# 신경학적인 문제와 관련된 AK의 치료

# Muscle testing= Functional neurology

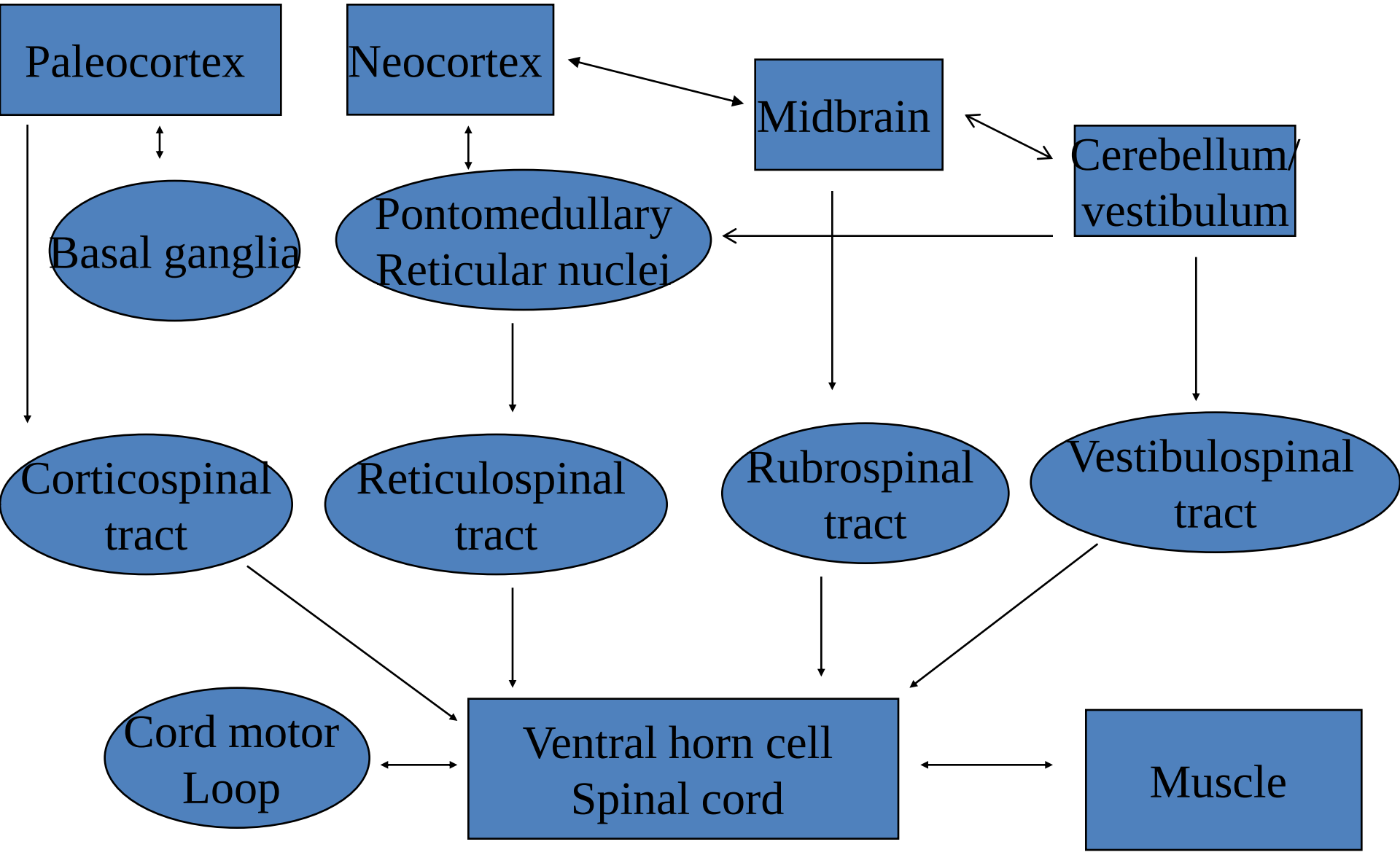
- Dr. Schmitt
- 근육은 신경계(말초신경-중추신경)와 연결되어 있고(afferent, efferent system으로) 신경계의 활동에 따라서 근육의 긴장도가 바뀌어진다.
- Brain, cerebral cortex, neocortex
- 의식, 무의식

# 신경학적 개념의 근육검사

- 근육검사는 일종의 신경학적인 반사이며 역동적으로 변하는 뇌의 상태를 시시각각 다양한 상태에서 알려주는 도구다.
- 일반 의학적인 검사에 나타나지 않는 부분들 특히 숨겨진 문제나 잠재적인 문제 그리고 근본적인 이상(underlying basic cause)을 찾아내데 도움이 된다.

# 근육의 반응으로 신경계의 기능이상을 알아보는 법

- 근육은 운동신경의 지배를 받는다.
- Corticospinal, reticulospinal, rubrospinal, tectospinal, vestibulospinal, MLF(medial longitudinal fasciculus) 등
- 동공반사, 표정근, palate elevation…
- Posture & balance
- 근육검사

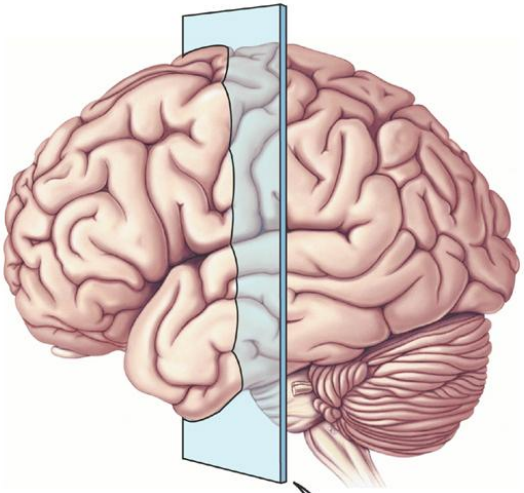

Paleocortex
Neocortex
Midbrain
Cerebellum/
vestibulum
Basal ganglia
Pontomedullary
Reticular nuclei
Corticospinal
tract
Reticulospinal
tract
Rubrospinal
tract
Vestibulospinal
tract
Cord motor
Loop
Ventral horn cell
Spinal cord
Muscle

# AK에서 신경학적인 접근

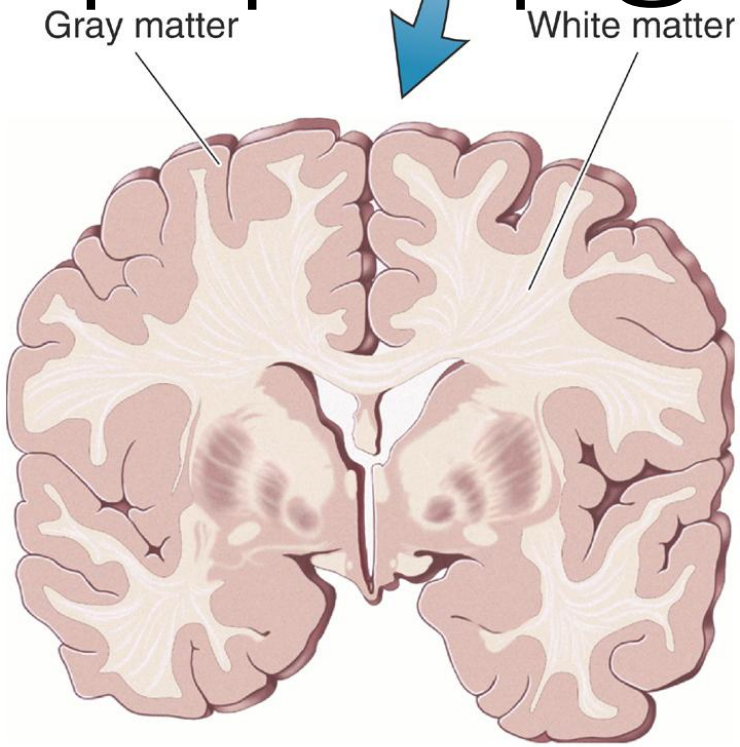
- 모든 근육검사는 신경계의 반응이다.
- 신경계는 말초, 중추신경을 포함해서 하나의 unit로 작용한다.
- 모든 근육은 신경계와 연결된다.
- 근육의 on & off는 신경계의 역동적인 변화를 대변한다.

# AK에서 신경학적인 접근

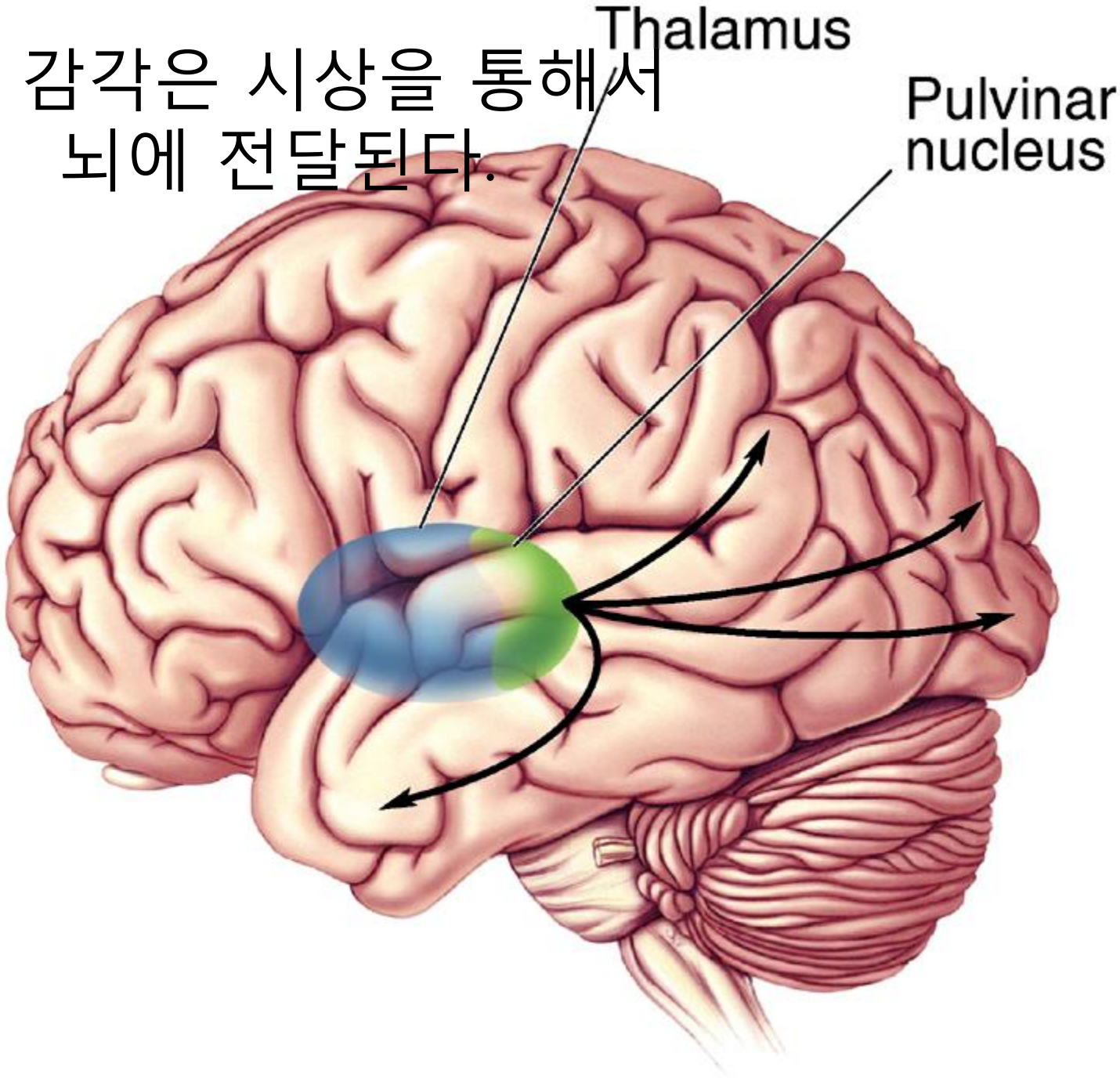
- History
- 신경학적인 검사(neurological examination)
- TBM의 circulation을 응용해서 localization 하고 신경학적인 검사와 일치하는지 확인



