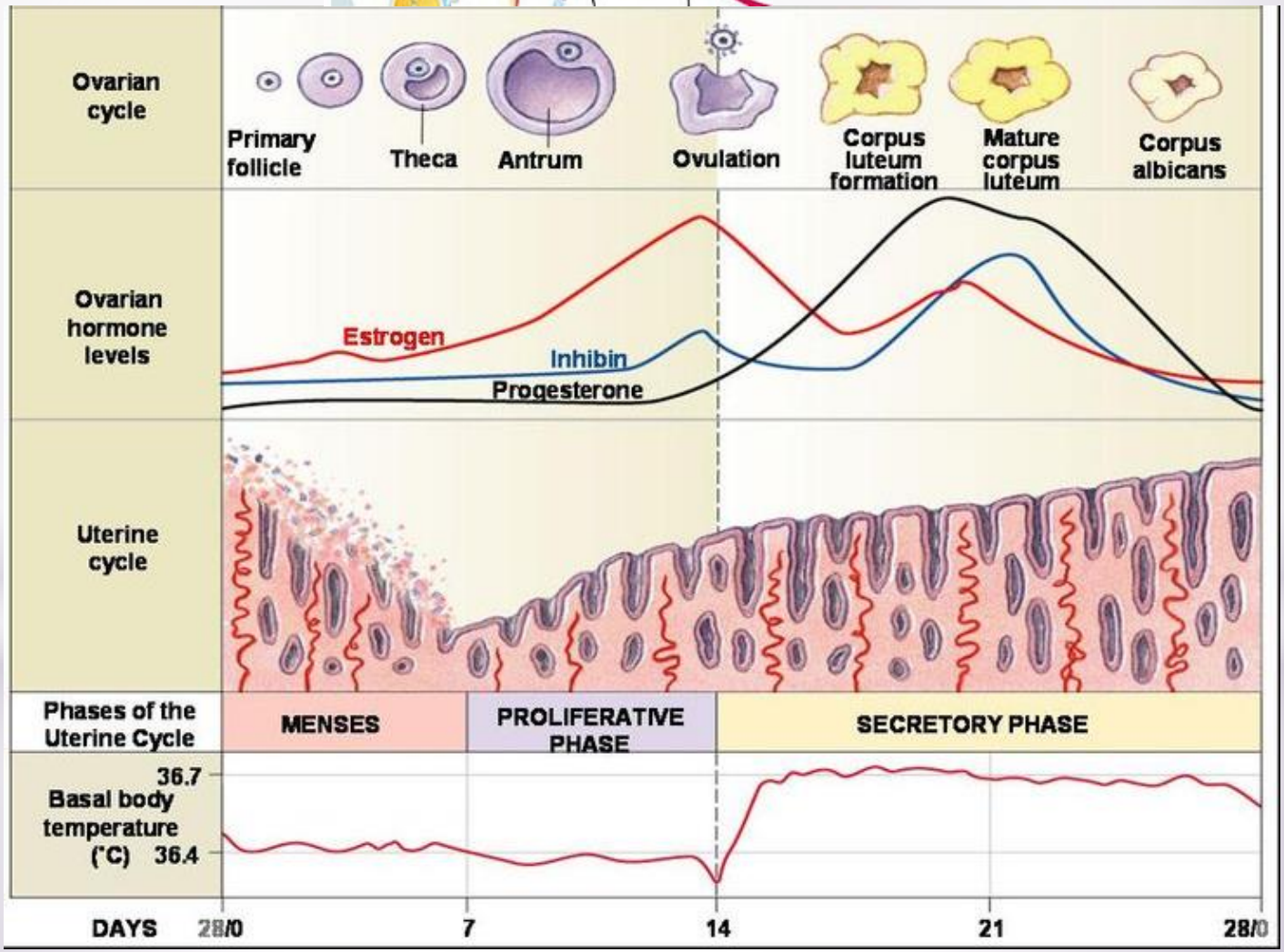


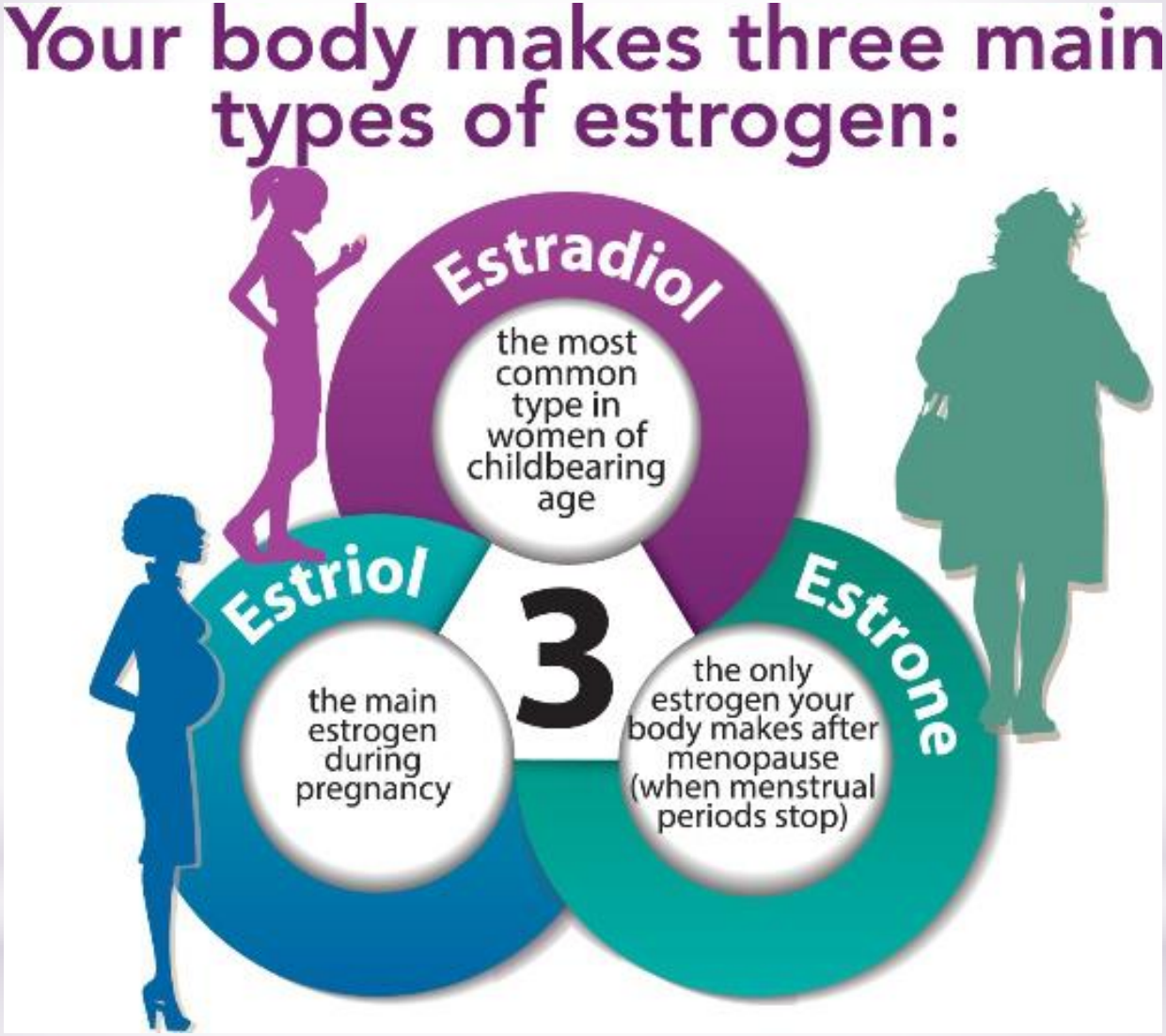
Part 2

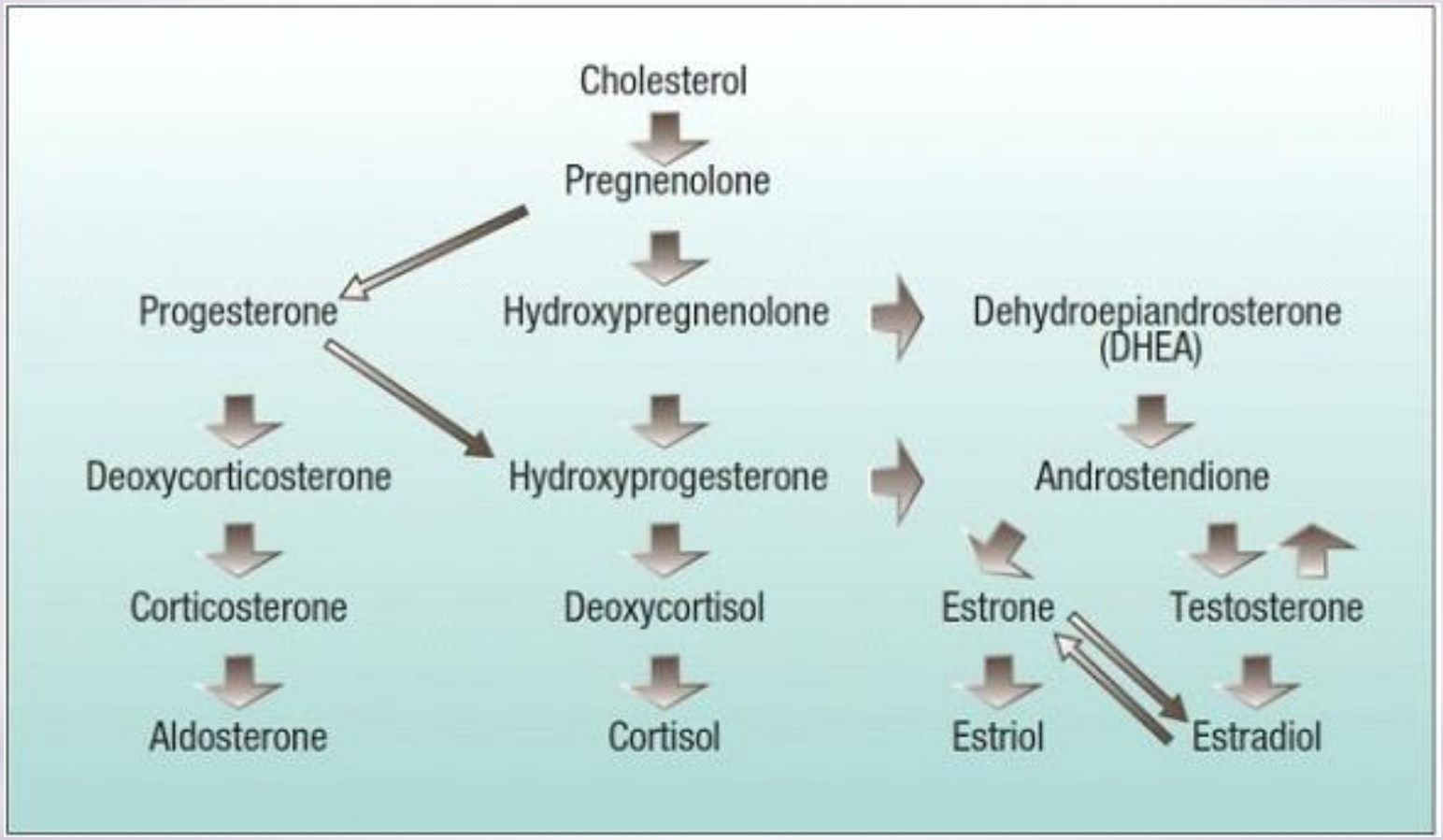
Estrogen: Estrogens, in females, are produced primarily by the ovaries and fat cells


two cells
four cells
eight cells
implantation
of blastocyst
ostium
mitosis
fimbriae
developing
follicles
ovary
estrogen
progesterone
corpus
luteum
zygote formation
(fertilization)
ovulation
endometrium
ovum


mitosis
fimbriae
developing follicles
ova


Ovarian cycle
Primary follicle
Theca
Antrum
Ovulation
Corpus luteum formation
Mature corpus luteum
Corpus albicans
Ovarian hormone levels
Estrogen
Inhibin
Progesterone
Uterine cycle
Phases of the Uterine Cycle
MENSES
PROLIFERATIVE PHASE
SECRETORY PHASE
36.7
Basal body temperature (°C)
36.4
DAYS
28/0
7
14
21
28/0