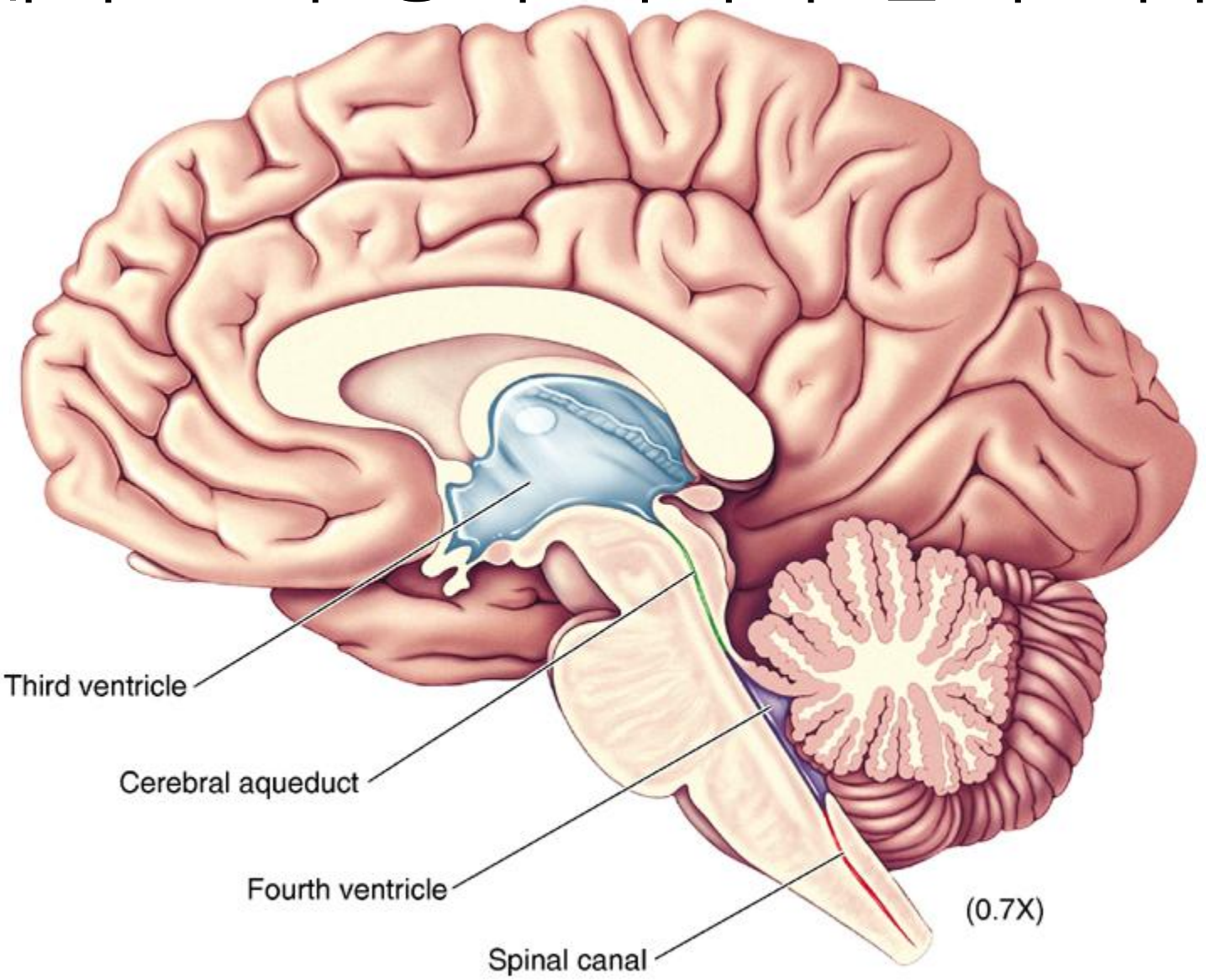
# 뇌의 구조와 생리



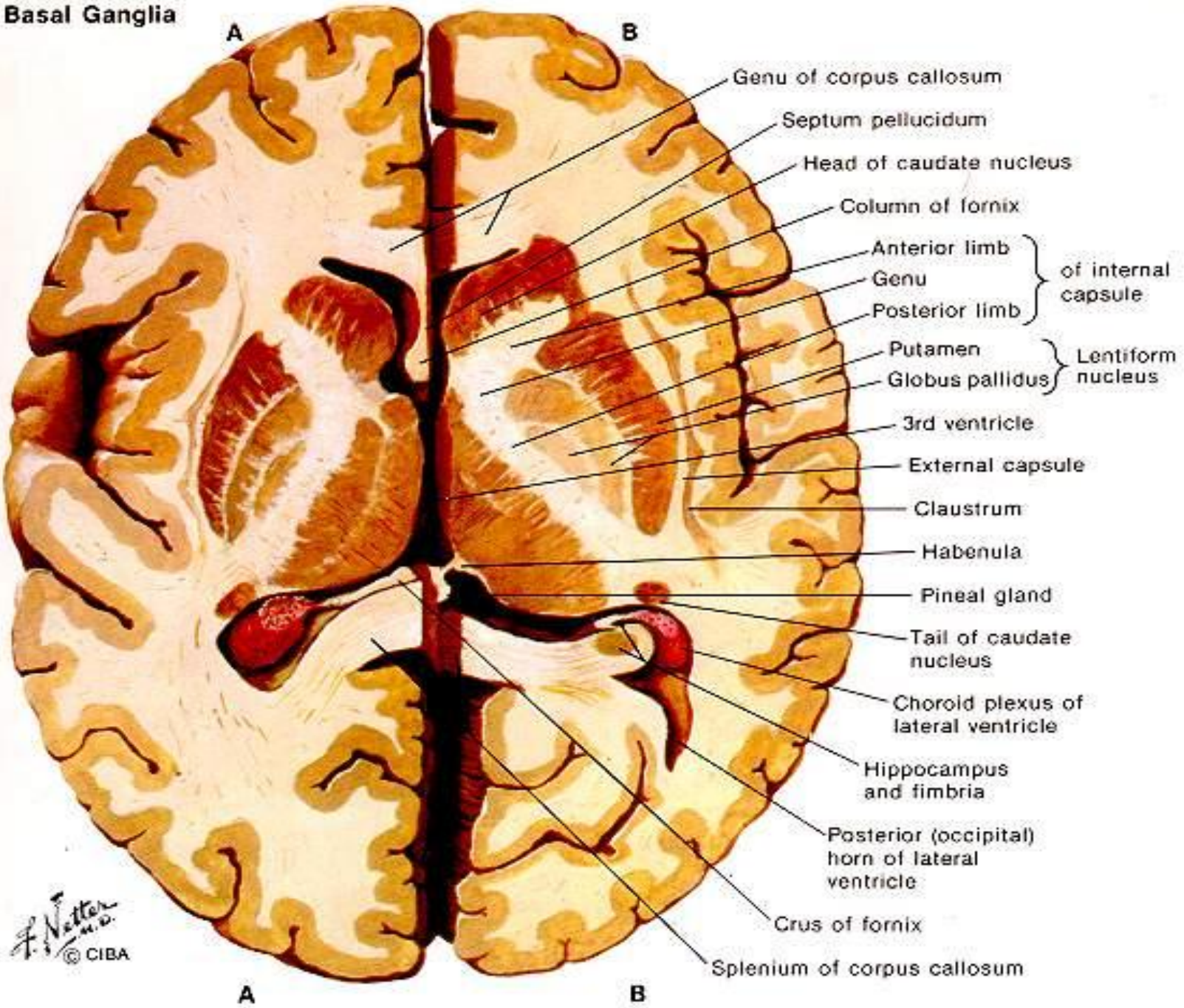
모든 감각은 시상을 통해서
뇌에 전달된다.

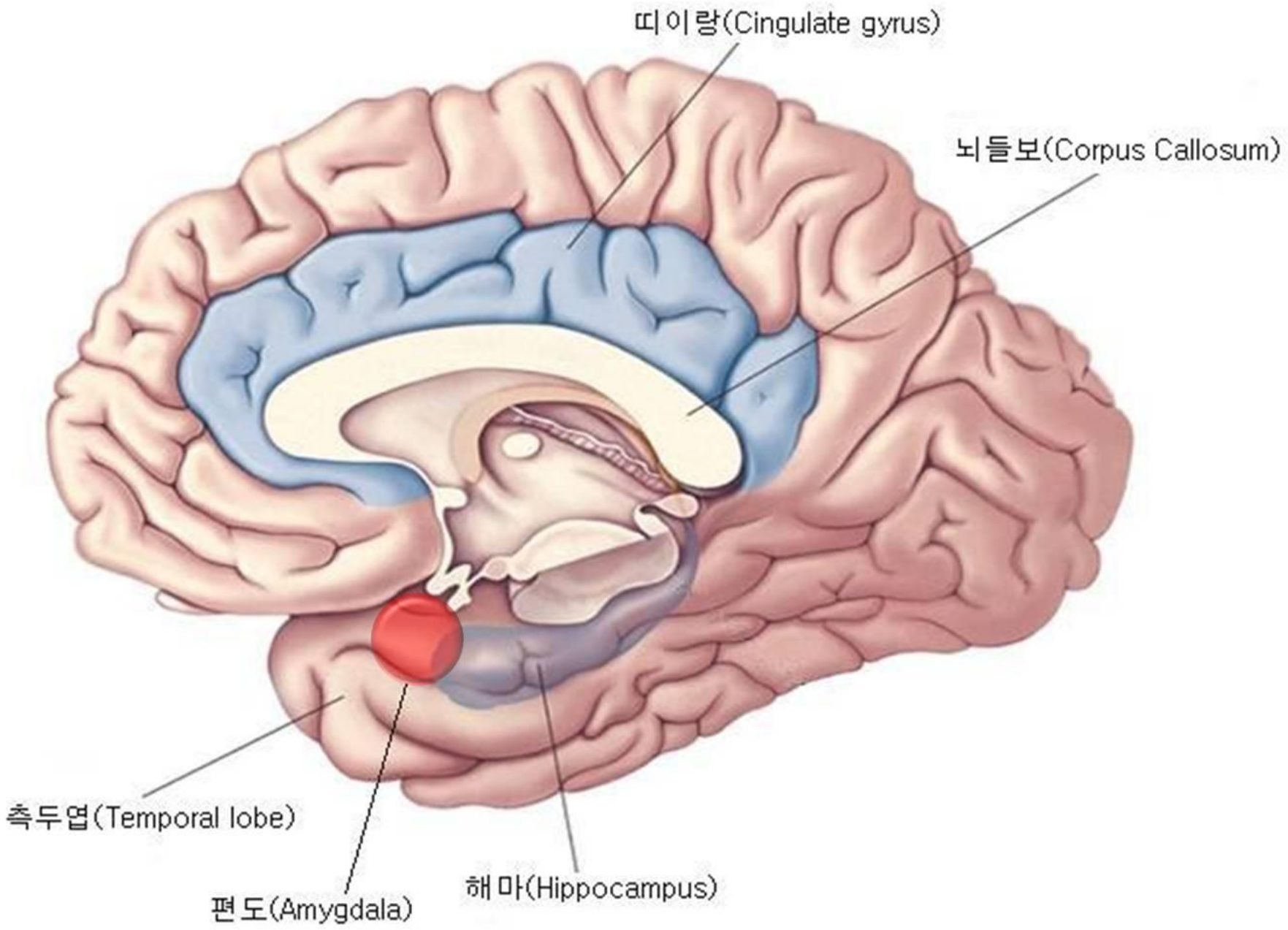


# 대뇌, 소뇌, 중뇌, 다리뇌, 숨뇌, 척수

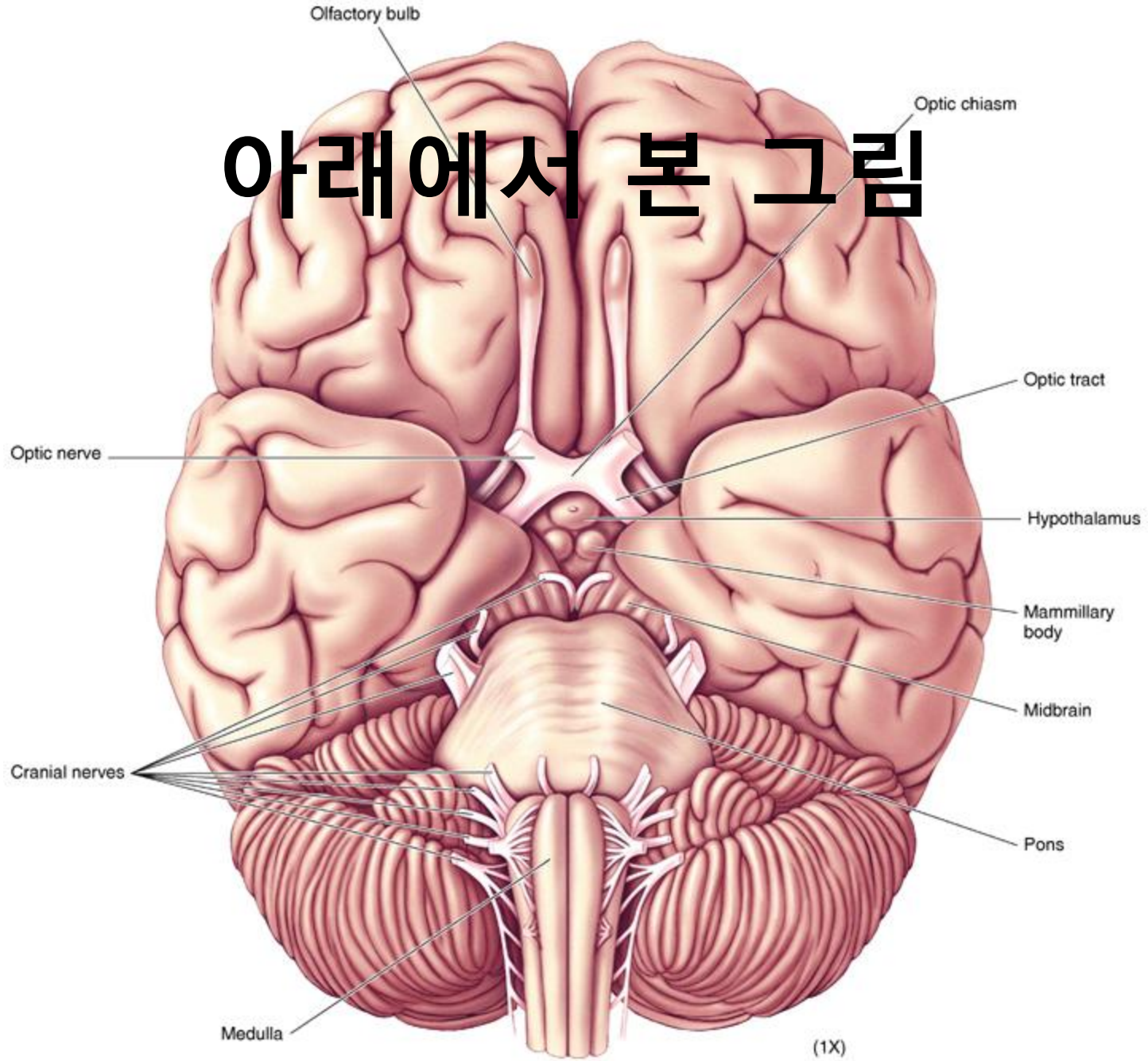


# Basal Ganglia

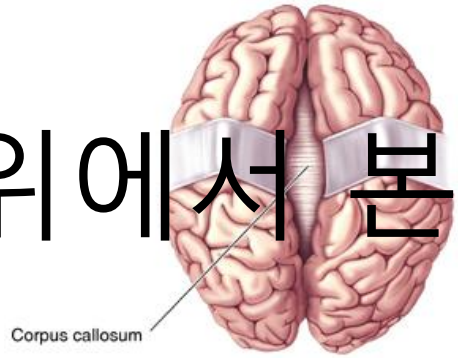


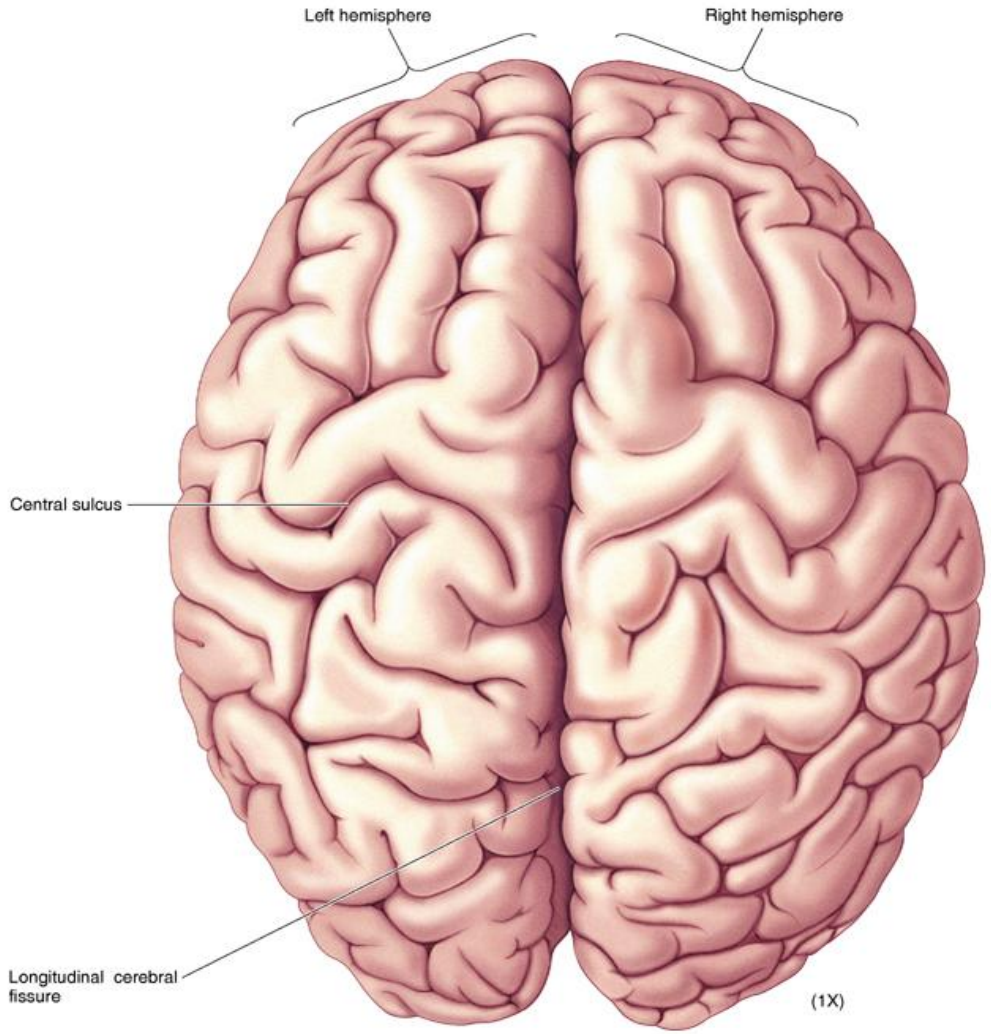

띠이랑(Cingulate gyrus)
뇌들보(Corpus Callosum)
측두엽(Temporal lobe)
편도(Amygdala)
해마(Hippocampus)