Your body makes three main types of estrogen:
Estradiol
the most common type in women of childbearing age
Estriol
the main estrogen during pregnancy
3
Estrone
the only estrogen your body makes after menopause (when menstrual periods stop)


Cholesterol
Pregnenolone
Progesterone
Hydroxypregnenolone
Dehydroepiandrosterone (DHEA)
Deoxycorticosterone
Hydroxyprogesterone
Androstendione
Corticosterone
Deoxycortisol
Estrone
Testosterone
Aldosterone
Cortisol
Estriol
Estradiol

Functions of estrogen

Estrogen has over 400 functions in the body

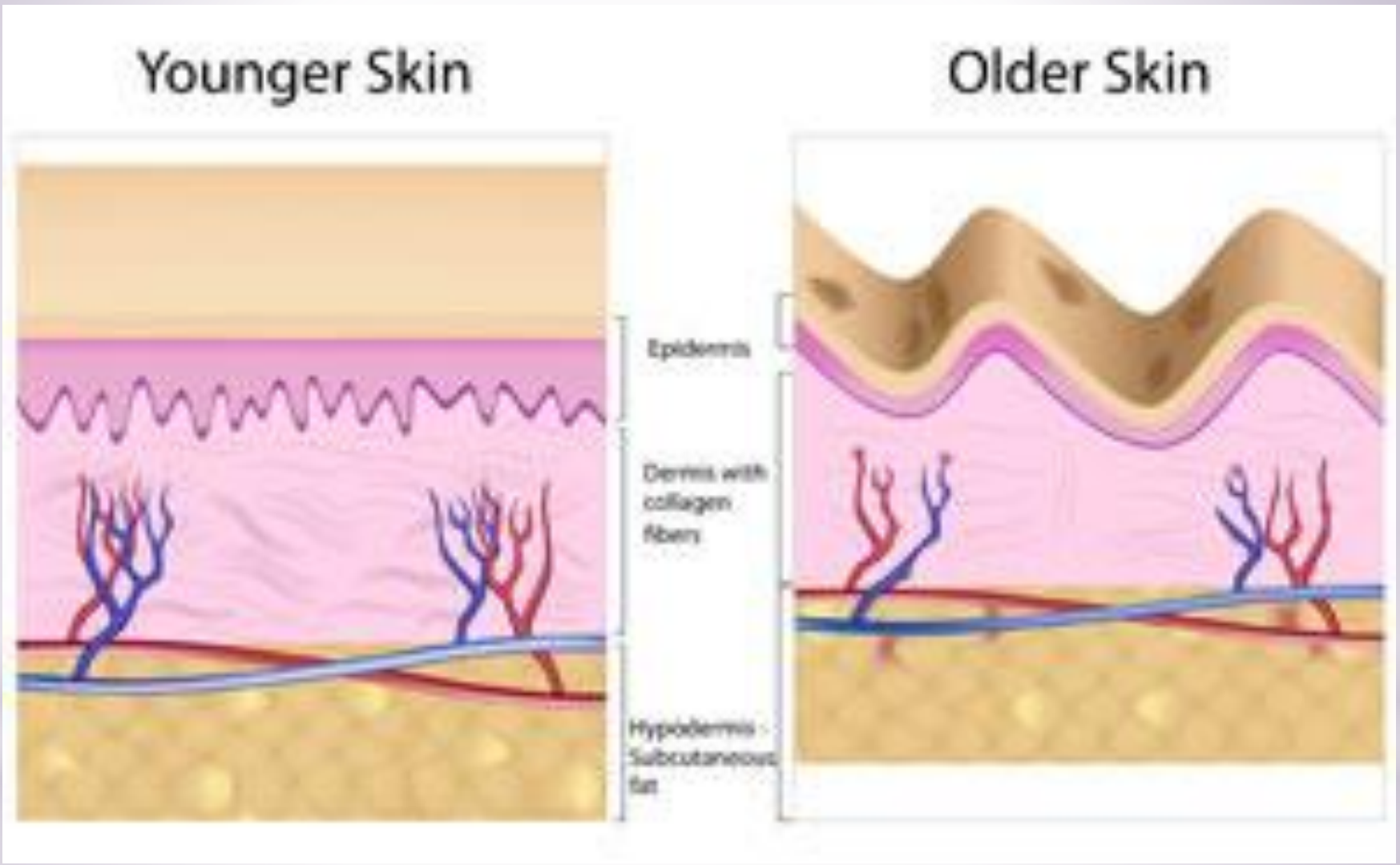
- ✓ Increased metabolic rate
- ✓ Improves insulin sensitivity
- ✓ Regulates body temperature
- ✓ Helps prevent muscle damage
- ✓ Helps maintain muscle
- ✓ Improve sleep
- ✓ Maintain elasticity of arteries
- ✓ Dilate small arteries
- ✓ Increases blood flow
- ✓ Inhibit platelet stickiness
- ✓ Decreases the accumulation of plaque in arteries
- ✓ Maintains amount of collagen in the skin
- ✓ Decreases blood pressure
- ✓ Helps maintain memory
- ✓ Increases reasoning and new ideas
- ✓ Helps with fine motor skills increases the water content of the skin and it's responsible for its thickness

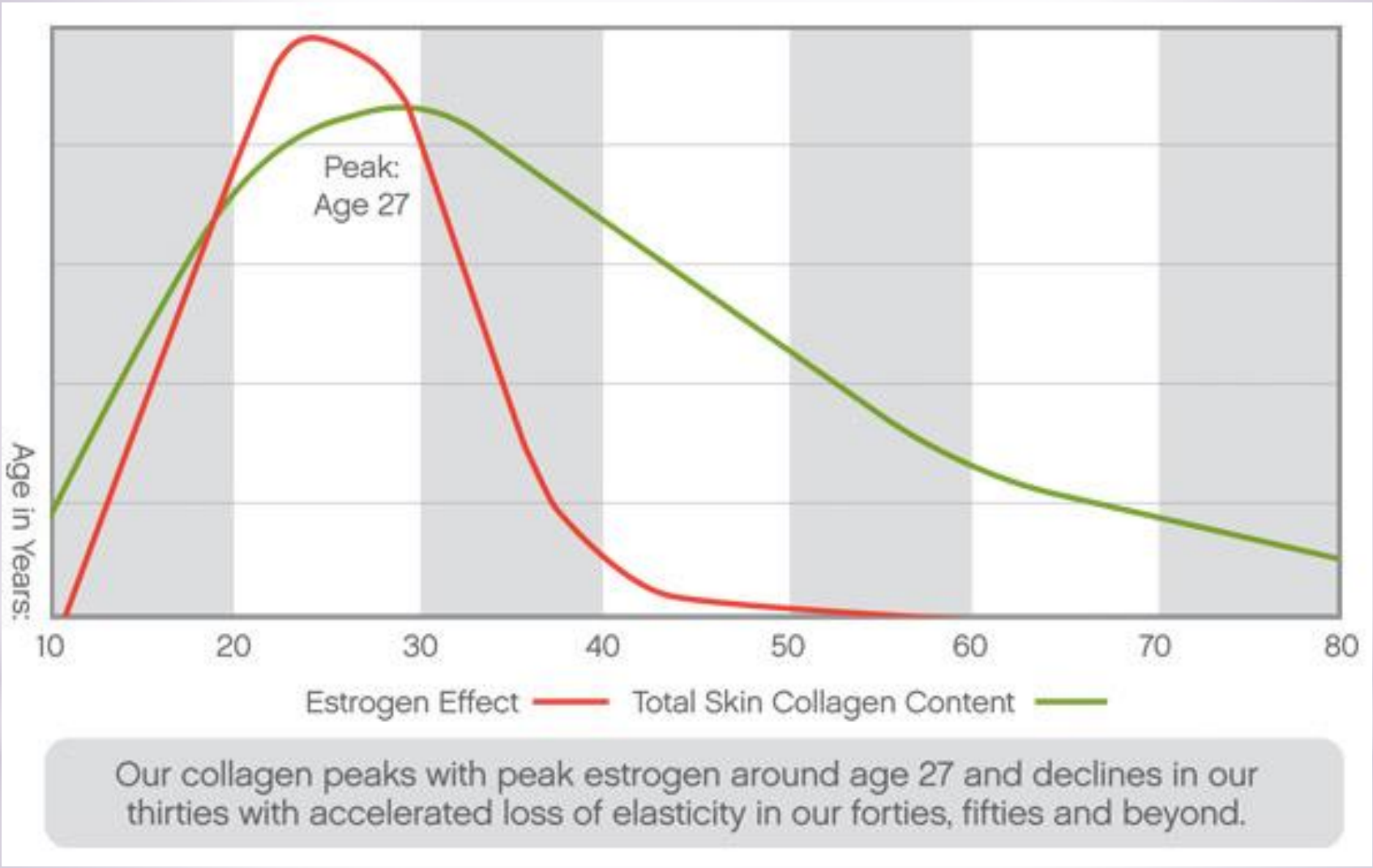
Functions of estrogen

- ✓ Reduces the overall risk of heart disease by 40 to 50% enhances energy
- ✓ Improves mood
- ✓ Increases concentration
- ✓ Maintains bone dense density
- ✓ Help prevent glaucoma
- ✓ Increases sexual interest
- ✓ Reduces homocysteine
- ✓ Decreases wrinkles
- ✓ Protects against macular degeneration
- ✓ Decreases the risk of colon cancer
- ✓ Help prevent tooth floss

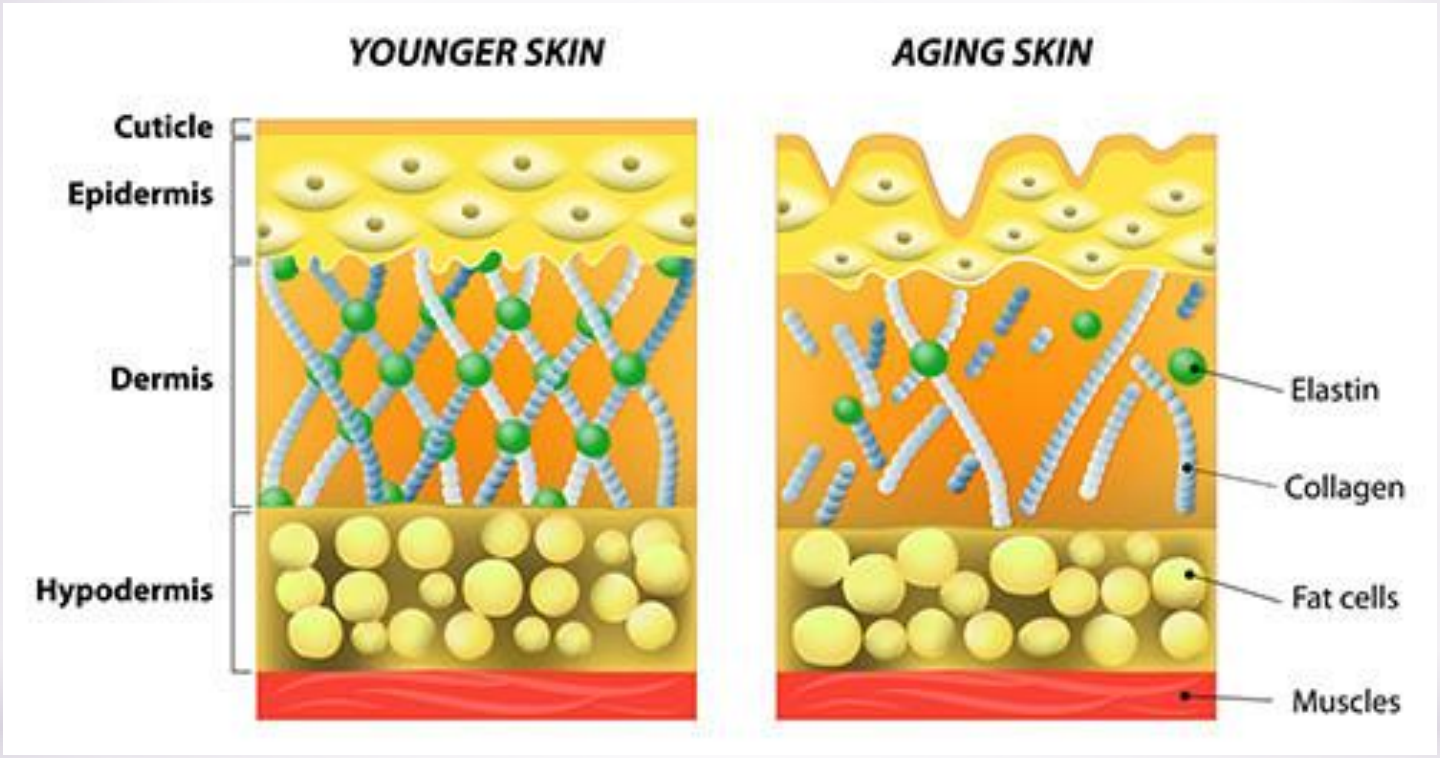
Estrogen Deficiency:

- ✓ Hot flashes, night sweats
- ✓ Insomnia, depression, fatigue, aches
- ✓ Mental deterioration: poor memory recall and increase risk of dementia
- ✓ Vaginal dryness,
- ✓ Incontinence
- ✓ Atrophy of bone, skin, and connective tissue
- ✓ Increase risk of high blood pressure
- ✓ Insulin resistance (diabetes)


Younger Skin
Older Skin
Epidermis
Dermis with collagen fibers
Hypodermis - Subcutaneous fat



Our collagen peaks with peak estrogen around age 27 and declines in our thirties with accelerated loss of elasticity in our forties, fifties and beyond.


YOUNGER SKIN
AGING SKIN
Cuticle
Epidermis
Dermis
Hypodermis
Elastin
Collagen
Fat cells
Muscles

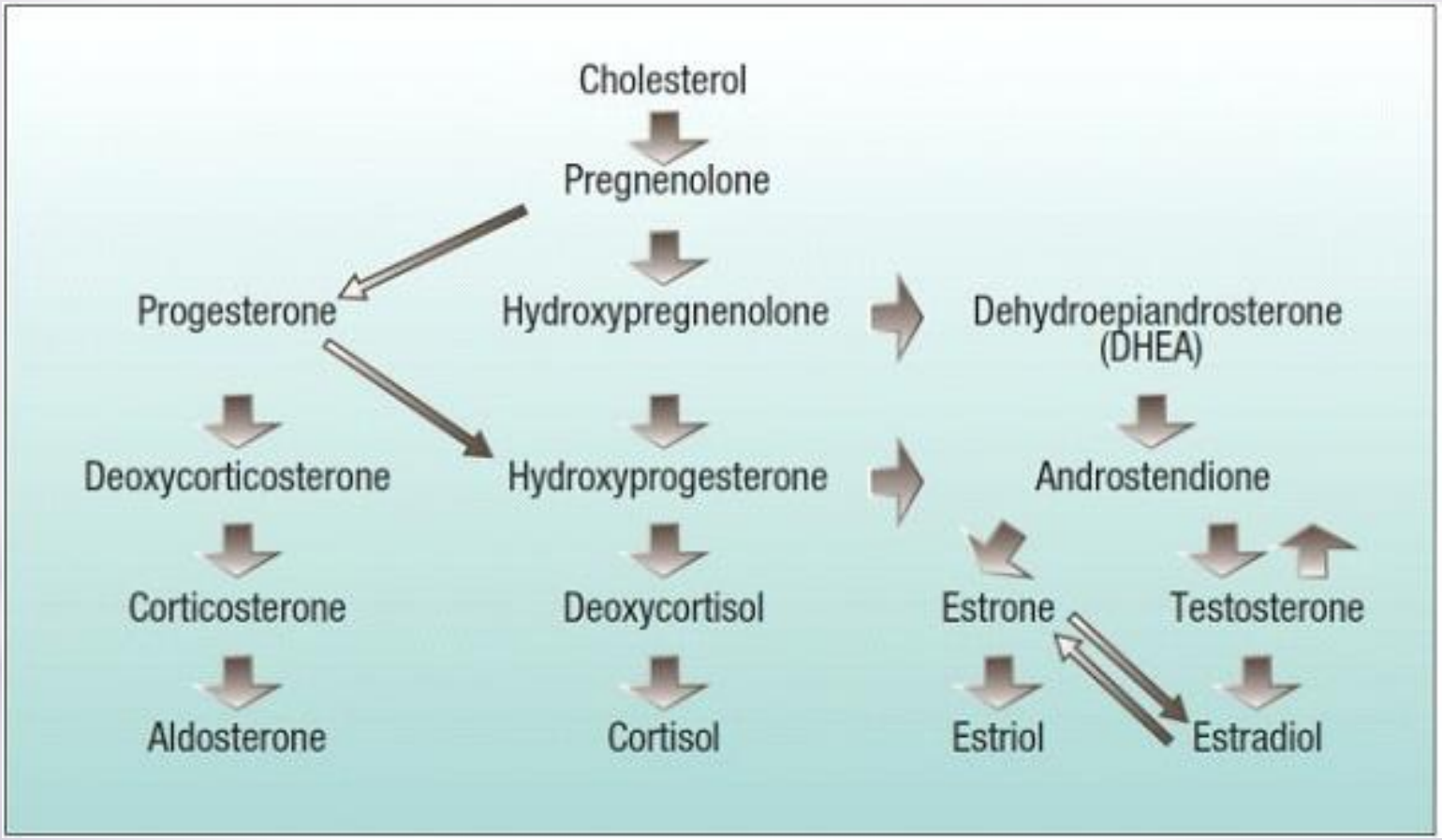
Life-Flo Biestro-care, 4-Ounce from Life-Flo

223 customer reviews | 22 answered questions

Biest 80%(E3)/20%(E2)

Part 3

Progesterone



Natural progesterone affects

- ✓ Helps balance estrogen
- ✓ Leaves the body quickly
- ✓ Improves improve sleep
- ✓ Natural calming effect
- ✓ Lowers high blood pressure
- ✓ Helps the body use and eliminate fats
- ✓ Helps balance fluids in cells
- ✓ Increases the beneficial effects of estrogen
- ✓ Increases metabolic rate
- ✓ Natural diuretic
- ✓ Natural antidepressant
- ✓ Is an anti-inflammatory
- ✓ Stimulates the production of new bone
- ✓ Enhances thyroid hormone
- ✓ Improves libido help
- ✓ Restore cell oxygen levels

Symptoms of progesterone loss

- ✓ Anxiety
- ✓ Depression
- ✓ Irritability mood swings
- ✓ and insomnia
- ✓ Pain and inflammation
- ✓ Osteoporosis
- ✓ Excessive menstruation
- ✓ Hypersensitivity nervousness migraine headaches before the cycle
- ✓ Weight gain
- ✓ Decreased libido decreased HDL's

Progesterone

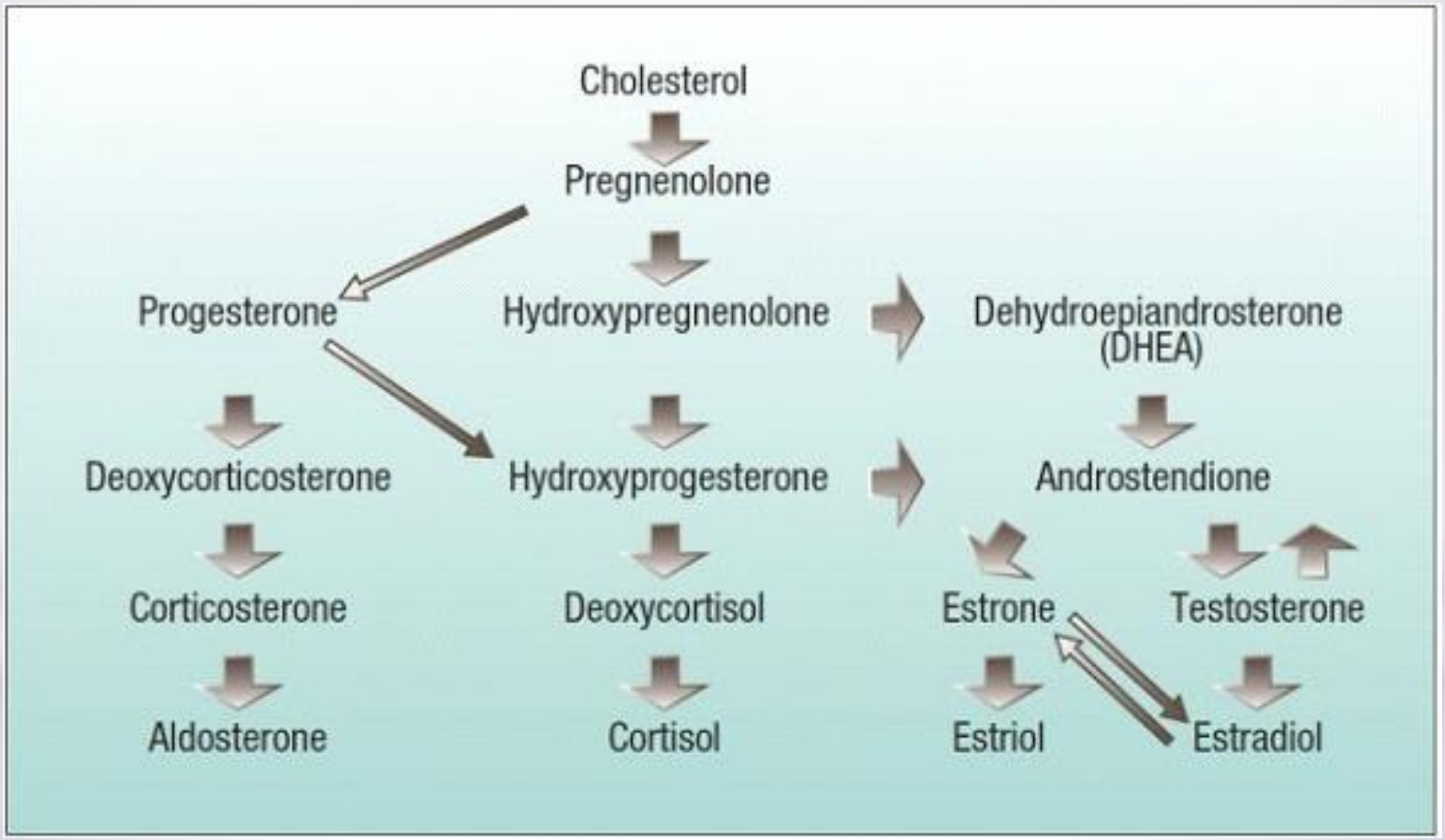
- ✓ Symptoms in midlife of lack of progesterone can cause to become irregular periods, and longer during perimenopause
- ✓ Progesterone counter acts estradiol in the breasts and uterus

- ✓ Reduced progesterone begins in early 30's causes estrogen dominance

Life-Flo Progesta-Care with Natural Progesterone Body Cream, Women's Wellness, 4-Ounce Bottle from Life-Flo