# 아래에서 본 그림



# 위에서 본 그림, 좌 우 뇌

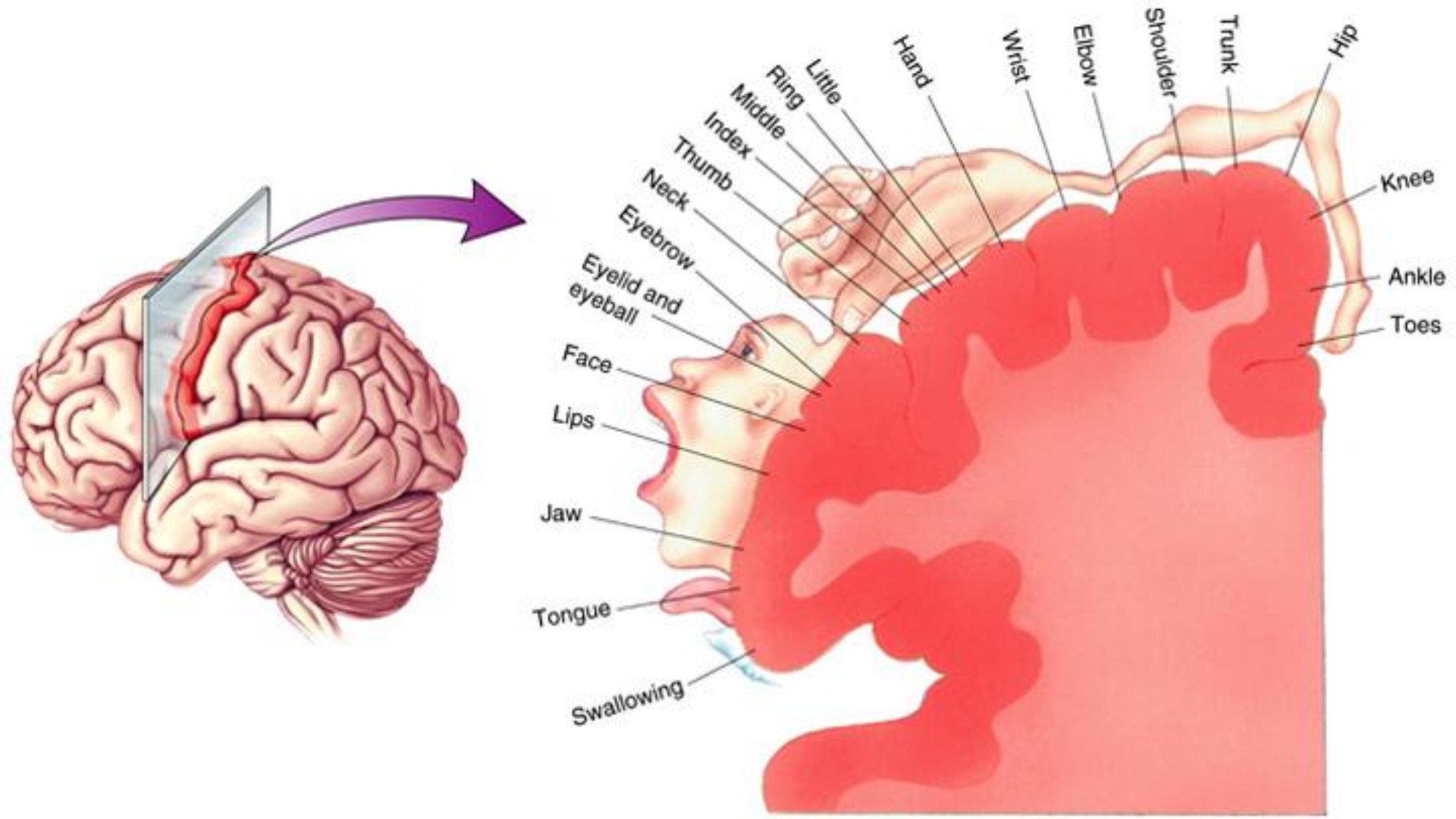


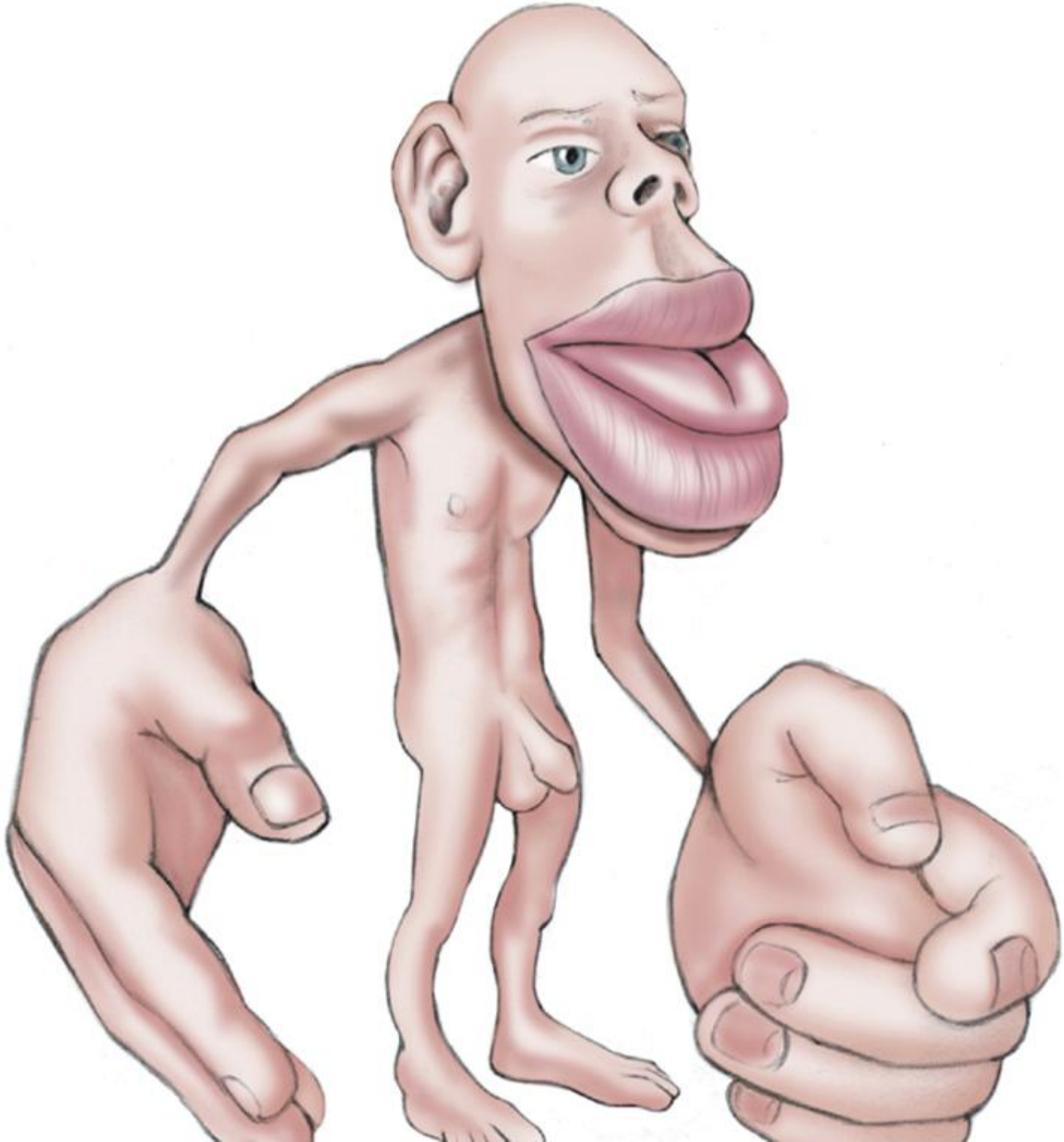



# Decreased Hemisphericity 진단

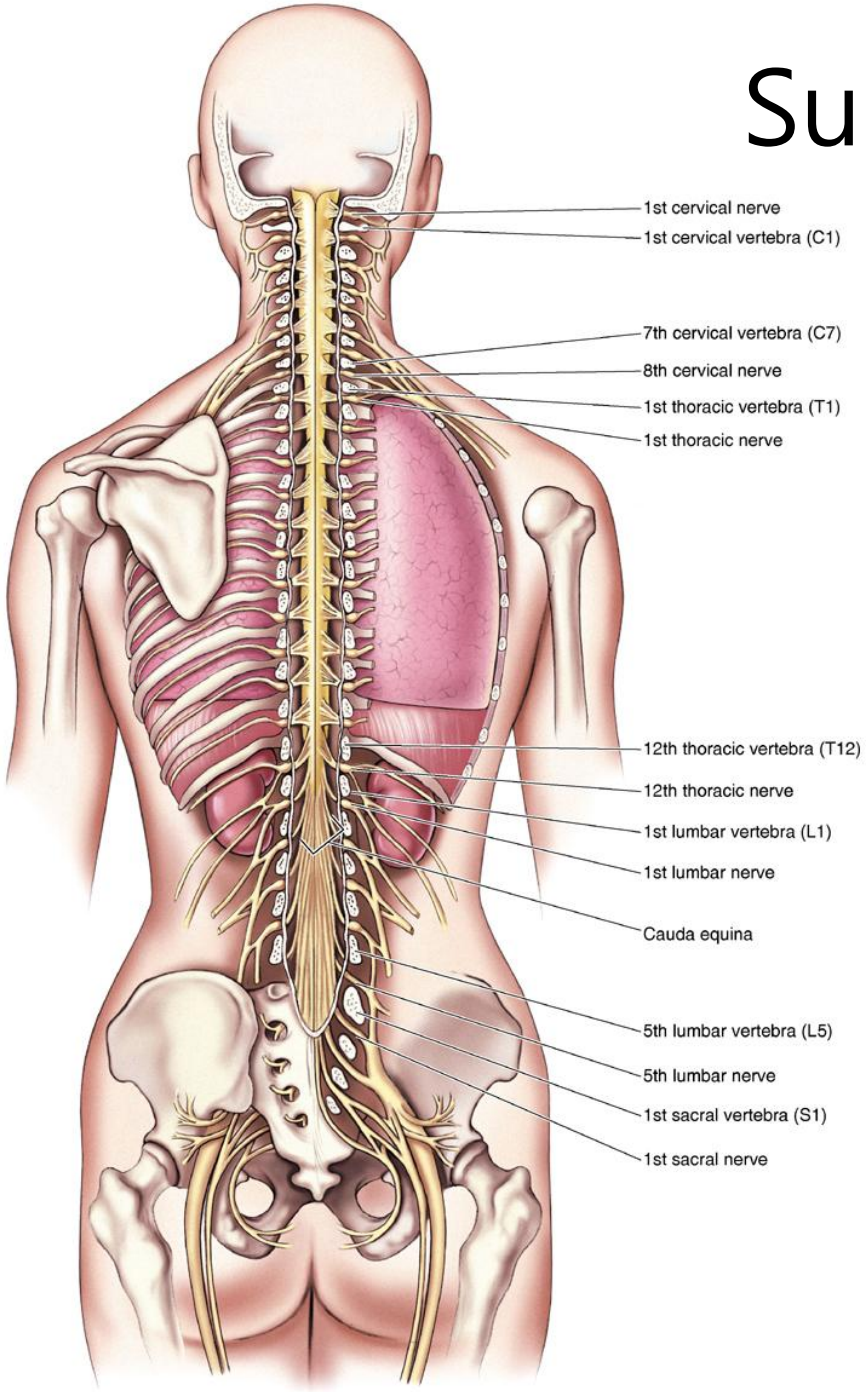
- Neurological approach
- Modified TBM
- Neurolink