4.5 out of 5 stars ▾ 376 customer reviews | 34 answered questions

pregnenolone



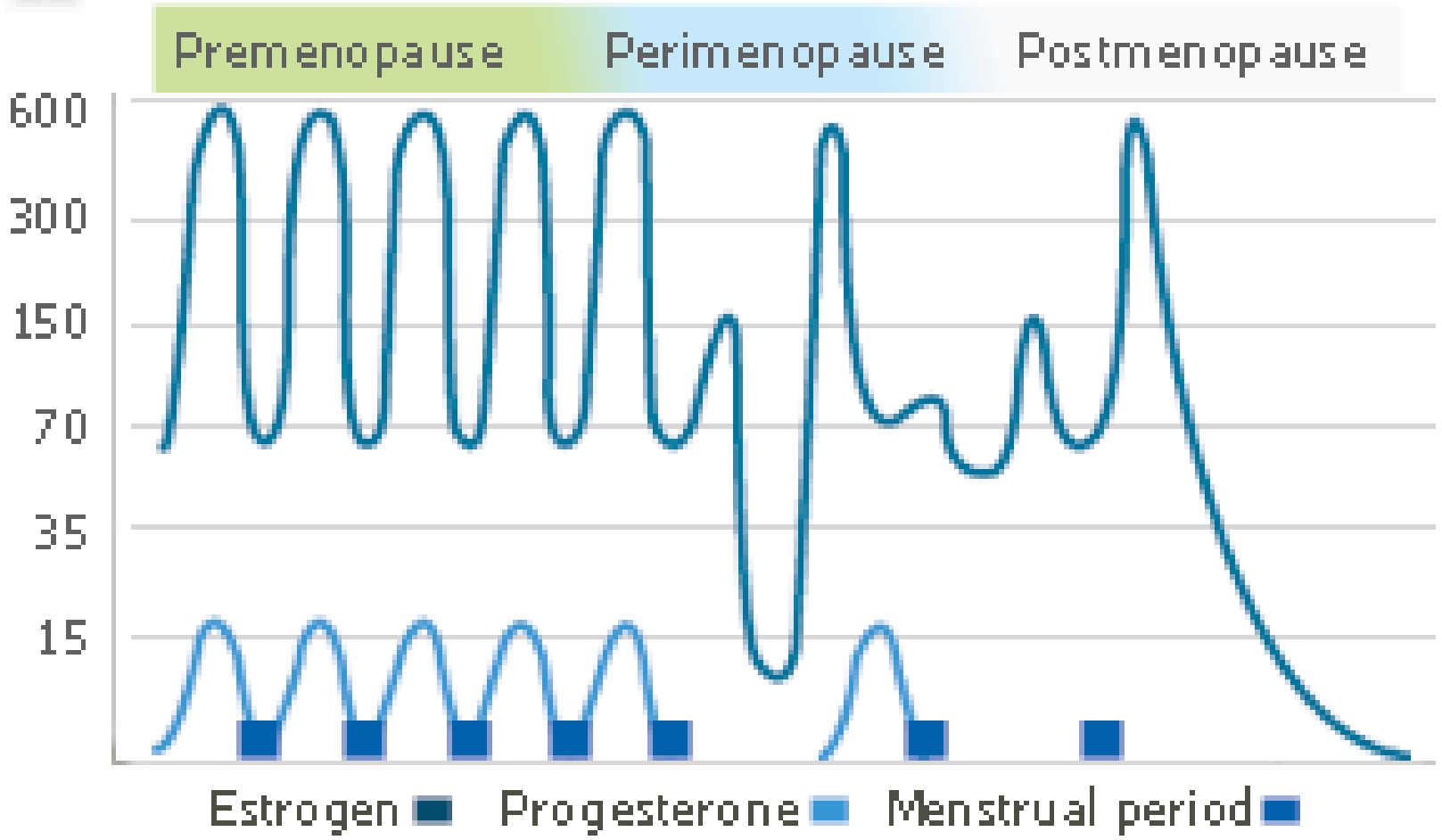
perimenopause definition:

Perimenopause means "around menopause" and refers to the time period during which a woman's body makes its natural transition toward permanent infertility (menopause)

The level of your estrogen — the main female hormone — rises and falls unevenly during perimenopause. Your menstrual cycles may lengthen or shorten, and you may begin having menstrual cycles in which your ***ovaries don't release an egg (ovulate).*** You may also experience menopause-like symptoms, such as hot flashes, sleep problems and vaginal dryness.

Menopause: is defined as occurring 12 months after your last menstrual period and marks the end of menstrual cycles.

Menopause Hormone Levels



- ✓ Breast tenderness
- ✓ Worse premenstrual syndrome
- ✓ Irregular periods
- ✓ Vaginal dryness discomfort during sex
- ✓ Urine leakage when coughing or sneezing
- ✓ Mood swings
- ✓ Trouble sleeping

34 MENOPAUSE SYMPTOMS

Most Common

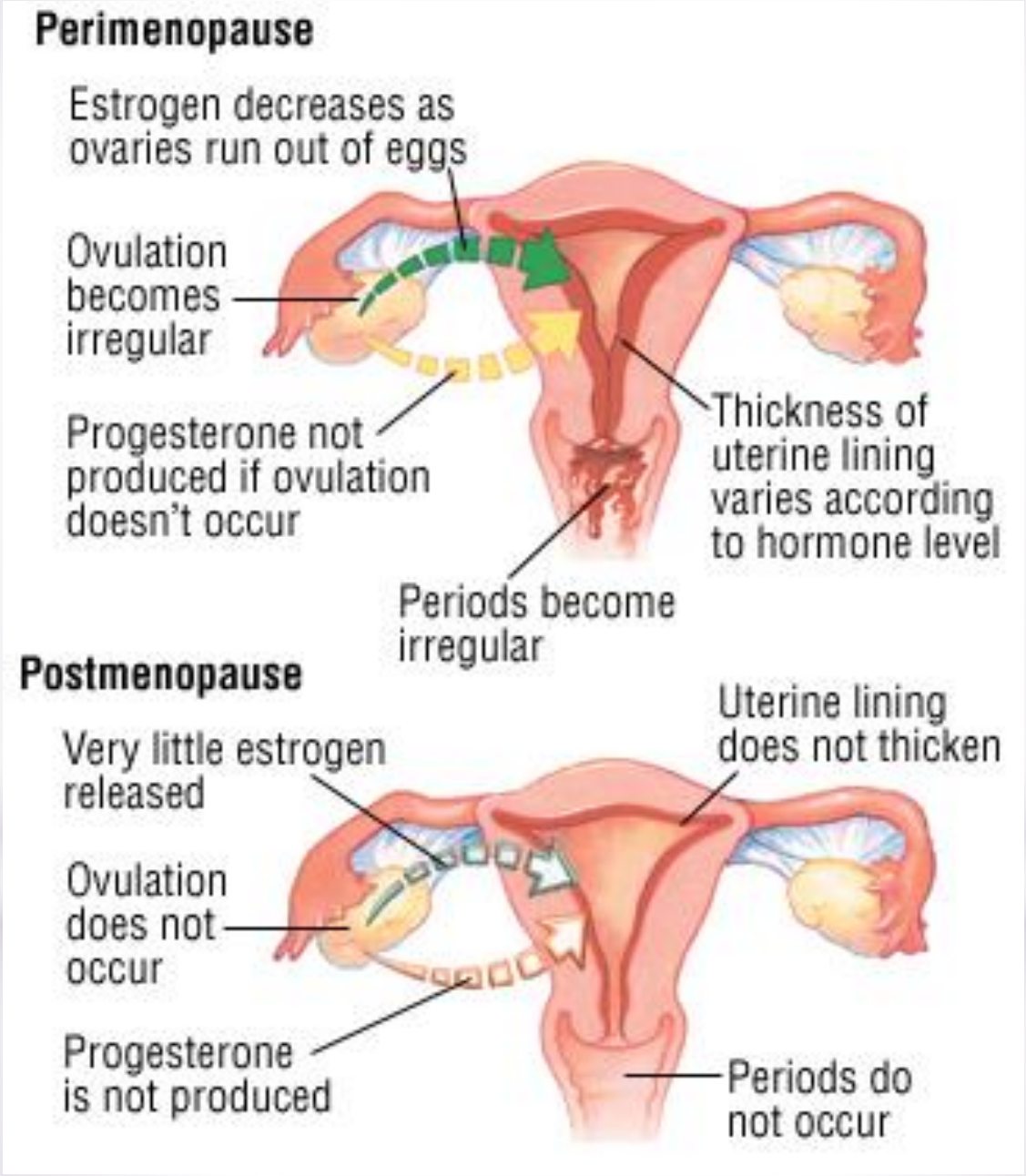
- Hot Flashes
- Night Sweats
- Irregular Periods
- Loss of Libido
- Vaginal Dryness
- Mood Swings

Pains

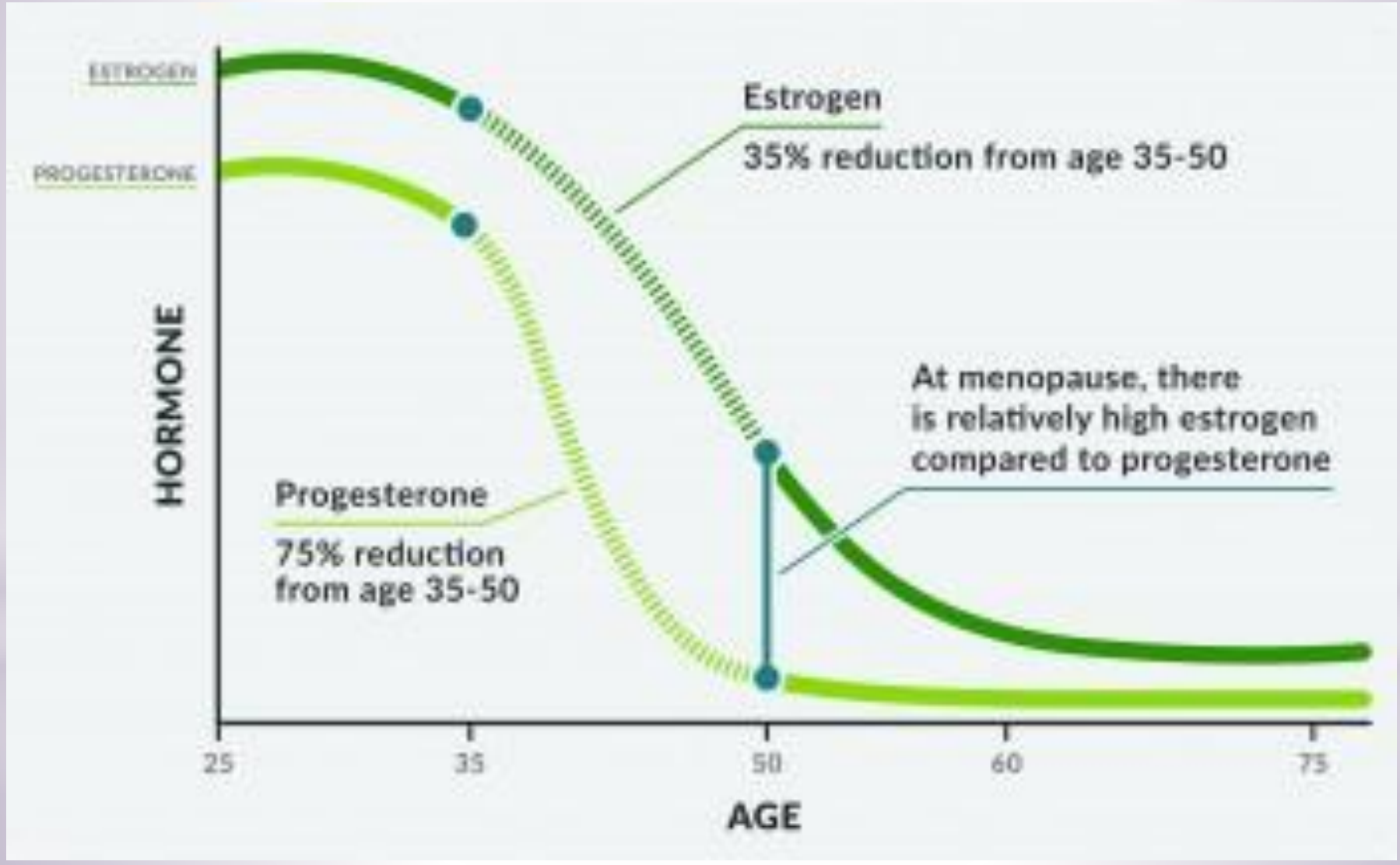
- Breast Pain
- Headaches
- Joint Pain
- Burning Tongue
- Electric Shocks
- Digestive Problems
- Gum Problems
- Muscle Tension
- Itchy Skin
- Tingling Extremities