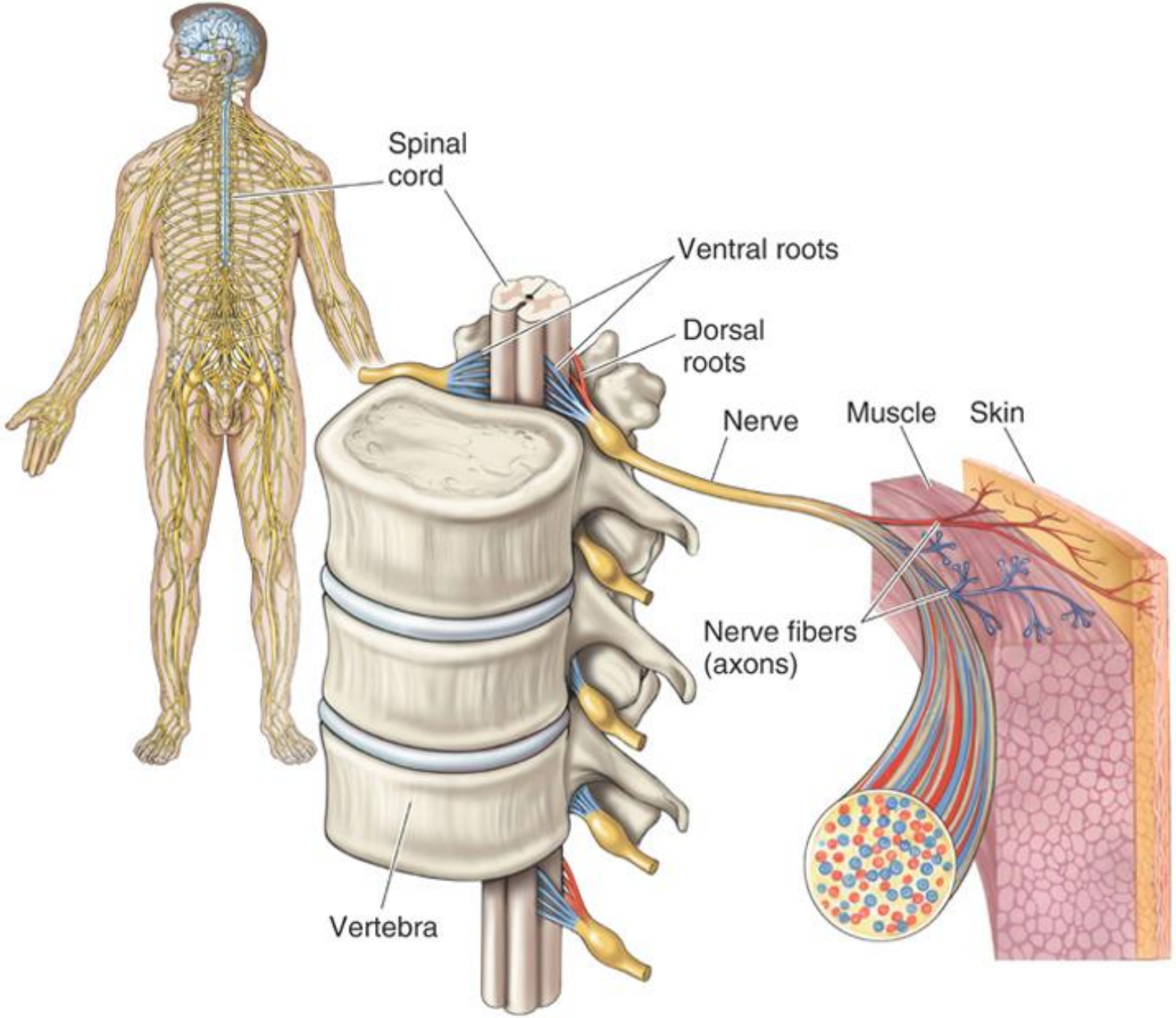
# 인체의 부위를 담당하는 뇌의 영역 homonculus

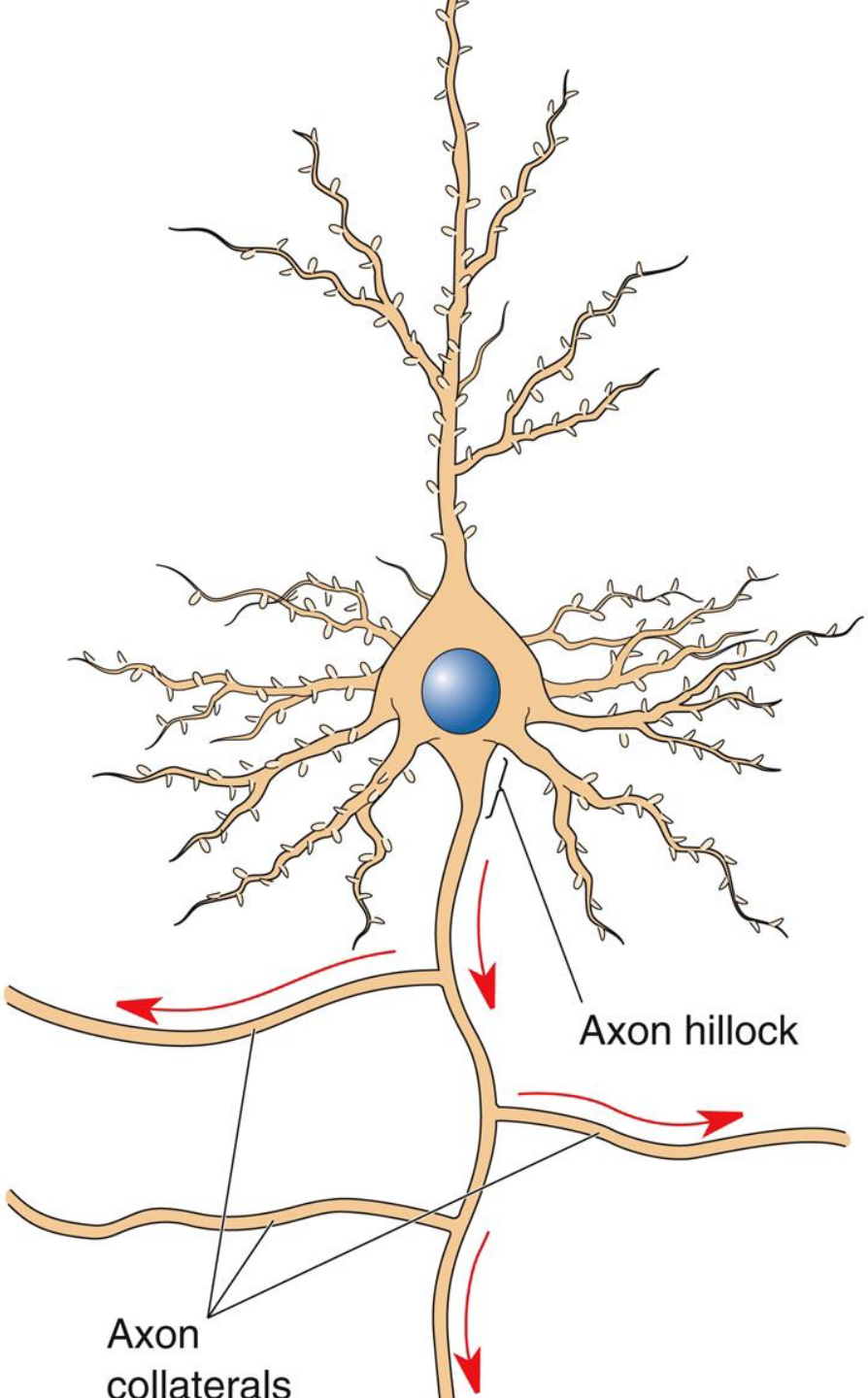




# Subluxation



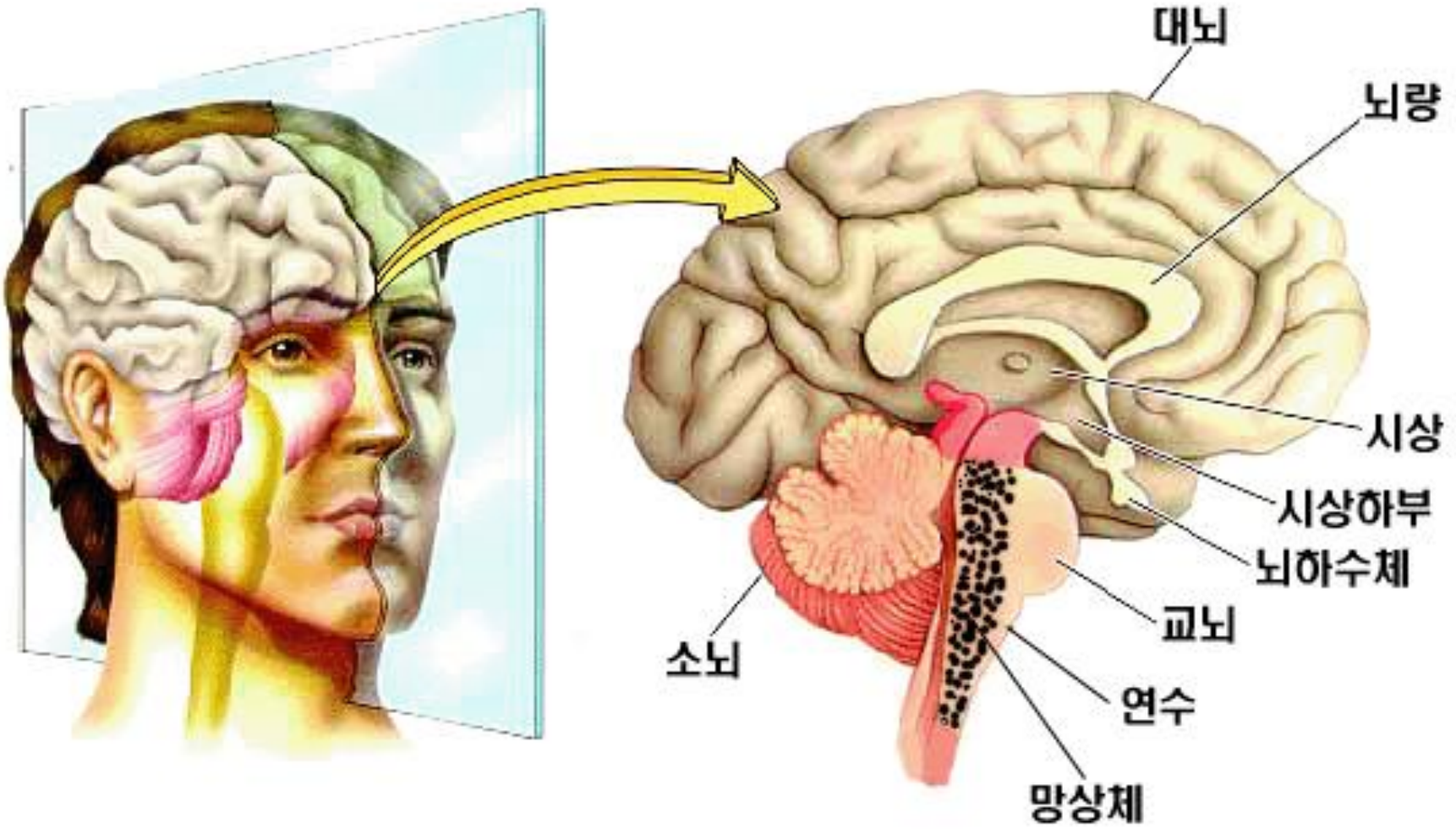



Axon hillock
Axon
collaterals

# 오장육부는
# 자율신경에 의해서 조절

자율신경은 뇌에서 조절

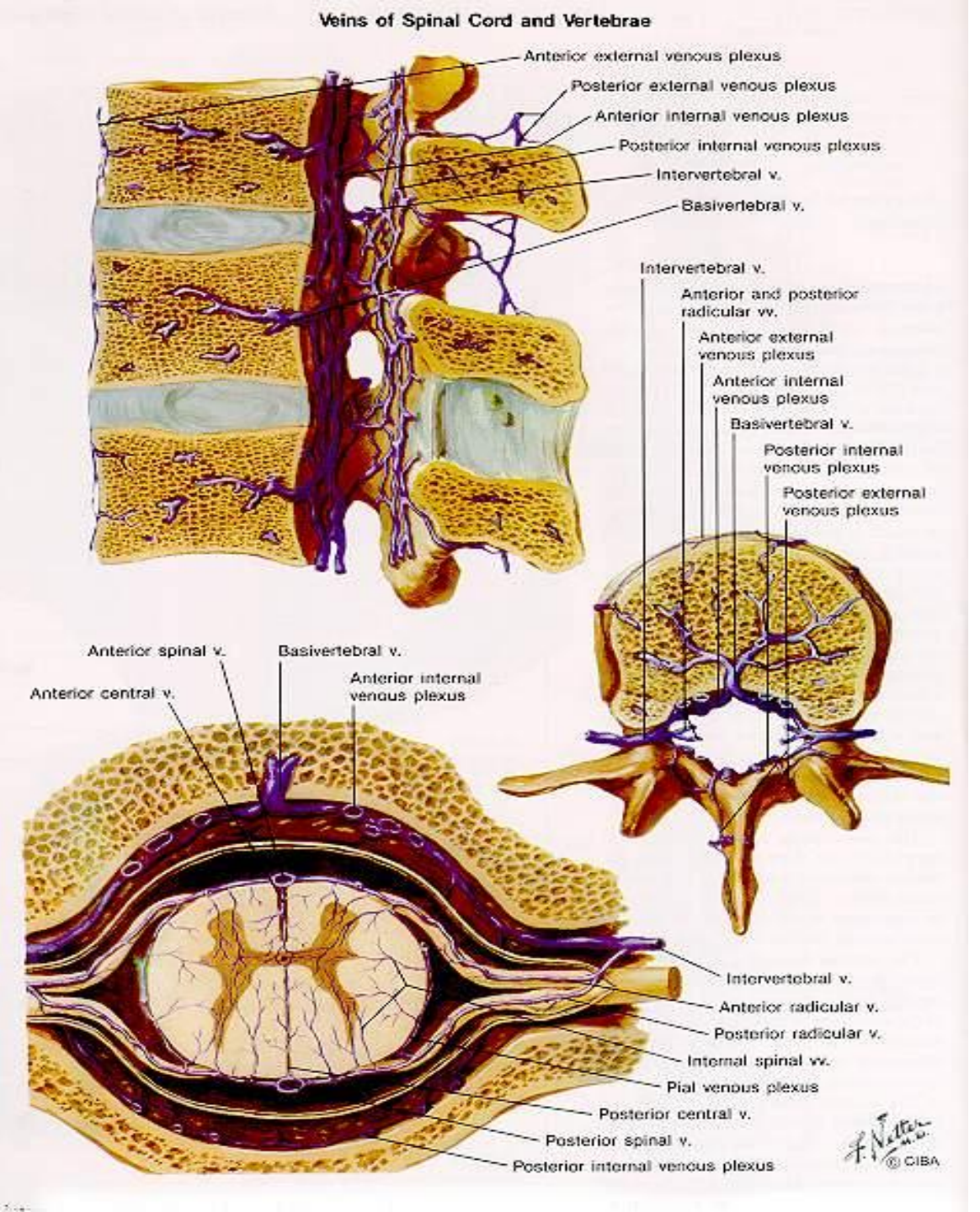
# 뇌에 의한 자율신경의 조절



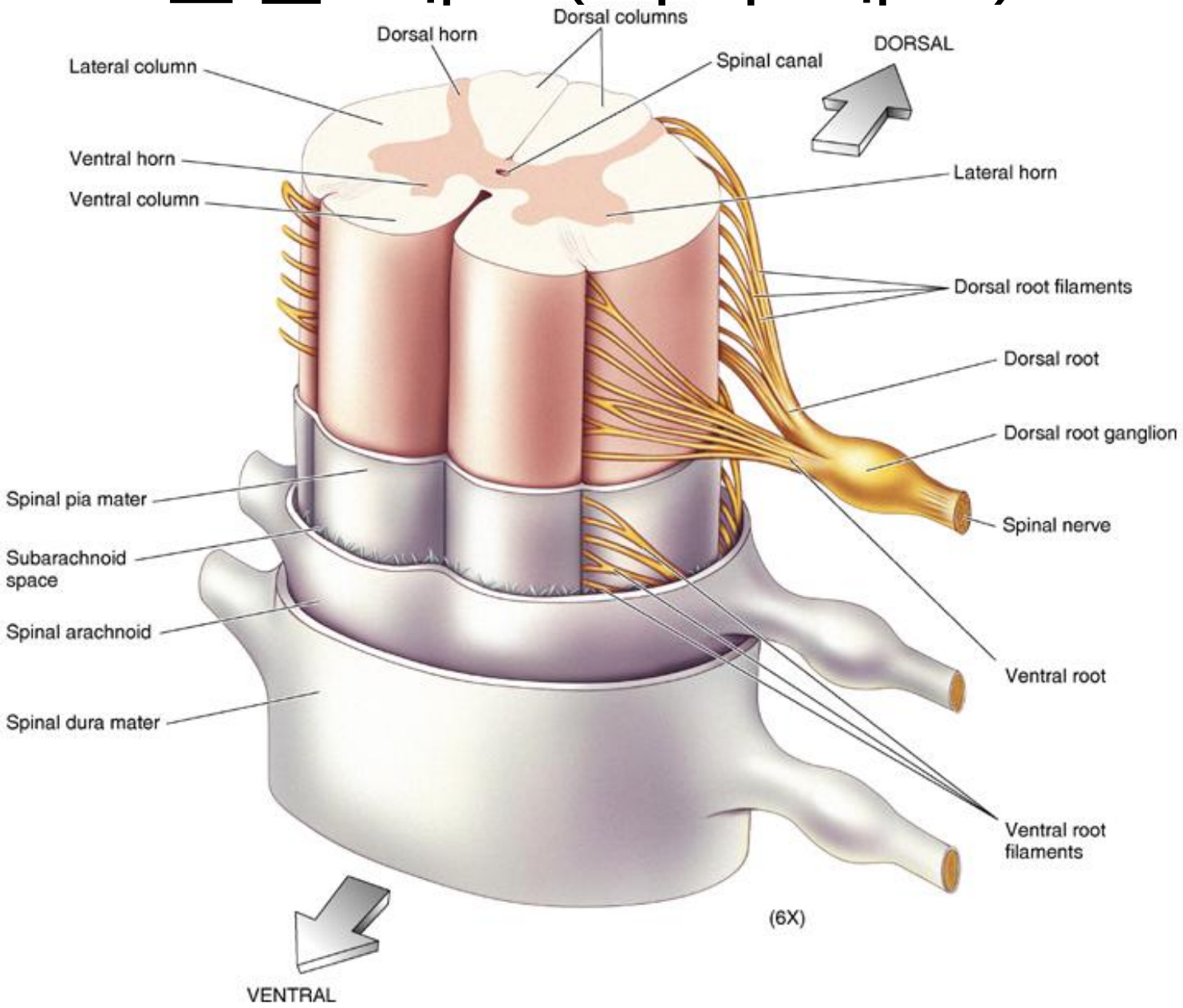
# 뇌와 자율신경

- 변연계(가장자리계통, limbic system)-감정뇌(emotional brain)
- 그물체(망상체, reticular formation)
- 시상하부(hypothalamus)
- 척수의 옆뿔세포(lateral horn, intermedilateral cell column): 교감신경이 시작하는 첫 신경세포
- 고립로핵(nucleus tractus solitarius, NTS), 그물체, 엉치신경의 부교감신경: 부교감신경이 시작하는 신경세포

# 척수 내의 엽뿔 세포

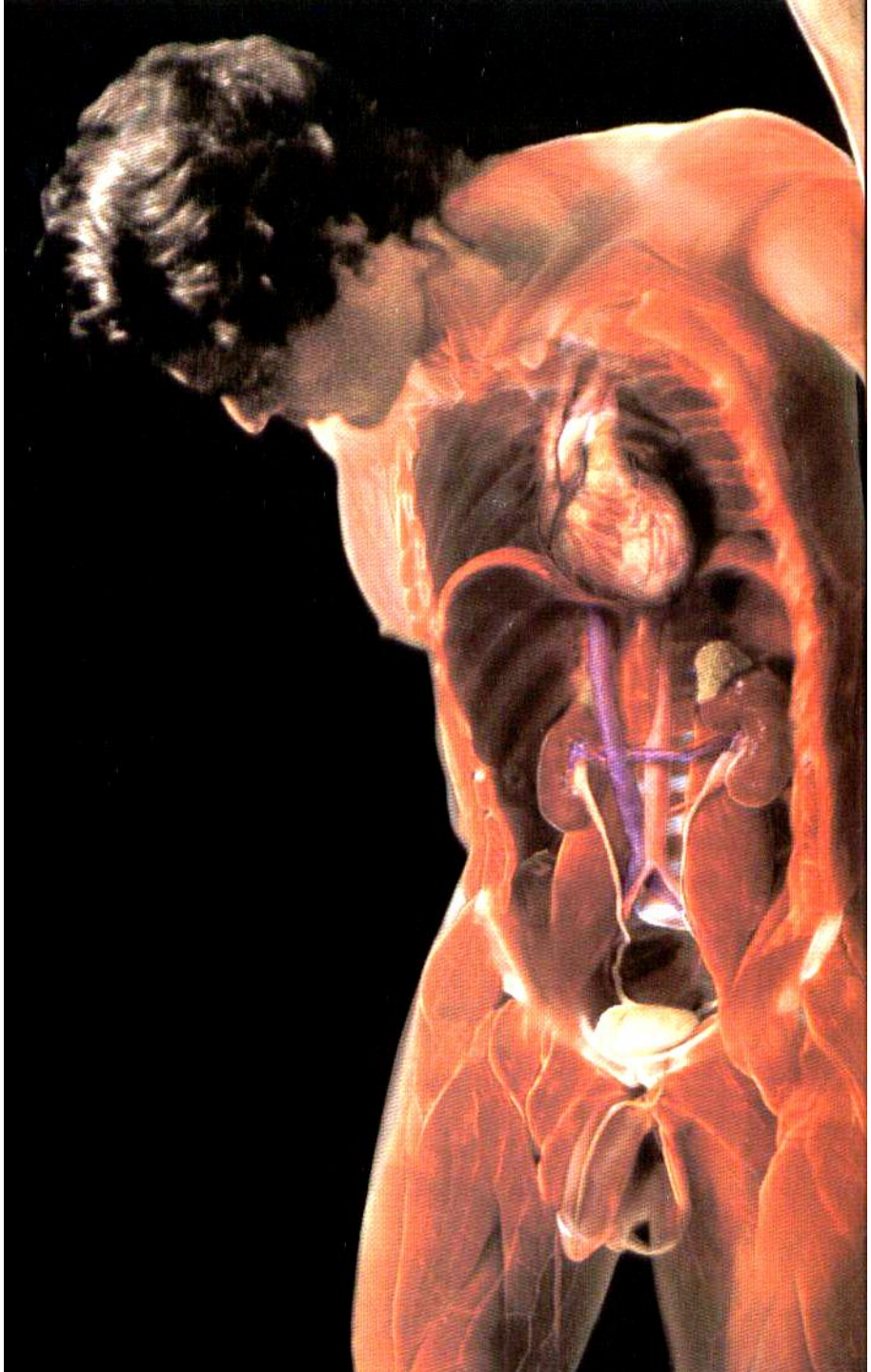

Veins of Spinal Cord and Vertebrae
Anterior external venous plexus
Posterior external venous plexus
Anterior internal venous plexus
Posterior internal venous plexus
Intervertebral v.
Basivertebral v.
Intervertebral v.
Anterior and posterior radicular vv.
Anterior external venous plexus
Anterior internal venous plexus
Basivertebral v.
Posterior internal venous plexus
Posterior external venous plexus
Anterior spinal v.
Basivertebral v.
Anterior internal venous plexus
Anterior central v.
Intervertebral v.
Anterior radicular v.
Posterior radicular v.
Internal spinal vv.
Pial venous plexus
Posterior central v.
Posterior spinal v.
Posterior internal venous plexus
CIBA