Changes

- Fatigue
- Hair Loss
- Sleep Disorders
- Difficult Concentrating
- Memory Lapses
- Dizziness
- Weight Gain
- Incontinence
- Bloating
- Allergies
- Brittle Nails
- Changes in Odor
- Irregular Hearthbeat
- Depression
- Anxiety
- Irritability
- Panic Disorder


Perimenopause
Estrogen decreases as ovaries run out of eggs
Ovulation becomes irregular
Progesterone not produced if ovulation doesn't occur
Thickness of uterine lining varies according to hormone level
Periods become irregular
Postmenopause
Very little estrogen released
Uterine lining does not thicken
Ovulation does not occur
Progesterone is not produced
Periods do not occur

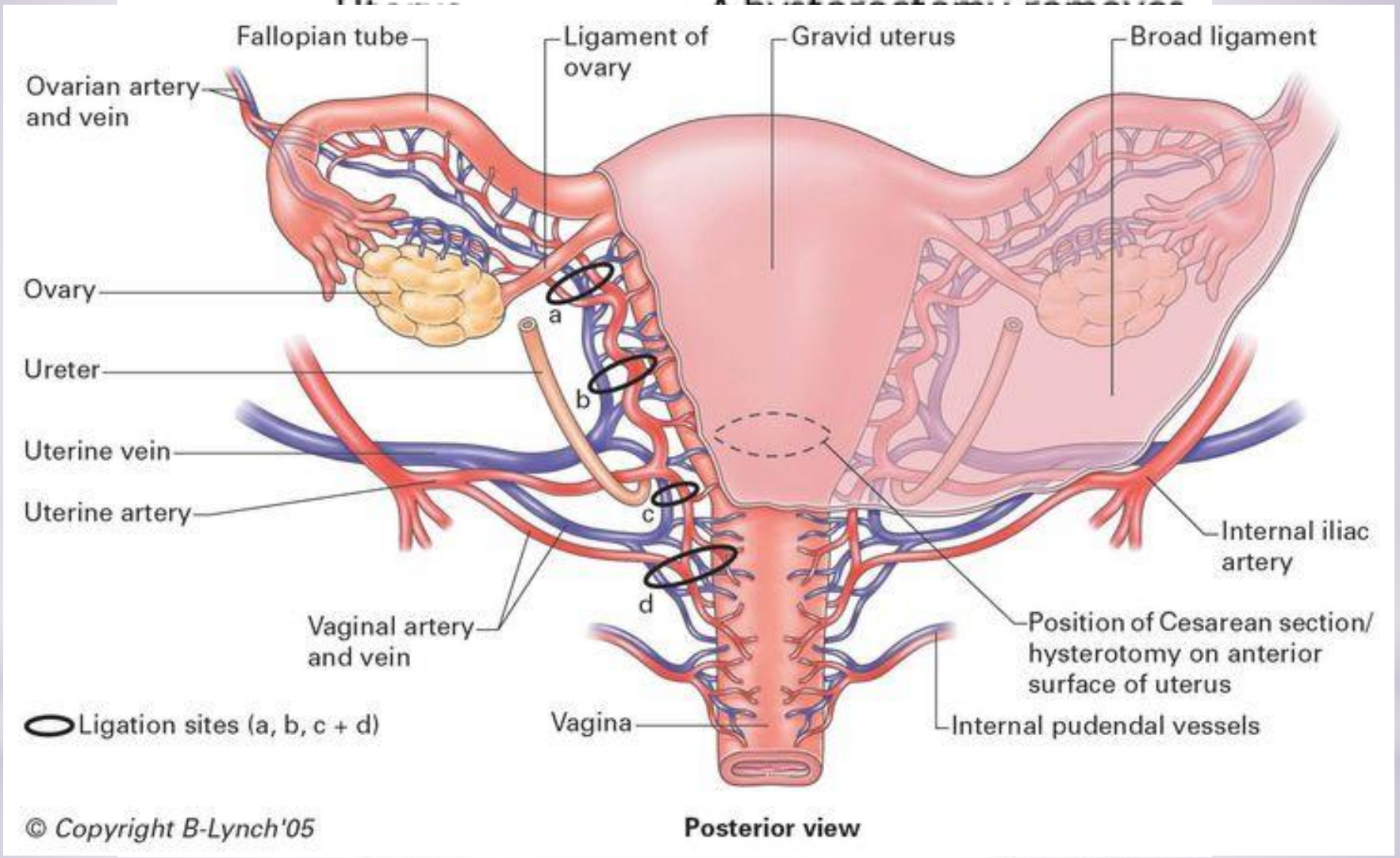
Estrogen Dominance



Xenoestrogens

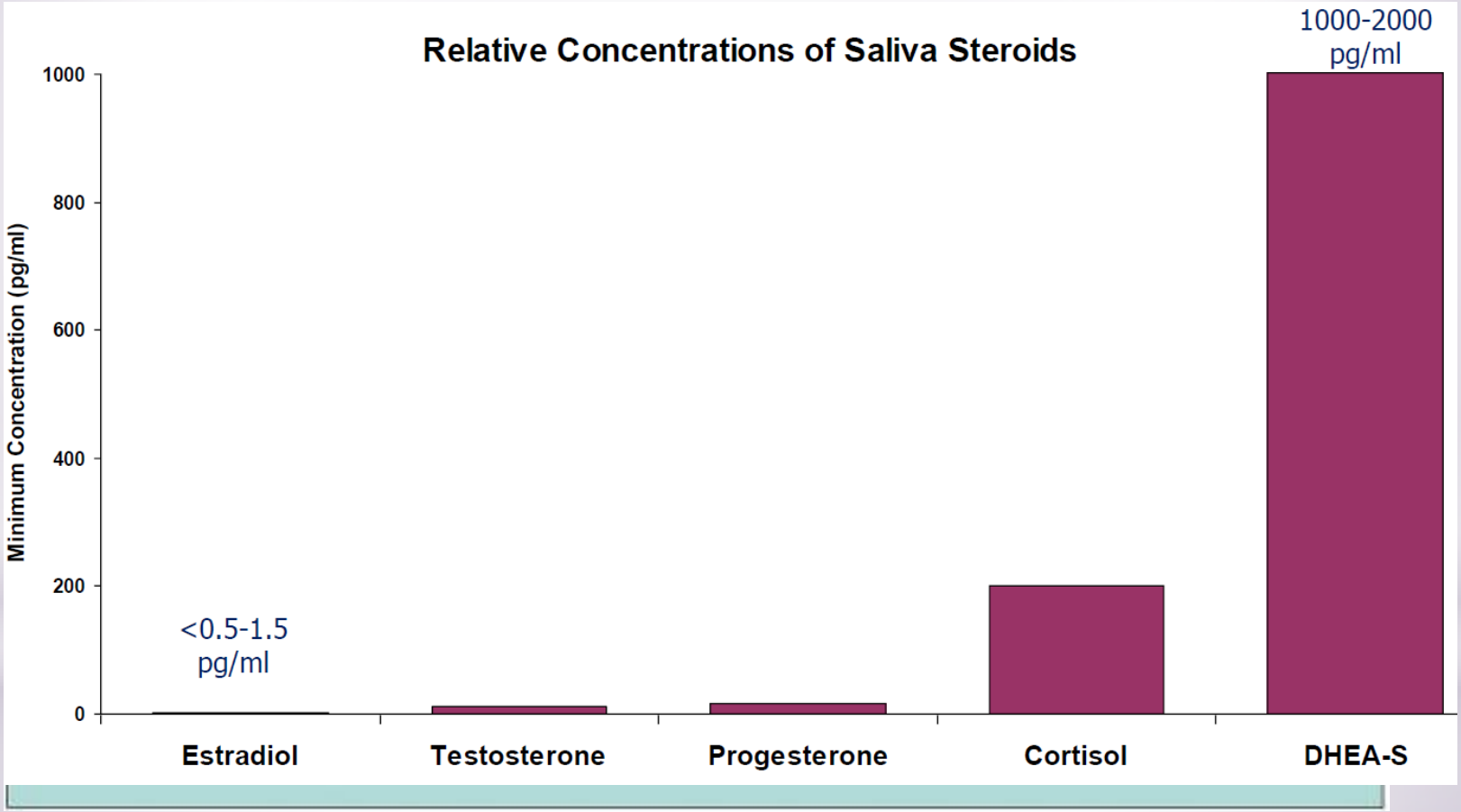
- Commercially-raised meat and diary products
- Anything that contains insecticide or pesticide residues
- Tap water
- Shampoos, lotions, soaps, toothpastes, cosmetics
- Soft plastics
- Dryer sheets

Part 4


Fallopian tube
Ligament of ovary
Gravid uterus
Broad ligament
Ovarian artery and vein
Ovary
Ureter
Uterine vein
Uterine artery
a
b
c
d
Internal iliac artery
Vaginal artery and vein
Position of Cesarean section/ hysterotomy on anterior surface of uterus
Ligation sites (a, b, c + d)
Vagina
Internal pudendal vessels
© Copyright B-Lynch'05
Posterior view

Estrogen given by mouth can increase blood pressure increased triglycerides increase estrone cause gallstones elevated liver enzymes affect serotonin metabolism lower growth hormone increased CRP increase carbohydrate cravings

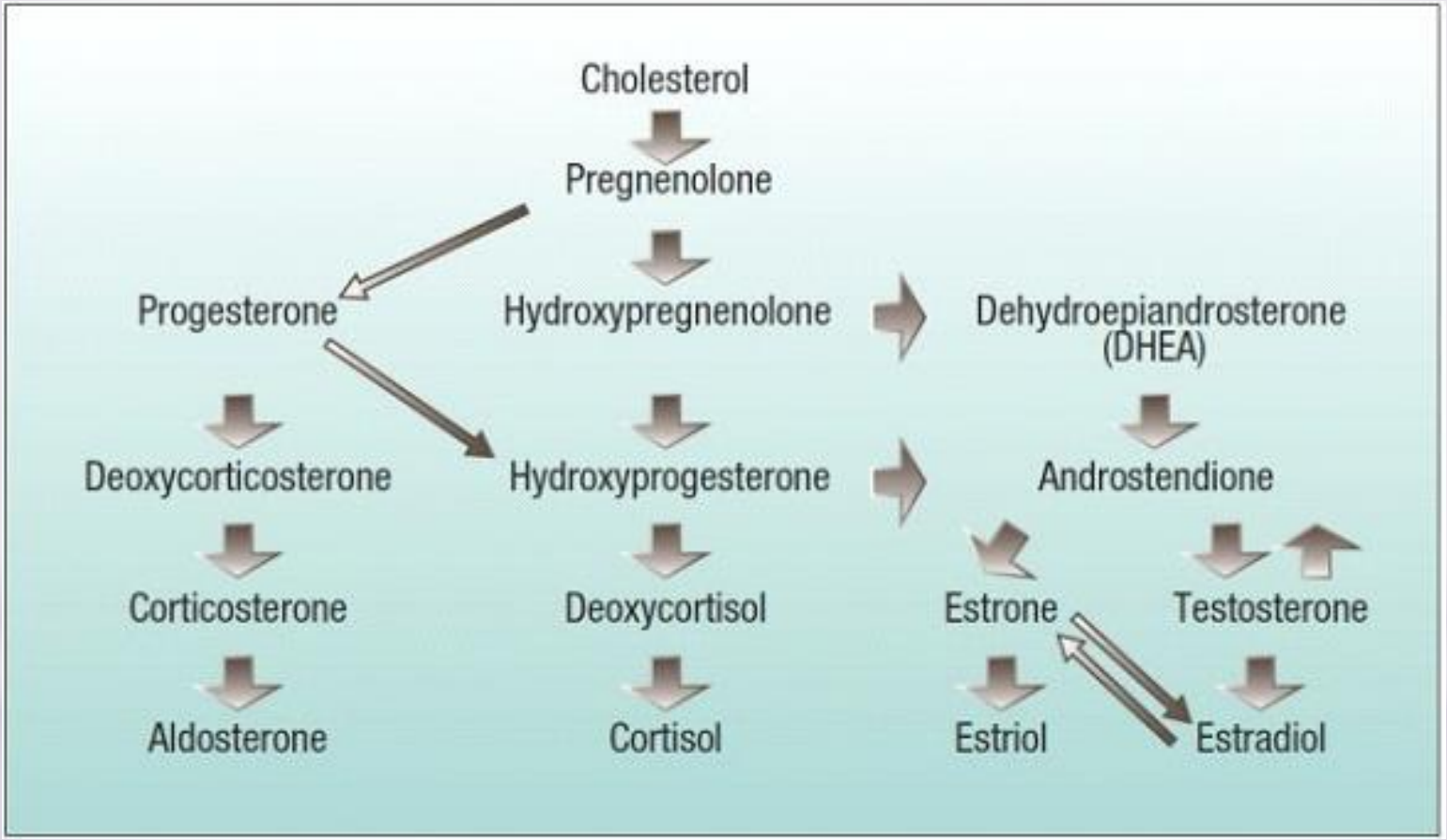
DHEA


Relative Concentrations of Saliva Steroids
Minimum Concentration (pg/ml)
1000
800
600
400
200
0
<0.5-1.5 pg/ml
1000-2000 pg/ml
Estradiol
Testosterone
Progesterone
Cortisol
DHEA-S

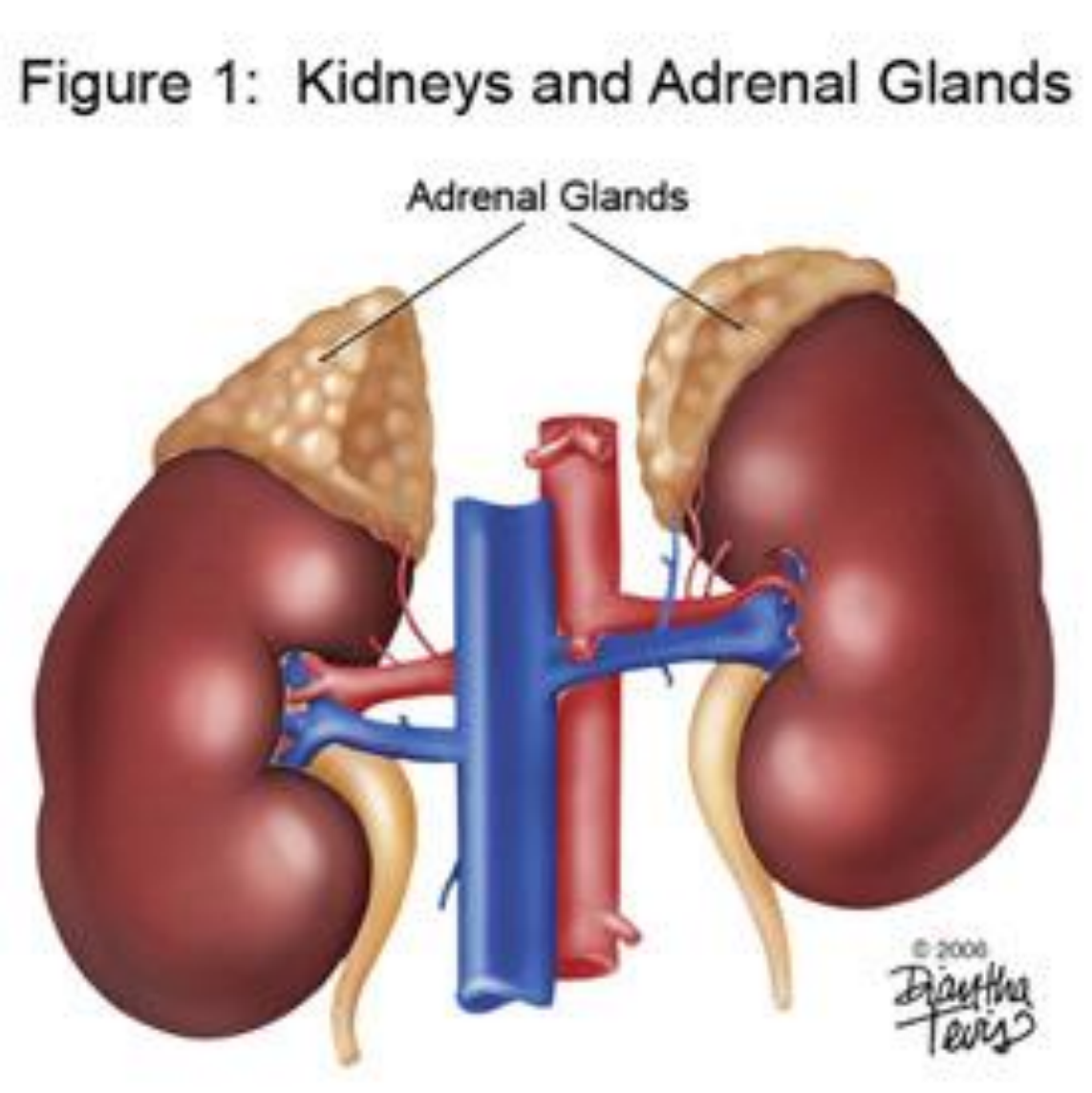
DHEA

- prevents blood clots
- increases bone growth
- promotes weight loss
- increases brain function
- increases lean body mass
- increases a sense of well-being
- helps with one deal with stress
- supports the immune system
- helps the body repair itself to maintain tissue
- decreased allergic reaction
- Lower triglycerides

Cortisol


Cholesterol
Pregnenolone
Progesterone
Hydroxypregnenolone
Dehydroepiandrosterone (DHEA)
Deoxycorticosterone
Hydroxyprogesterone
Androstendione
Corticosterone
Deoxycortisol
Estrone
Testosterone
Aldosterone
Cortisol
Estriol
Estradiol

Cortisol



Functions of cortisol

- balances blood sugar weight control,
- immune system response,
- bone turnover rate,
- stress reaction,
- sleep,
- mood and thoughts
- influences testosterone estrogen ratio,
- effects thyroid
- is an anti-inflammatory
- Chronic Fatigue

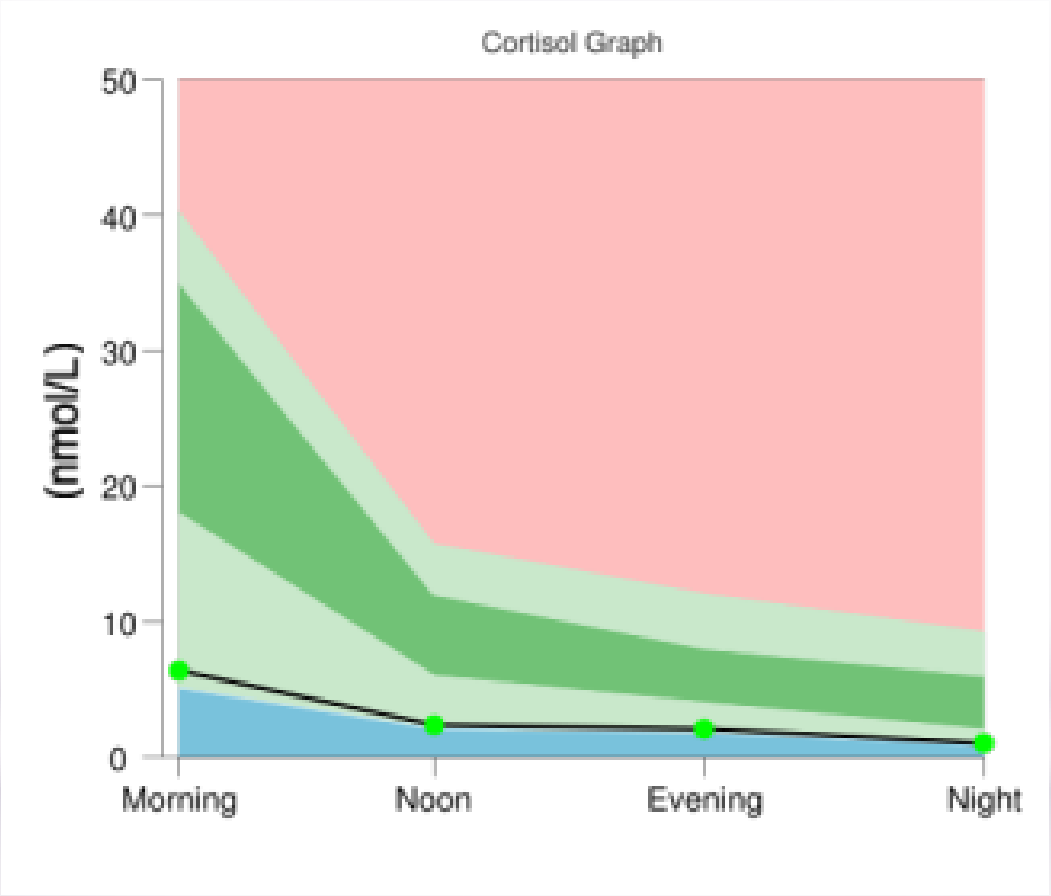
Abnormal cortisol

- levels are associated with

- menopause
- chronic fatigue syndrome,
- fibromyalgia
- depression
- insulin resistance diabetes
- generalized memory loss
- rheumatoid arthritis
- breast cancer

- IB,
- exacerbation of multiple sclerosis
- panic disorders
- PMS
- infertility
- sleep disorders
- osteoporosis,
- heart disease
- Alzheimer's disease
- coronary heart disease

Adrenal Fatigue



Part 5
cases

Case Study

ALL INDIVIDUALS

- Difficulty Concentrating
- Increased Forgetfulness
- Foggy Thinking
- Tearful
- Depressed
- Mood Swings
- Fluid Retention/Bloating
- Cold Extremities
- Stress
- Anxious
- Irritable
- Nervous
- Decreased Mental Sharpness
- Morning Fatigue
- Afternoon Fatigue
- Evening Fatigue
- Excessive Worry
- Difficulty Falling Asleep
- Difficulty Staying Asleep
- Decreased Stamina
- Diminished Motivation
- Fibromyalgia
- Ringing in Ears
- Allergies
- Headaches/Migraines
- Dizzy Spells
- Sugar Cravings
- Addictive Behavior
- Poor Impulse Control
- Obsessive Behavior (OCD)
- Craving Food, Alcohol, Tobacco, or Other
- Constipation
- Goiter
- Cold Body Temperature
- Hoarseness
- Hair Dry or Brittle
- Nails Breaking or Brittle
- Slow Pulse Rate
- Rapid Heartbeat
- Heart Fluttering/Palpitations
- Incontinence
- Hot Flashes
- Night Sweats
- Infertility Problems
- Acne
- Scalp Hair Loss
- Weight Gain-Hips
- Weight Gain-Waist
- High Cholesterol
- Elevated Triglycerides
- Decreased Libido
- Decreased Muscle Size
- Decreased Flexibility
- Burned Out Feeling
- Sore Muscles
- Increased Joint Pain
- Neck or Back Pain
- Bone Loss
- Thinning Skin
- Rapid Aging
- Aches and Pains
- IBS