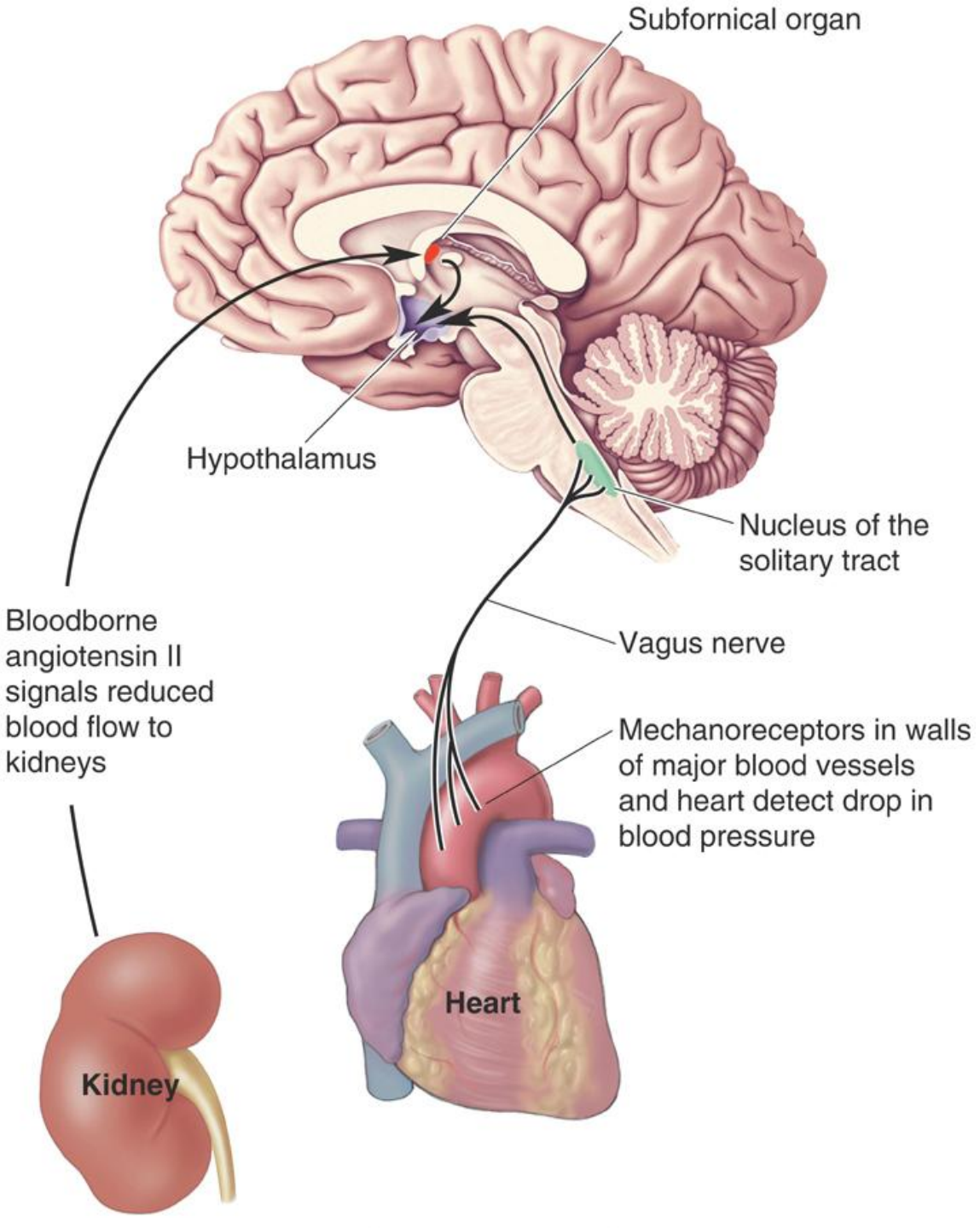
# 옆뿔 세포(외각 세포)

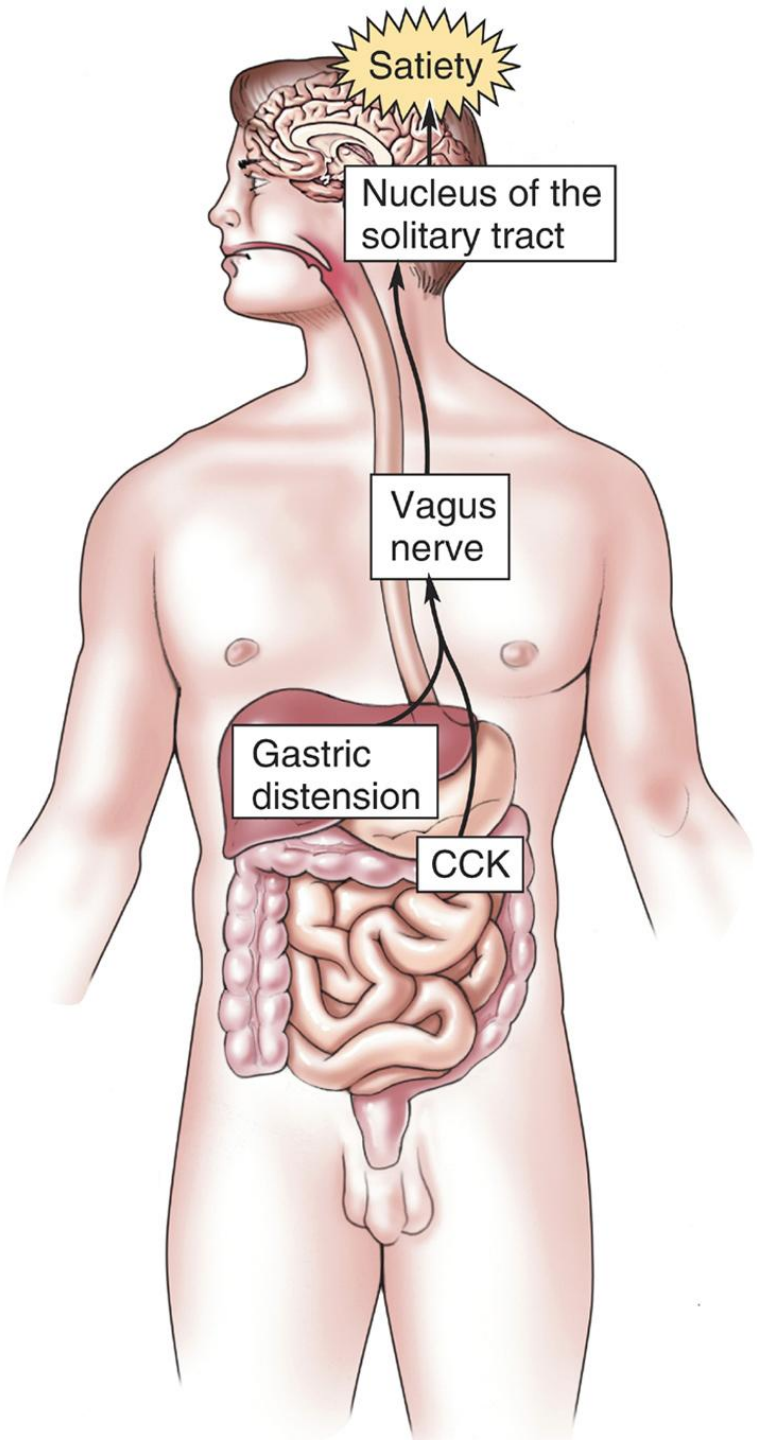


# 뇌와 자율신경

- 자율신경은 의지와 관계 없이 움직이는 신경-내장, 폐, 심장, 비뇨생식기, 등의 오장육부, 땀, 혈관, 림프순환 등
- 자율신경의 중심성 조절: 뇌




Subfornical organ
Hypothalamus
Nucleus of the solitary tract
Bloodborne angiotensin II signals reduced blood flow to kidneys
Vagus nerve
Mechanoreceptors in walls of major blood vessels and heart detect drop in blood pressure
Heart
Kidney

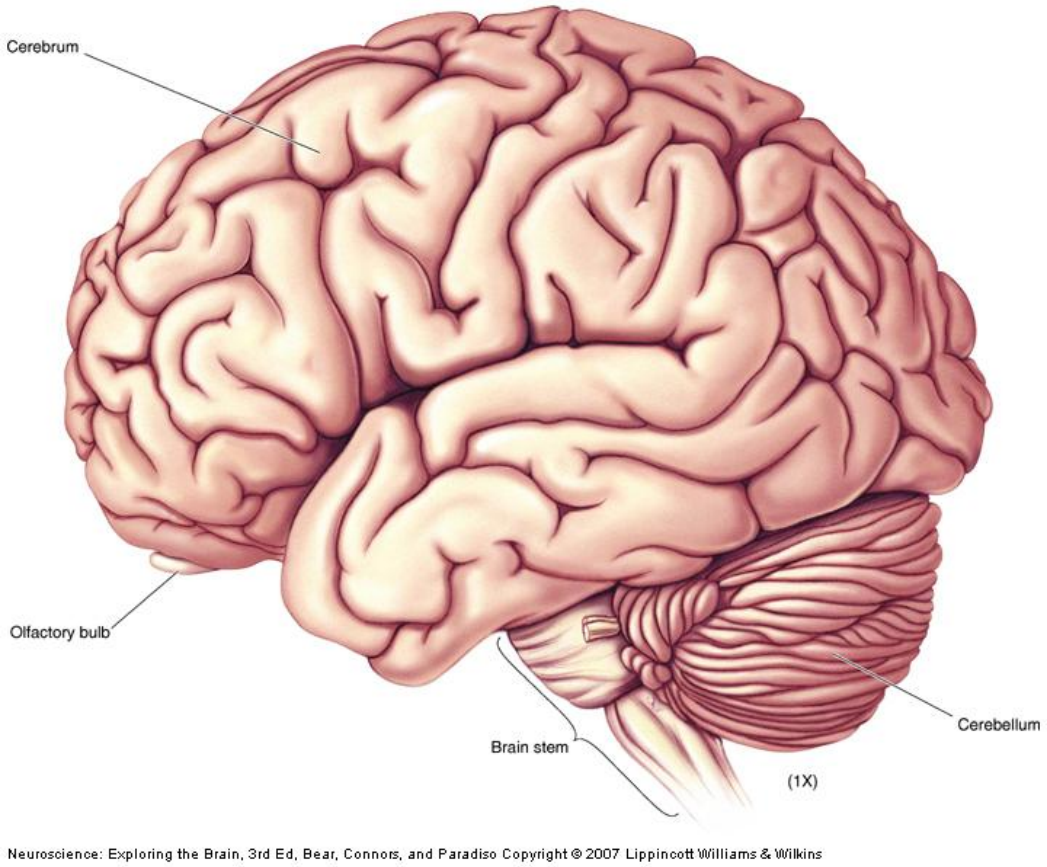

Satiety
Nucleus of the solitary tract
Vagus nerve
Gastric distension
CCK

# 뇌가 필요한 것

- 자극과 연료
- 자극: 시각, 청각, 미각, 촉각, 후각, 인식을 비롯한 뇌자체의 활동, 중력(고유감각-proprioception, baseline oscillation of muscle spindle)
- 연료: 포도당, 산소, 기타 영양소

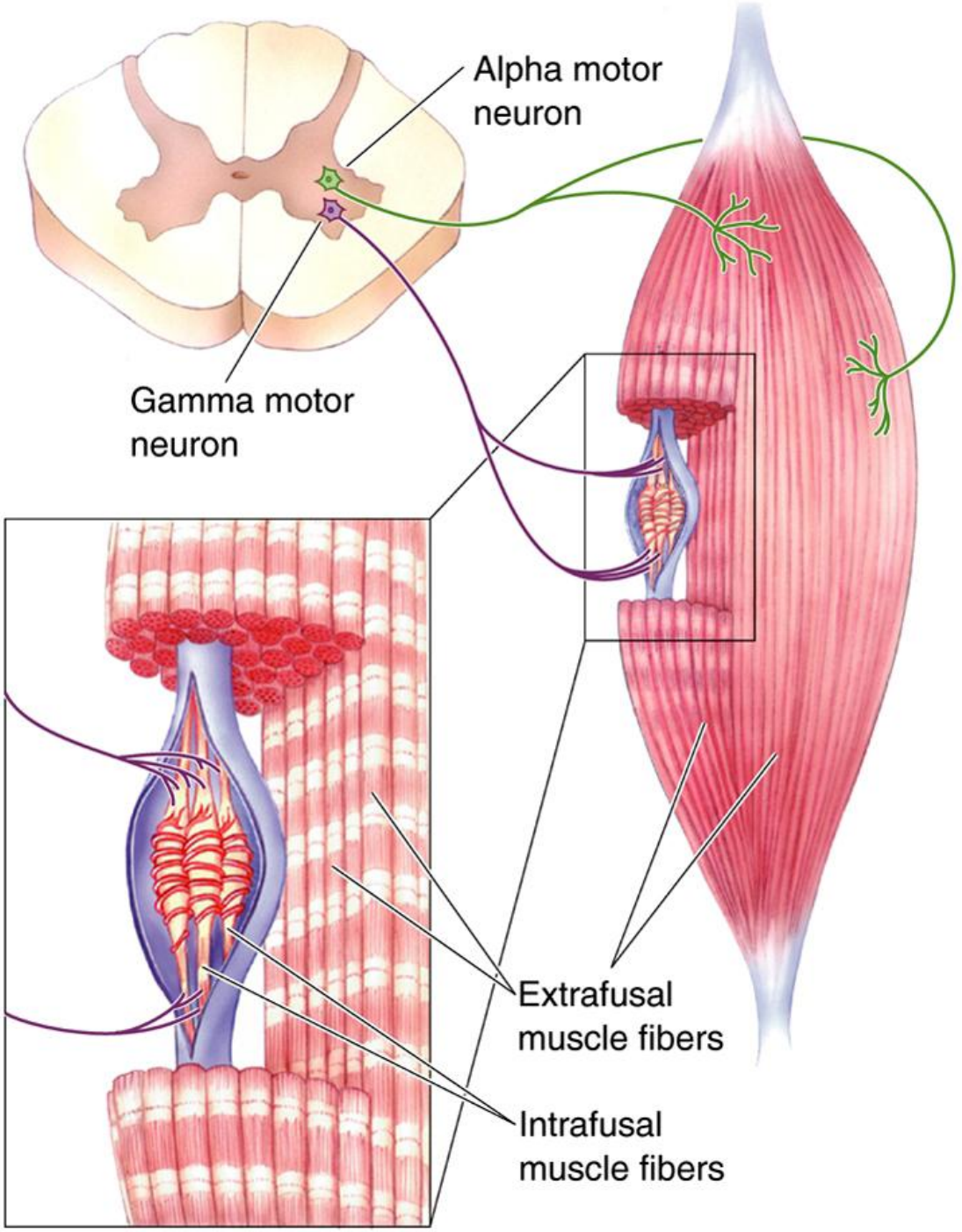
# 뇌에 가는 자극

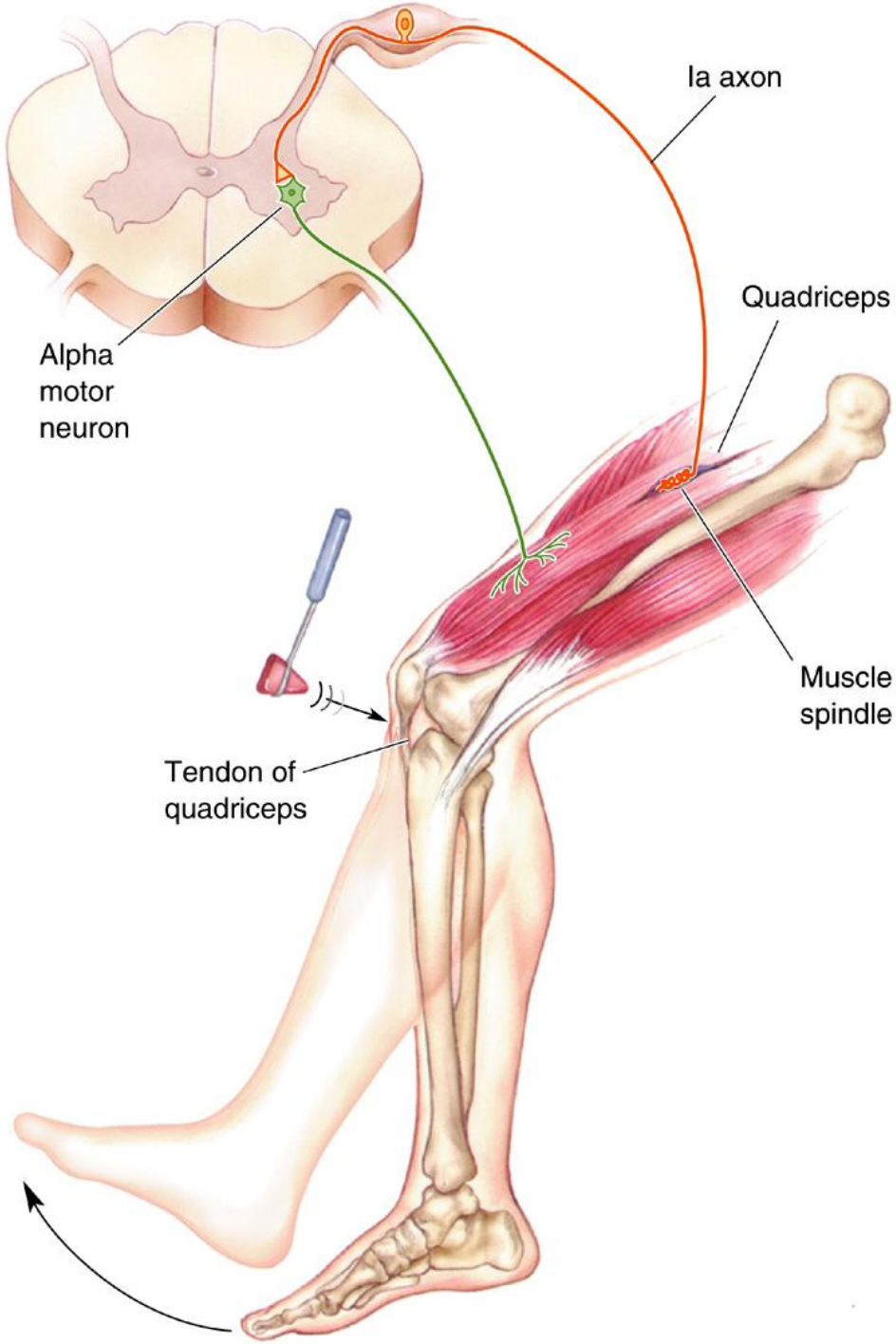
- 시각
- 청각
- 촉각
- 미각
- 후각
- 인식
- 중력(고유감각 수용
  체)-근육, 관절, 힘줄의
  센서-머리 가까운 목
  의 중심이 중요