Height (inches) 59"
Weight (lbs) 106

☒ Personal/Family History of: Breast, Uterine, or Ovarian Cancer

WOMEN ONLY

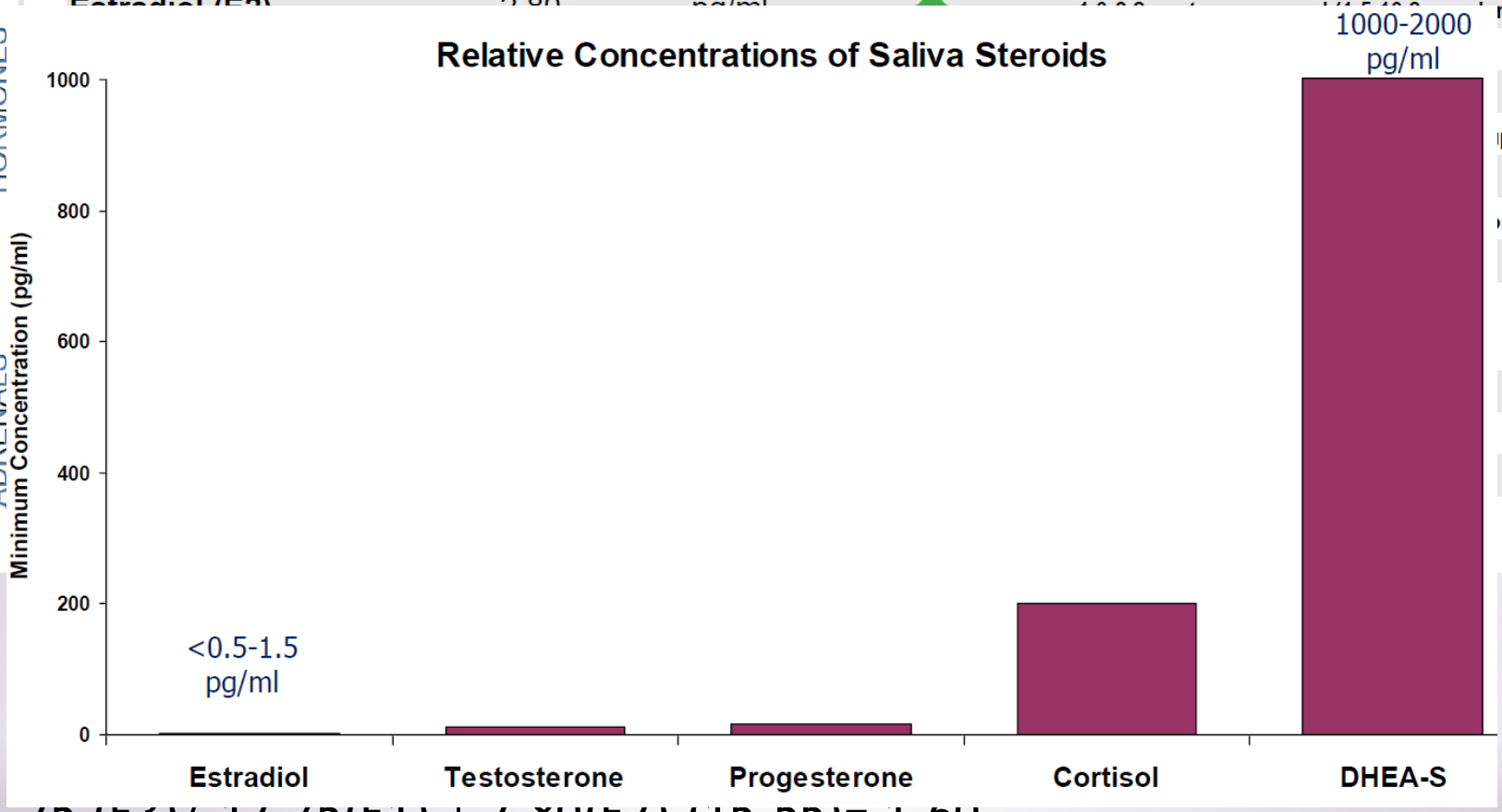
- Vaginal Dryness
- Irregular Periods
- Uterine Fibroids
- Tender Breasts
- Fibrocystic Breasts
- Increased Facial/Body Hair

Last Menses 1 / 12000 ?

MEN ONLY

- Decreased Urine Flow
- Increased Urinary Urge
- Prostate Problems
- Decreased Erections

Saliva Hormone Test	Result	Units	L	WR	H	Reference Range
Estrone (E1)	12.75	pg/ml		◆		<47.0 post menopausal



25 (E3)/ 12.75(E1) + 2.80(E2) (15.55)= 1.60

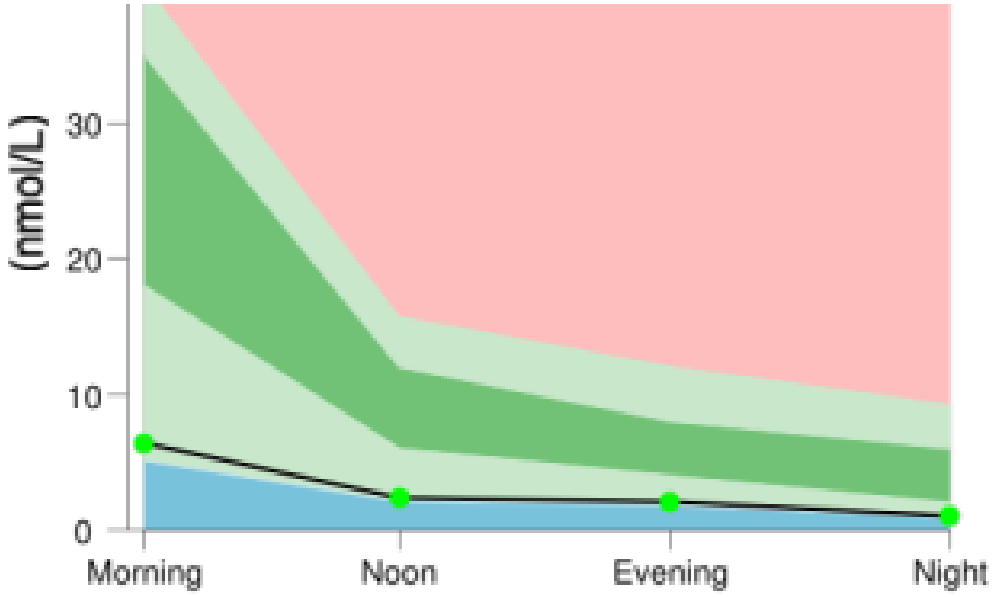
Progesterone to Estrogen ratio:

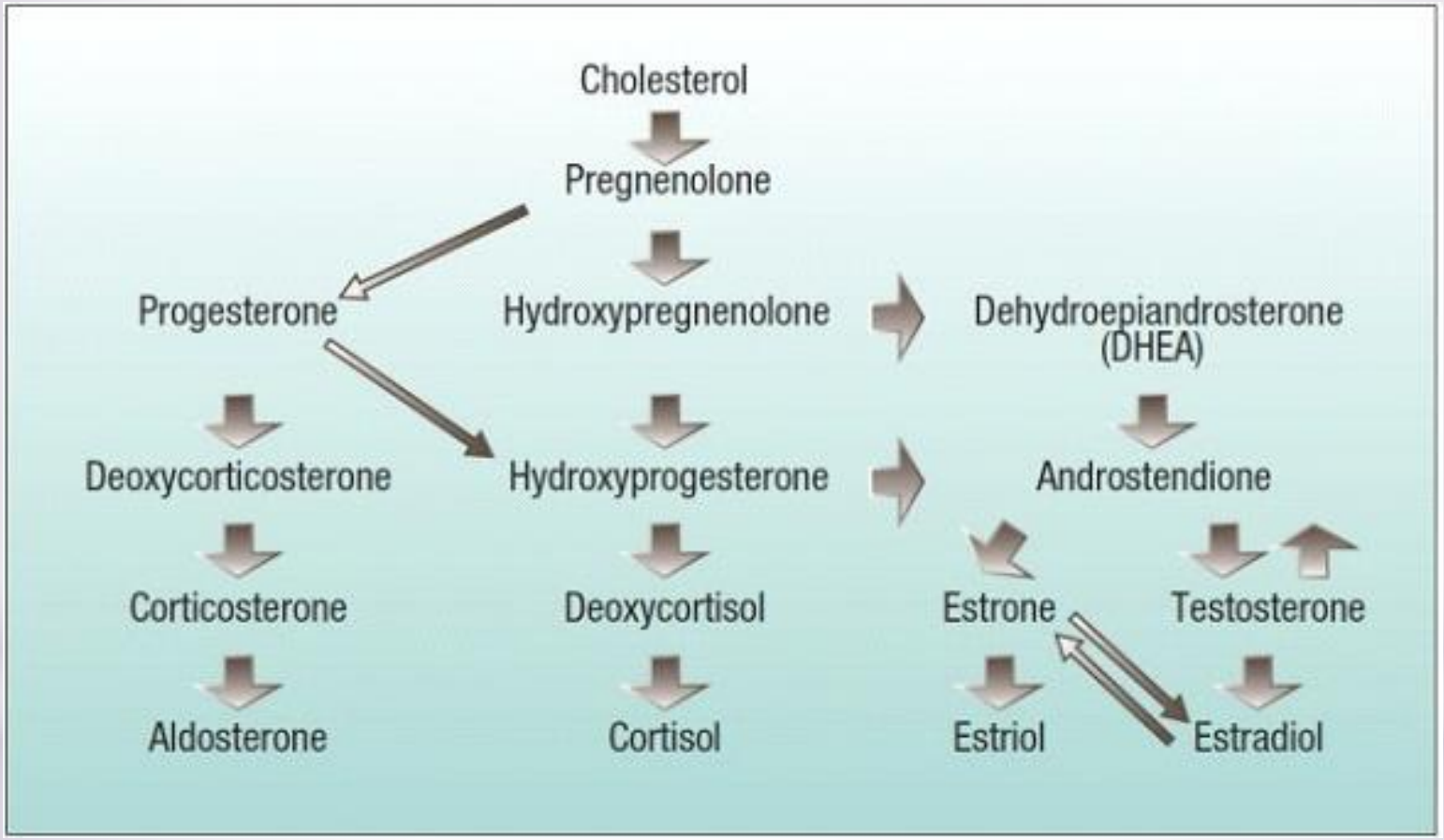
21.94 (progesterone) / 2.80(E2)= 7.83

FOR EVERY 1 estrogen we have 7.32 progesterone

800 (progesterone) / 2.80(E2)= 285

	Saliva Hormone Test	Result	Units	L	WR	H	Reference Range
HORMONES	Estrone (E1)	12.75	pg/ml		◆		<47.0 post menopausal
	Estradiol (E2)	2.80	pg/ml		◆		1.0-3.2 post menopausal (1.5-10.8 supplementation)
	Estriol (E3)	< 5.00	pg/ml		◆		<66.0 (67.0-708.0 supplementation)
	EQ (E3 / (E1 + E2))	0.32		↓			low <1.0; WR >=1.0; optimal >1.5
	Progesterone (Pg)	21.94	pg/ml		◆		18.0-126.0 post menopausal (500-3000 supplementation)
	Ratio of Pg/E2	7.83		↓			200-600 pre; post with supplementation
	Testosterone	66.22	pg/ml			↑	6.1-49.0 female (30.0-60.0 supplementation)
	DHT		pg/ml				
ADRENALS	DHEA	336.84	pg/ml			↑	106.0-300.0 female
	Cortisol Morning	12.38	nmol/L		◆		5.1-40.2; optimal range: 18-35*
	Cortisol Noon	2.20	nmol/L		◆		2.1-15.7; optimal range: 6-12*
	Cortisol Evening	1.55	nmol/L	↓			1.8-12; optimal range: 4-8*
	Cortisol Night	1.06	nmol/L		◆		0.9-9.2; optimal range: 2-6*




Cholesterol
Pregnenolone
Progesterone
Hydroxypregnenolone
Dehydroepiandrosterone (DHEA)
Deoxycorticosterone
Hydroxyprogesterone
Androstendione
Corticosterone
Deoxycortisol
Estrone
Testosterone
Aldosterone
Cortisol
Estriol
Estradiol