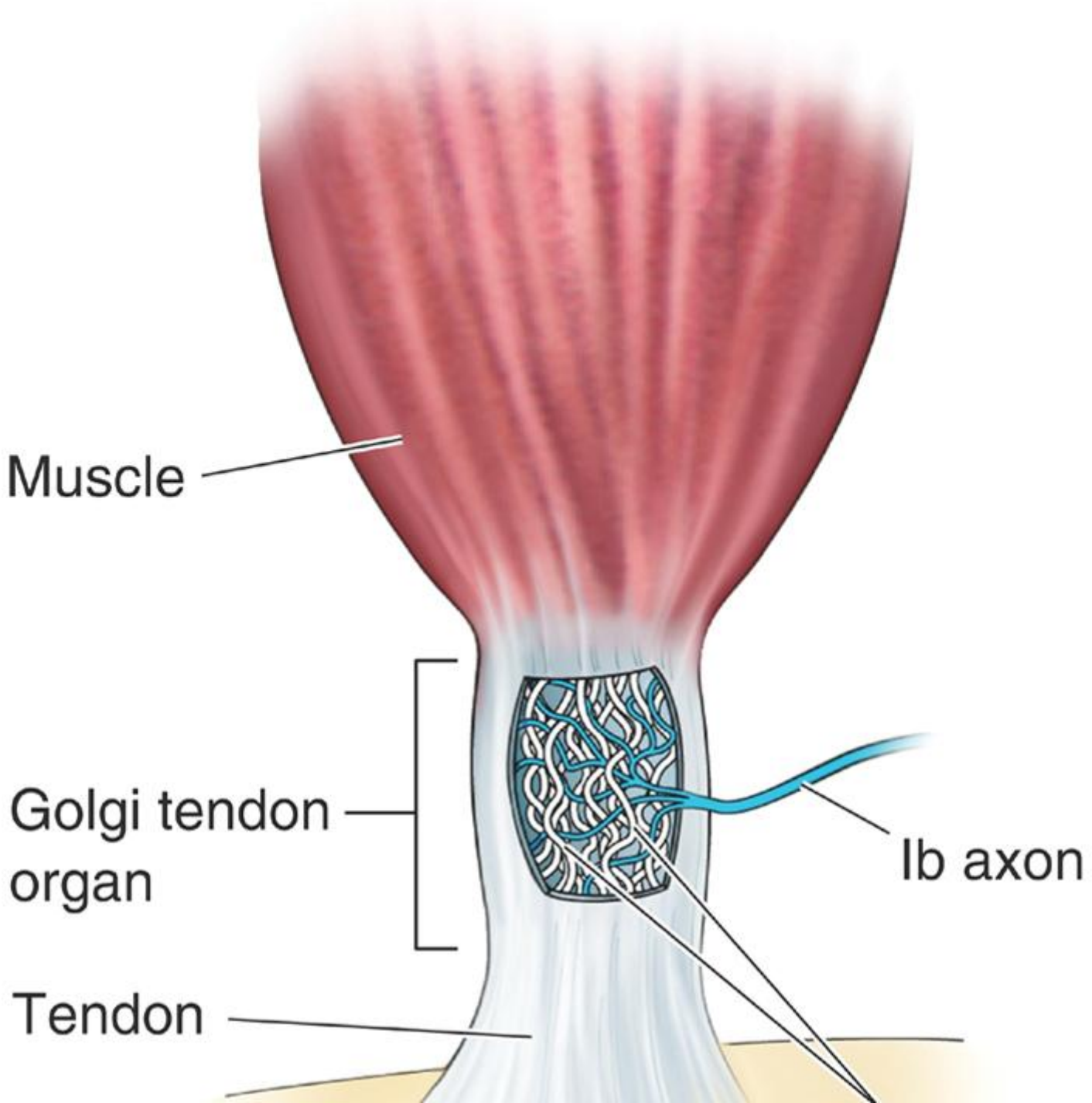


# 중력하에 자세를 유지하게 하는 고유감각

- 뇌 자극의 90%를 차지한다.
- 근방추(muscle spindle)-근육의 센서, 힘줄의 센서(tendon receptor), 관절의 센서(joint receptor)




Ia axon
Quadriceps
Alpha
motor
neuron
Muscle
spindle
Tendon of
quadriceps


Muscle
Golgi tendon organ
Tendon
Ib axon

# Receptor 감각수용체

- Tonic and phasic (지속성인 것과 일시적인 것이 있다.)
- sensory based receptor driving nervous system(신경계는 감각수용체에 의해서 많이 의존된다. 감각수용체에 의한 감각신경계가 신경계의 활동을 좌우한다.)

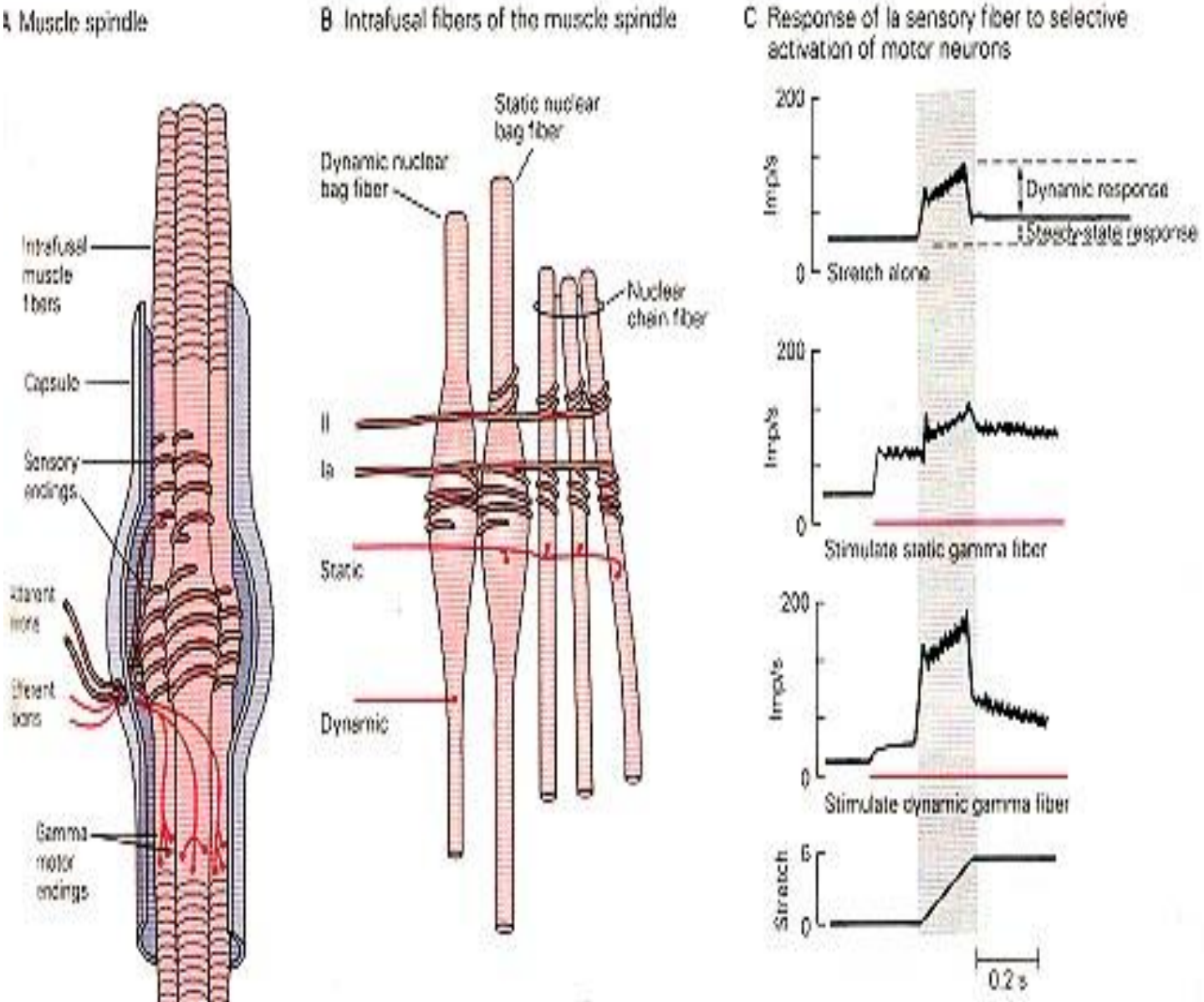
Continuous stimulation by earth gravitational field.

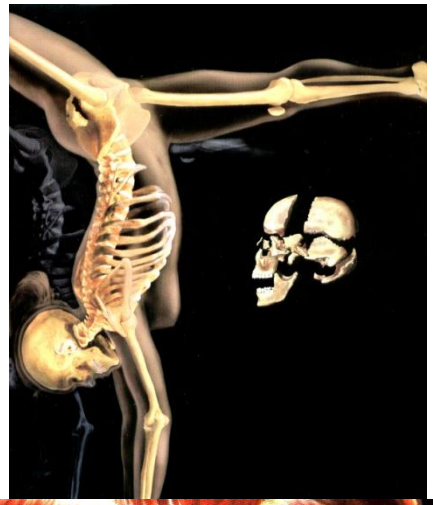
인체에 지속적으로 자극을 주는 감각은 중력이다.

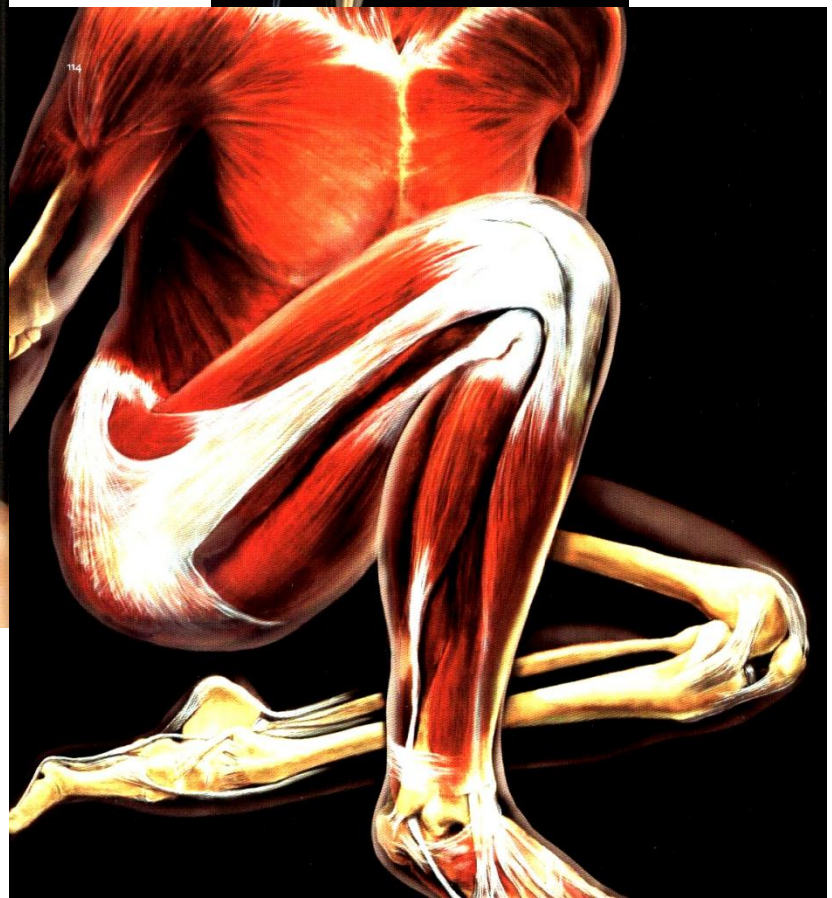
- Sight
- hearing
- temperature
- gravity -- earth gravitational stressors, cerebellar maturation, bipedality, three curve spinal system. 우주인이 우주공간에서 생활한 후의 인체에 생기는 문제들과 관련

# Muscle spindle 근방추- subluxation vs manipulation

- Eye, ear and the next complex sensory organ 눈, 코 다음으로 복잡한 신경구조
- Important in AK(maintenance, preventive, wellness & fittness). 도수치료를 하는 사람들에게 중요하다. 특히 신경계의 기능이 좋은 상태로 유지되도록 하고 예방적인, wellness, fittness에 특히 중요함.
- Ia afferent---------the greatest regulation of brain 근방추와 같은 고유감각수용체가 뇌의 기능을 유지하는 중요한 것이다.


A Muscle spindle
Intrafusal muscle fibers
Capsule
Sensory endings
Gamma motor endings
B Intrafusal fibers of the muscle spindle
Static nuclear bag fiber
Dynamic nuclear bag fiber
Nuclear chain fiber
II
Ia
Static
Dynamic
C Response of Ia sensory fiber to selective activation of motor neurons
200
Imp/s
0
Dynamic response
Stretch alone
Stimulate static gamma fiber
Stimulate dynamic gamma fiber
Stretch
0.2 s




114

# 뇌가 필요한 연료

- 산소, 포도당, 기타 영양소
- 혈액을 통해서 (심장, 혈관)-자율신경의 활동
- 산소는 폐, 횡격막(가로막), 기타 호흡근의 활동: 단전호흡

# Pathomechanic manipulation
# wrong side manipulation

# Brain function and adjustment
# 뇌기능과 도수치료

- It is very important to measure brain function before manipulation because the same manipulation can do good or harm.

  도수치료를 하기 전에 뇌기능을 정확하게 평가하는 것이 중요하다. 잘못 치료하면 뇌기능이 떨어진다.
- Wrong side adjustment 좌, 우
- Pathomechanic adjustment 치료방법의 문제

# 소뇌이상의 진단

- Tandem gait 일자로 걷기
- 한발로 서기
- Coordinated movement, dysdiadochokinesia
- Eye movement, ocular lock
- Optokinetic response

# 어지럼증

- 전정기관-소뇌 geocentric vertigo
- 대뇌 eogcentric vertigo
- 부신
- 빈혈

# Head and face pain

- 많은 환자
- mechanical (cervicogenic headache)
- vascular headache.

# Mechanical headache (cervicogenic headache) 경추성 두통

- Biomechanical aberration of upper cervical region can evoke nociception (type IV joint mechanoreceptor) through spinal trigeminal tract and VPM of thalamus etc
- 상부경추의 이상

# Vasomotor headache
# 혈관성 두통

- Vasoconstriction & ischemia다음에 reflex dilatation이 근본 원인
- Blood vessel is controlled by autonomic nervous system which is embryologically projected from hypothalamus to the end of the cord.
- Vasodilatation increases the fof of perivascular plexus afferent which evokes nociception. Extracerebral vasodilatation will induce intracerebral vasoconstriction for maintaining cerebral blood flow. If there is vasoconstriction in the intracerebral area, platelet will release serotonin due to increased blood pressure.
- Serotonin is inhibitory to the norepinephrine which will cause vasodilation and localized pain such as eye or ear pain.
- Another factor, EDRF(endothelial detecting releasing factor = nitric oxide) can be released, which is also inhibitory to the norepinephrine. It is a kind of defense mechanism for prevention of the rupture of the vessels.

- If there is an intracerebral vasoconstriction which will cause ischemia, symptom of the patient can be aura or headache (migraine headache).

# Postexercise headache

- During the exercise, considerable amount of blood can be delivered to the periphery which means extracranial arterial dilation. It can make intracranial vasoconstriction which evokes headache
- cf post coital headache

# Hunger headache

- Decreased blood glucose level can induce vasoconstriction which leads to reflex dilatation – headache.
- Longstanding migraine is related to the glucose intolerance (adult onset diabetes).

# Examination of the vascular headache

- ophthalmoscopic exam
- photosensitivity: it can be painful because decreased CIS of EW or neurons of end organ can not control the papillary constriction. Too much visual stimulation can evoke pain.  In this case, treatments are to keep quiet, decrease light. If not, increased FRA will evoke anoxic depolarization which make worse.

# Headache in bending forward

- Cerebral vasodilatation can be worse due to increased abdominal pressure which decreases venous return.

# Age/sex

- Female thirties; headache is common due to less active, decreased motor tone, decreased vasomotor tone, peripheral vascular compromise, cerebrovascular problem, and hormonal influence.

# Post-traumatic headache

- 기본적인 기전은 dorsal horn에서 nociception의 pathological windup
- Initial injury especially cervical region such as whiplash may evoke nociception through anterolateral system to thalamocortex, and retidular formation and may also cause biomechanical aberration.
- After a certain period of time, there is no longer tissue compromise which means no nociceptive stimulation from external injured tissue but in cord level can develop spinal wind up. Therefore without external nociceptive information through DRG, spontaneous firing of nociception can be fired at the cord level (upper cervidal level). Patient continuously can complain headache. It may be worse by anxiety because frontoorbital projection fires to the reticular formation which may stimulate further the trigeminal nucleus.
- Application: to break up the pattern of spinal windup (pathological) is manipulation.

# Classic migraine; vascular headache.

- Extracerebral vasodilatation can induce intracerebral vasoconstriction for maintaining blood flow. Intracerebral vasoconstriction in a certain period of time can evoke reflex vasodilatation through two mechanism.
- increased blood presssre can injure or rupture platelet which will release serotonin which is inhibitory to the norepinephrine. It causes vasodilatation which make patient feel headache or localized pain through perivascular plexus nociceptive afferentation.
- EDRF (nitric oxide) can be released, which is also inhibitory to the norepinephrine. It is a kind of defense mechanism for prevention of vascular rupture.

- If there is a significant vasoconstriction which will cause ischemia, sx can be aura or headache.  Ischemia can evoke anoxic depolarization because CIS of neuron will bring to close to threshold due to decreased O2 , ATP etc which can lead to spontaneous depolarization.
- Then patient can experience various site of prodrome.

- Longterm migraine headache should be evaluated by MRI or CT scan because there are high probability to get ischemic or infarction area of the brain.

# application

- blood vessel diameter is controlled by the ANS (IML). Segmental LDA will decrease nociceptive afferent at the cord level which cause reflex vasoconstriction and will also increase stimulation on the contralateral side of decreased hemisphericity for decreasing IML. Long term migraine can have a lot of possibility to get silent ischemia or infracted area of the brain. In this case, MRI or CT scan will be recommended before starting treatment.
- O2 therapy can be applied according to patient condition such as hypoxia , decreased PH etc.
- Rib manipulation can be helpful in order to deliver substrate to the brain tissue (the area of compromise). Electric modality such as IF (subthreshold) can be applied.

# Triceps – medial and lateral heads

Spinal

Levels: Innervation: C-(6),7,6 (T-1)

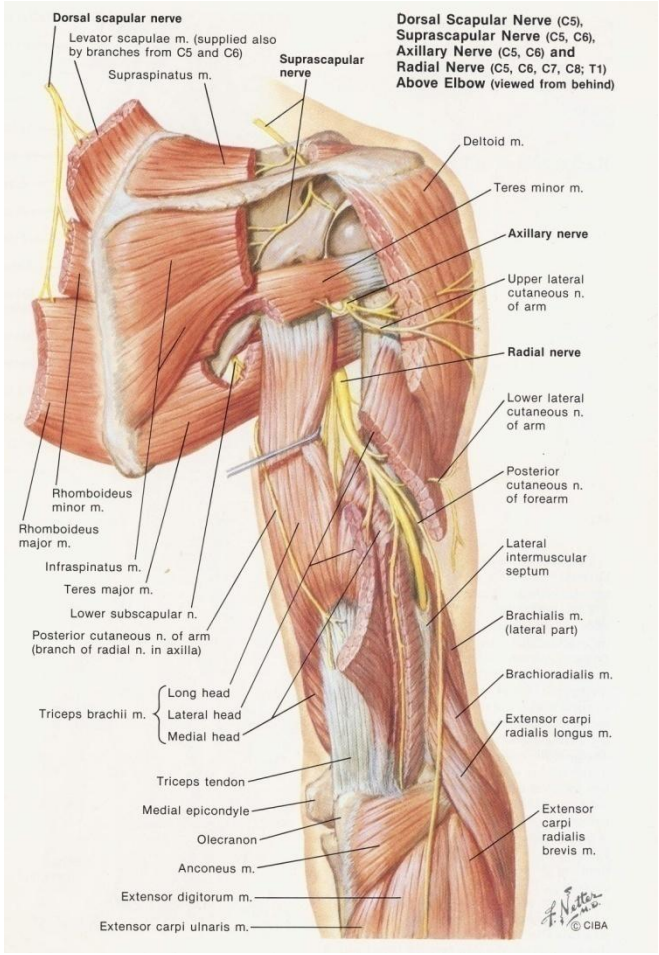
TS Line/Meric: T-6 배수혈: T-11/12

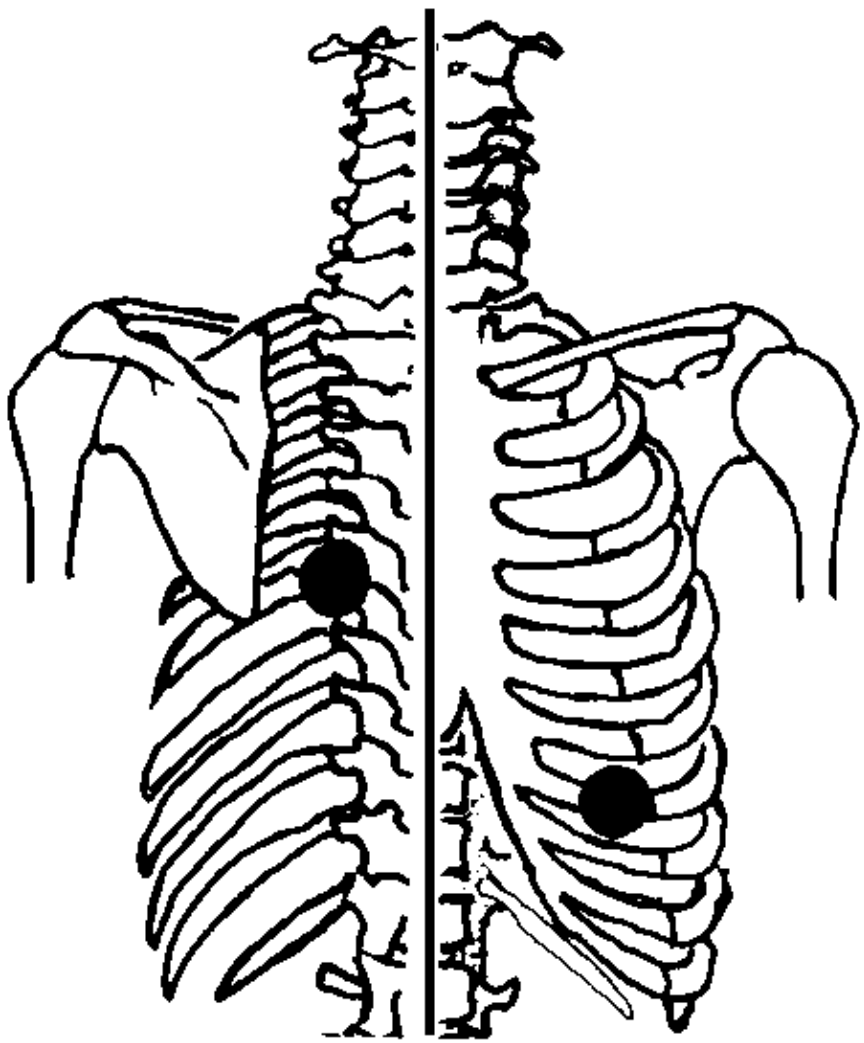
기관: 췌장 – 혈당 조절; 소화기 효소 부족

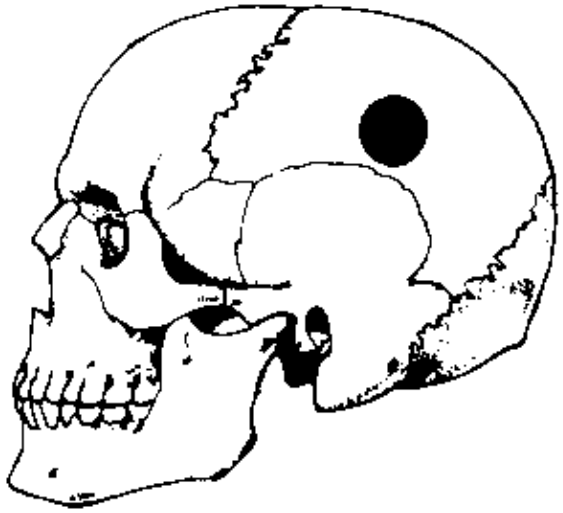
경락: 비-췌장

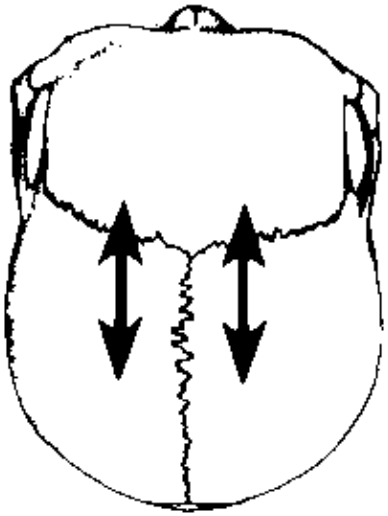
영양: metabolic synergy, glucosupreme

Chapman's Reflex: Ant: Left 7th IC space, medial portion, 7th costal cartilage; Post: Left T-7/8









# Triceps – medial and lateral heads

- 임상적 적응증:
- 주관절 문제 'tennis elbow' "golf elbow"
- 췌장-고인슐린증에서는 triceps가 overactive된다

# Triceps – long head

- 기시: Infraglenoid tubercle of scapula
- 종지: Upper posterior surface of oIecranon; deep fascia of forearm
- 기능: elbow extension; shoulder extension; long head and lateral head are comparable with the biceps brachii
- Spinal Levels: Innervation: C-(6),7,6 (T-1) TS Line/Meric: T-6 배수혈: T-11/12
- 기관: 췌장 – 혈당 조절; 소화기 효소 부족
- 경락: 비-췌장

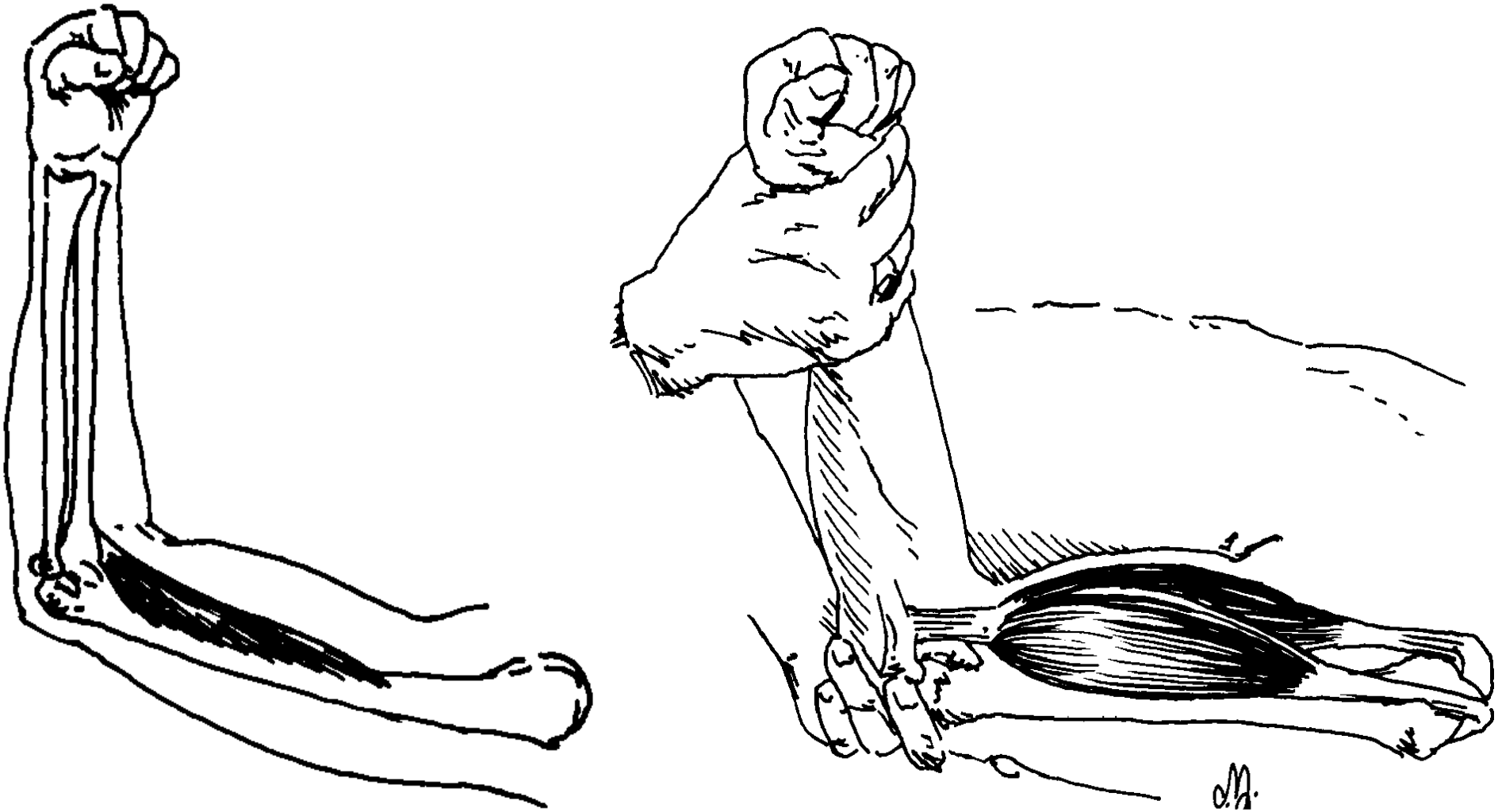
# Triceps – long head

- 임상적 적응증:
- 주관절 문제
- 견관절 통증 및 ROM 저하
- 팔 뒷굼치 하기 힘들다
- 췌장 – 고인슐린증에서는 triceps가 overactive된다

# Brachialis

- 기시: Lower anterior humerus (extensive)
- 종지:  tuberosity of ulna
- 기능: flexes elbow (biceps brachii often gets credit for work done by brachialis)
- Spinal Levels: Innervation: C-5,6 (musculocutaneous) TS Line/Meric: N/A 배수혈: T-12/L-1
- 기관: 위장
- 경락: 위장