Senior Markers

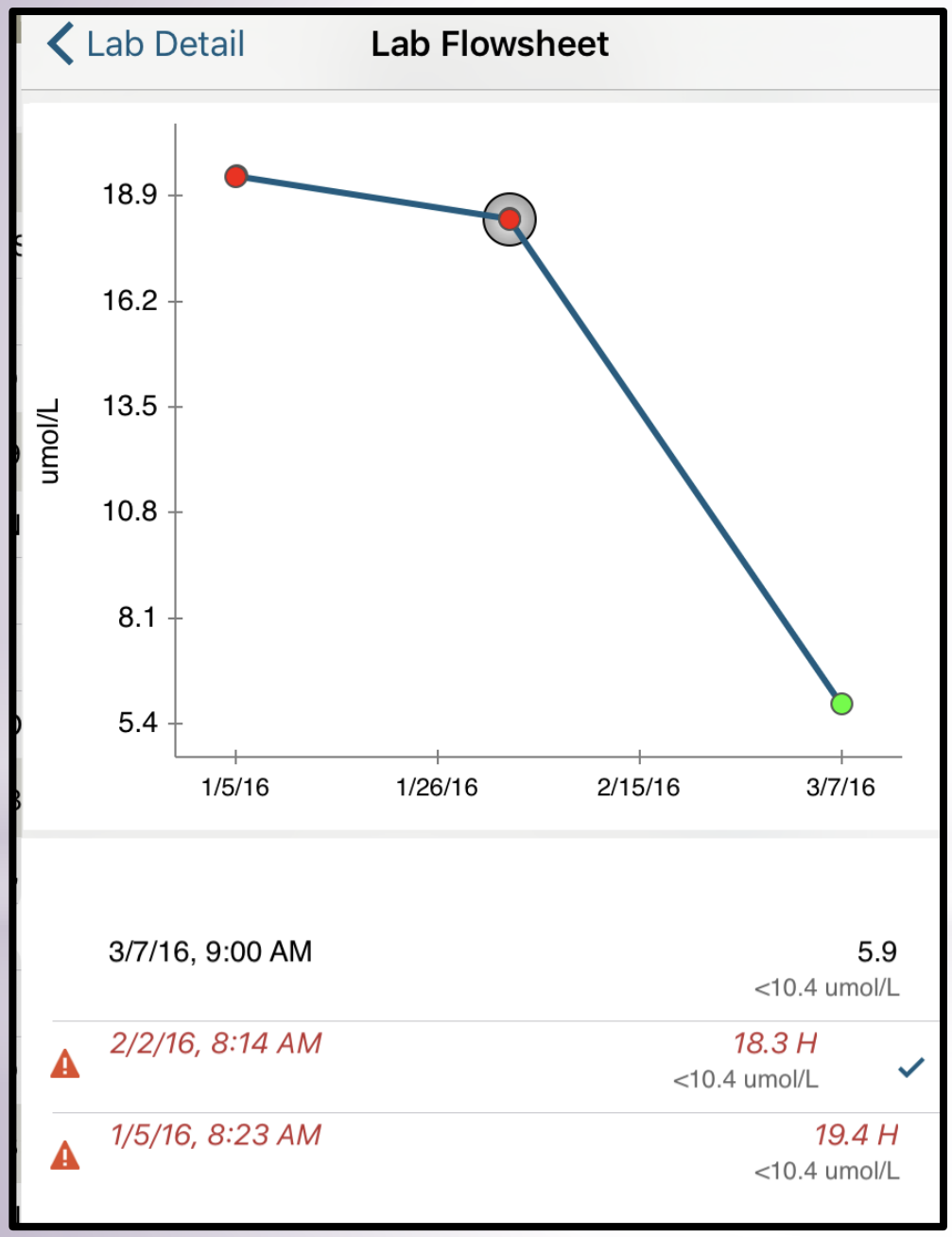
- Fasting Insulin
- Fasting Glucose
- A1c
- Homocysteine
- Vitamin D

HOMOCYSTEINE	**12.2 H**	<10.4 umol/L

Homocysteine is increased by functional deficiency of folate or vitamin B12. Testing for methylmalonic acid differentiates between these deficiencies. Other causes of increased homocysteine include renal failure, folate antagonists such as methotrexate and phenytoin, and exposure to nitrous oxide.

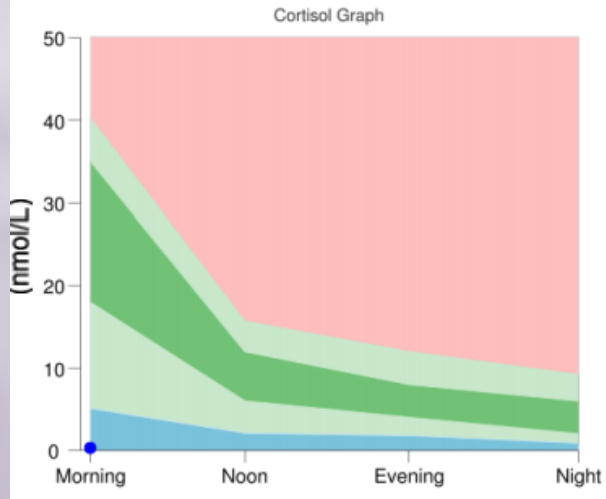
PREGNENOLONE, LC/MS/MS	**<5 L**	ng/dL

Homocysteine



60 year old female with server RA and Lupus

	Saliva Hormone Test	Result	Units	L	WR	H	Reference Range
HORMONES	Estrone (E1)		pg/ml				
	Estradiol (E2)	1.43	pg/ml		◆		1.0-3.2 post menopausal (1.5-10.8 supplementation)
	Estriol (E3)	< 5.00	pg/ml		◆		<66.0 (67.0-708.0 supplementation)
	EQ (E3 / (E1 + E2))						
	Progesterone (Pg)	< 10.00	pg/ml	↓			18.0-126.0 post menopausal (500-3000 supplementation)
	Ratio of Pg/E2	6.97		↓			200-600 pre; post with supplementation
	Testosterone	8.30	pg/ml		◆		6.1-49.0 female (30.0-60.0 supplementation)
	DHT		pg/ml				
ADRENALS	DHEA	217.72	pg/ml		◆		106.0-300.0 female
	Cortisol Morning	0.37	nmol/L	↓			5.1-40.2; optimal range: 18-35*
	Cortisol Noon		nmol/L				
	Cortisol Evening		nmol/L				
	Cortisol Night		nmol/L				

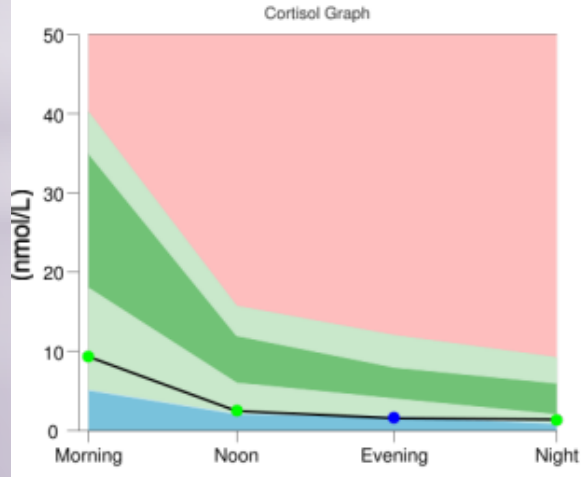


Hormone Interpretations:

- Low range estradiol level is consistent with reported deficiency symptoms. Supplementation may be warranted. Estriol level is consistent with reported vaginal dryness. Supplementation with transvaginal (suppository or cream) estriol may be warranted. The Estrogen Quotient (EQ) cannot be assessed without an estrone level.
- Progesterone to estradiol (Pg/E2) ratio is consistent with estrogen dominance. Progesterone supplementation is recommended to reduce risk of breast cancer, dementia, cardiovascular disease and osteoporosis.
- Suboptimal testosterone may relate to increased risk of osteoporosis, low libido, vaginal dryness and heart disease.
- The low AM cortisol level and reported symptoms are suggestive of adrenal gland dysfunction (hypoadrenia). The current samples will be held 25 days from receipt for additional testing.

Case 2 M.J. 58 female

	Saliva Hormone Test	Result	Units	L	WR	H	Reference Range
HORMONES	Estrone (E1)	30.92	pg/ml		◆		<47.0 post menopausal
	Estradiol (E2)	2.52	pg/ml		◆		1.0-3.2 post menopausal (1.5-10.8 supplementation)
	Estriol (E3)	15.33	pg/ml		◆		<66.0 (67.0-708.0 supplementation)
	EQ (E3 / (E1 + E2))	0.46		↓			low <1.0; WR >=1.0; optimal >1.5
	Progesterone (Pg)	< 10.00	pg/ml	↓			18.0-126.0 post menopausal (500-3000 supplementation)
	Ratio of Pg/E2	3.97		↓			200-600 pre; post with supplementation
	Testosterone	46.21	pg/ml		◆		6.1-49.0 female (30.0-60.0 supplementation)
	DHT		pg/ml				
ADRENALS	DHEA	14.23	pg/ml	↓			106.0-300.0 female
	Cortisol Morning	9.33	nmol/L		◆		5.1-40.2; optimal range: 18-35*
	Cortisol Noon	2.46	nmol/L		◆		2.1-15.7; optimal range: 6-12*
	Cortisol Evening	1.56	nmol/L	↓			1.8-12; optimal range: 4-8*
	Cortisol Night	1.40	nmol/L		◆		0.9-9.2; optimal range: 2-6*



Hormone Interpretations:

- Estrone, estradiol and estriol are within the reference ranges, however the Estrogen Quotient (EQ) is low. Estriol is less potent than the other estrogens and when present in sufficient quantities (as indicated by an optimal EQ) it plays an antagonistic role, and may govern the proliferative effects of estrone and estradiol. Estriol supplementation is a consideration to balance this quotient and reduce associated risks.
- Progesterone to estradiol (Pg/E2) ratio and reported symptoms are consistent with estrogen dominance. Supplementation with topical progesterone to correct this relative deficiency is a consideration.
- The upper range testosterone level and reported symptoms are suggestive of metabolic syndrome (insulin resistance). Serum vitamin D, fasting glucose and insulin testing may be warranted.
- While DHEA levels are expected to decline with age (adrenopause), the DHEA level measured here is below the age related decline. Note: Supplementation with DHEA may increase testosterone and/or estradiol levels.
- Diurnal cortisol pattern and reported symptoms are consistent with evolving (Phase 2) adrenal gland dysfunction (hypoadrenia), although concomitant thyroid and/or iodine insufficiency cannot be ruled out.

	Saliva Hormone Test	Result	Units	L	WR	H	Reference Range
HORMONES	Estrone (E1)	94.94	pg/ml			↑	5.8-34.2 post menopausal
	Estradiol (E2)	2.87	pg/ml		◆		1.0-3.2 post menopausal (1.5-10.8 supplementation)
	Estriol (E3)	48.75	pg/ml		◆		<66.0 (67.0-708.0 supplementation)
	EQ (E3 / (E1 + E2))	0.50		↓			low <1.0; WR >1.0; optimal >1.5
	Progesterone (Pg)	> 24300.00	pg/ml			↑	500-3000 supplementation
	Ratio of Pg/E2	8466.90				↑	200-600 post menopausal (Pg supplementation)**
	Testosterone	58.00	pg/ml			↑	6.1-49.0 female (30.0-60.0 supplementation)
	DHT		pg/ml				
ADRENALS	DHEA	164.49	pg/ml		◆		106.0-300.0 female
	Cortisol Morning	6.49	nmol/L		◆		5.1-40.2; optimal range: 18-35*
	Cortisol Noon	2.46	nmol/L		◆		2.1-15.7; optimal range: 6-12*
	Cortisol Evening	1.32	nmol/L	↓			1.8-12; optimal range: 4-8*
	Cortisol Night	1.34	nmol/L		◆		0.9-9.2; optimal range: 2-6*