# Biceps brachii/brachialis



# Brachialis

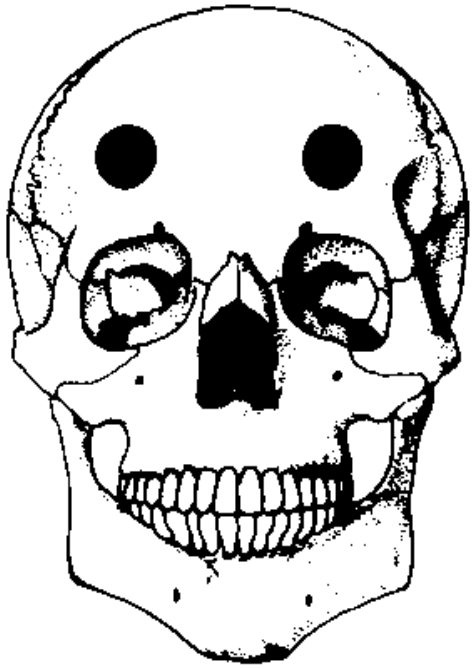
- 영양: 위산; (duodenal concentrate; 클로로필)
- Chapman's Reflex: (Bilateral) Ant: $4^{th}/5^{th}$ IC spaces; Post: C-2 (T-4/5)
- 임상적 적응증:
- biceps brachii와 더불어 테스트
- 주관절 굴곡시 통증이나 ROM저하
- 고인슐린 증에서는 양측 모두 약할 수 있다
- Ulna subluxations
- 위장

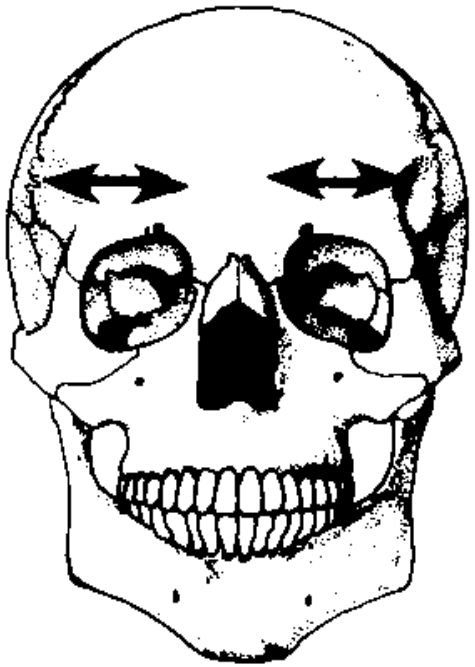
# Biceps brachii

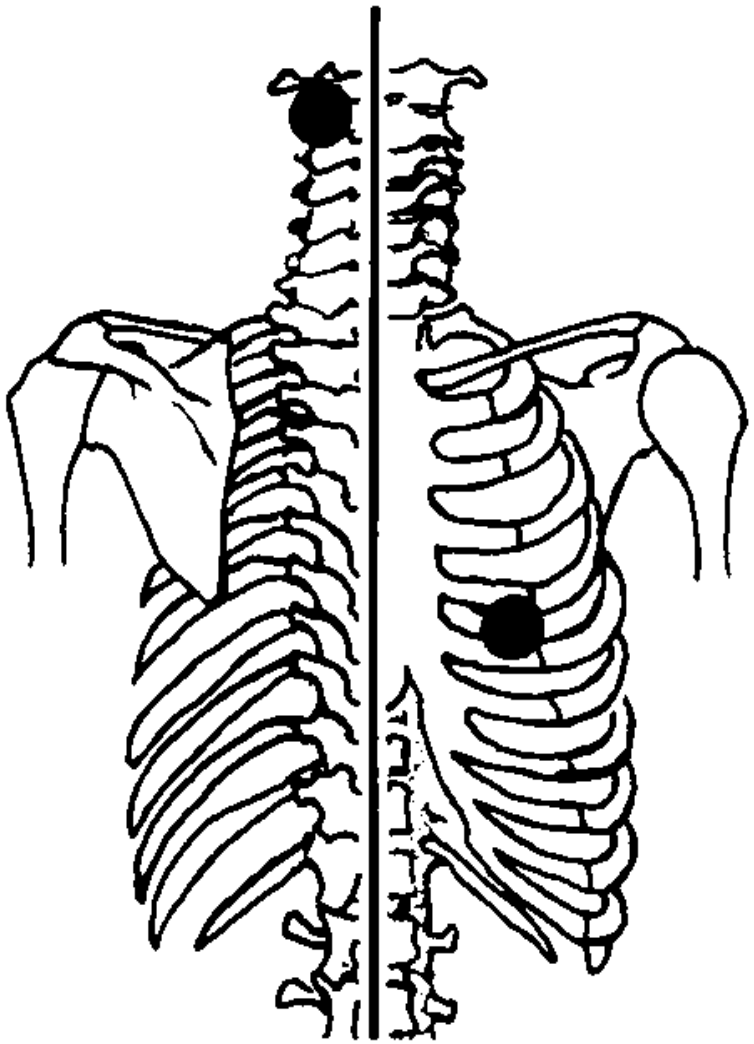
- Long head - 기시: Supraglenoid tubercle of scapula
- Short head - 기시: Coracoid process
- 종지: Tuberosity of radius; Lacertus fibrosis (=deep Aponeurosis continuous with deep fascia of forearm)
- 기 능 : 주 관 절 굴 곡 (especially against resistance – assists brachialis); supinates forearm (especially against resistance - assists supinator); flexes shoulder; helps retain humeral head in glenoid fossa (long head only)

# Biceps brachii

- Spinal Levels: Innervation: C-5,6 (musculocutaneous) TS Line/Meric: N/A 배수혈: T-12/L-1
- 기관: 위장
- 경락: 위장
- 영양: 위산; (duodenal concentrate; 클로로필)
- Chapman's Reflex: (Bilateral) Ant: $4^{th}/5^{th}$ IC spaces; Post: C-2 (T-4/5)







# Biceps brachii

- 임상적 적응증:
- Slipped bicipital tendon – 어깨를 올린 후 되돌아 올 때 통증이 온다
- 고인슐린증에서 양측 모두 약할 수 있다
- Radius subluxations
- 주관절 굴곡시 통증 및 ROM 저하

# Biceps brachii

- forearm supination하기 어렵다(통증이나 ROM 저하), 특히 저항이 있을 때.
- 스크루 드라이버 사용시
- Long head는 기시부위에서 손상될 수 있다.
- 위장

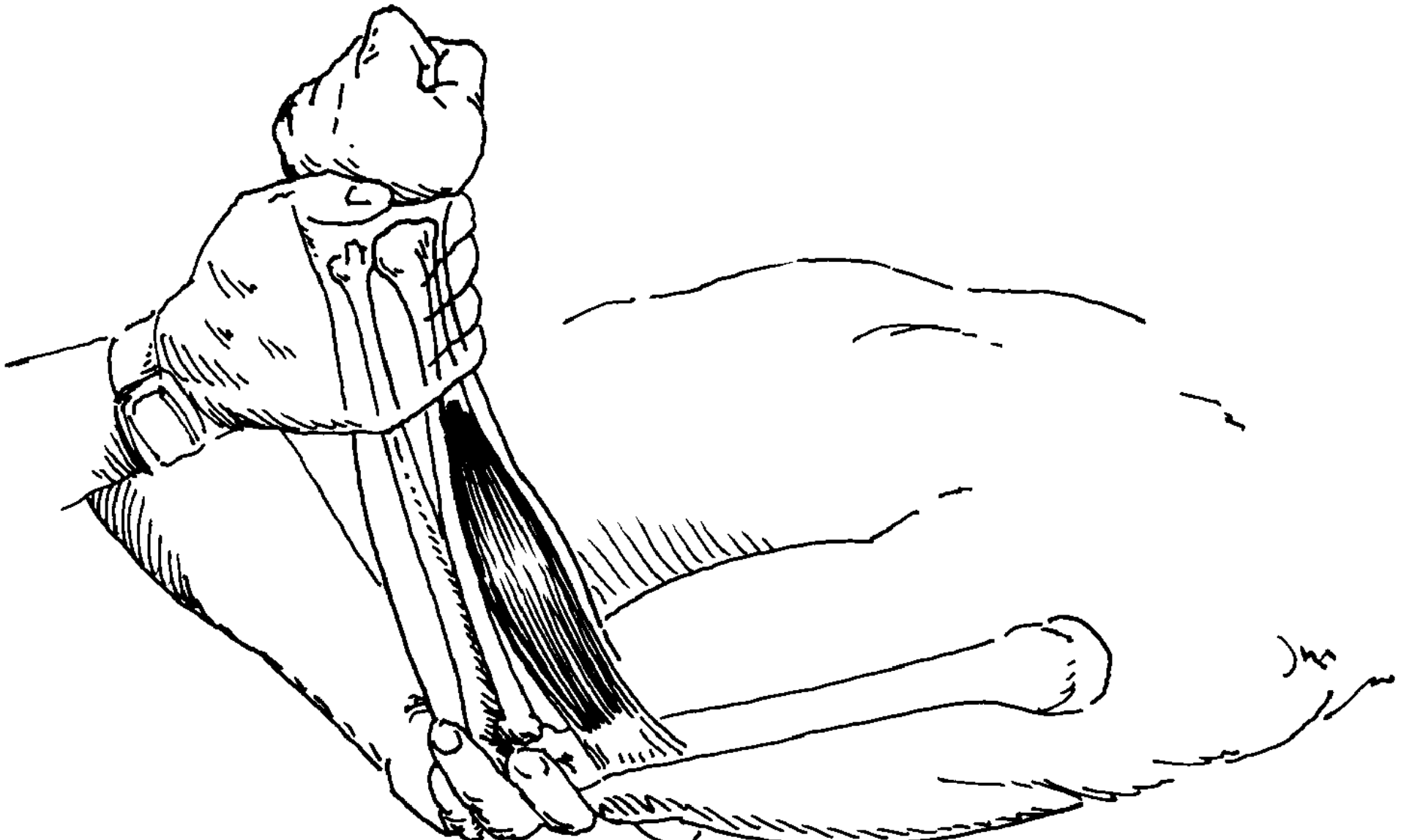
# Brachioradialis

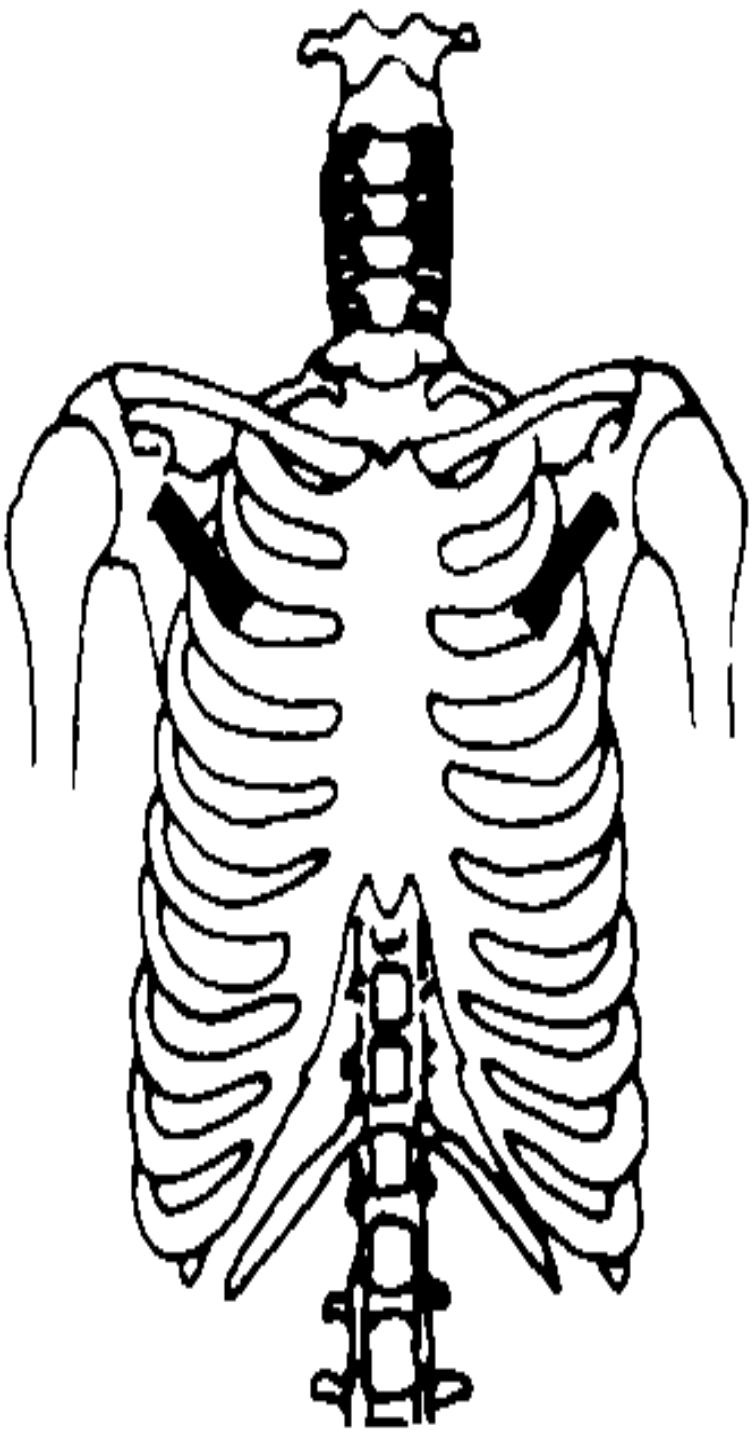
- 기시: Proximal 2/3rd of supracondylar ridge (from lateral epicondyle to halfway up humeral shaft)
- 종지: By a long, ribbon-like tendon to the lateral base of styloid process of the radius
- 기능: flexes elbow, especially with forearm semi-pronated (especially with heavy loads or rapid movements) as in carrying a coat, or carrying a baby; hitch-hiking motion or thumbs-up motion

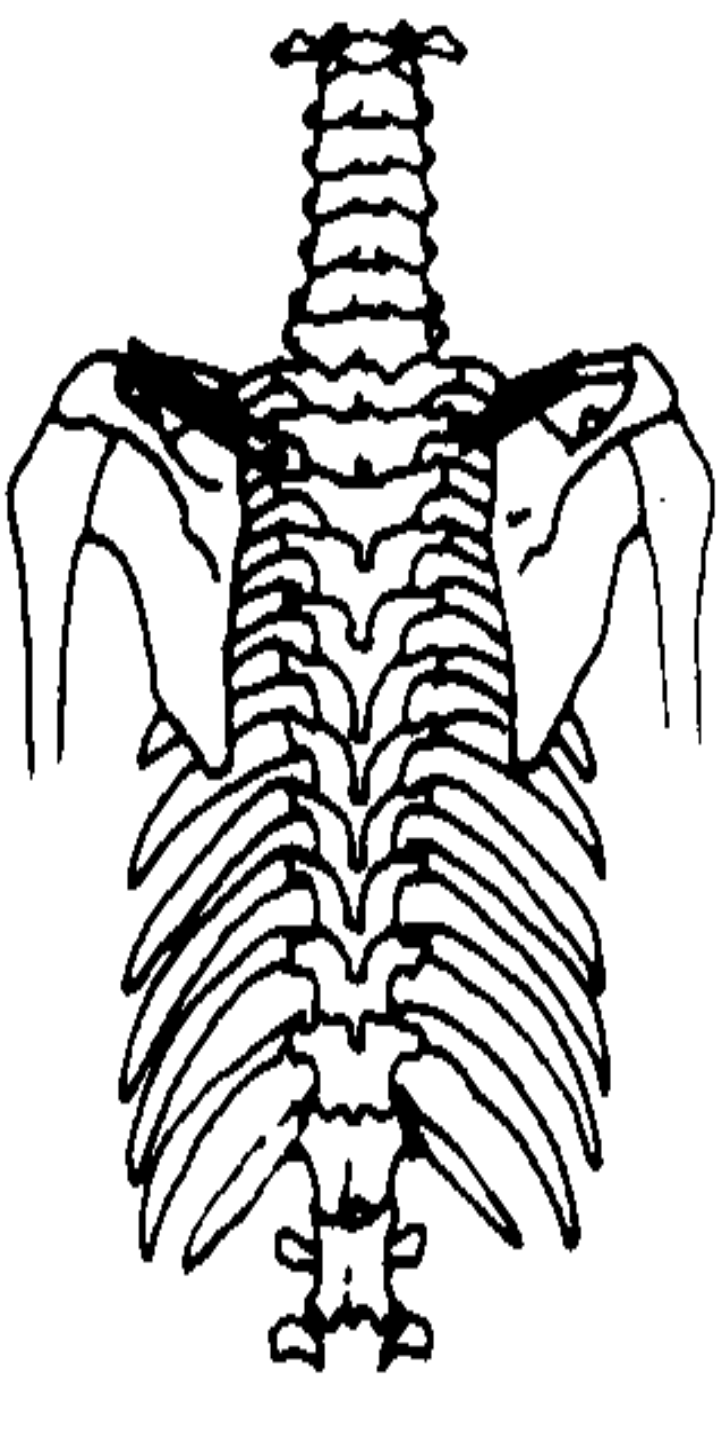
# Brachioradialis

- Spinal Levels: Innervation: C-5,6 (radial) TS Line/Meric: N/A 배수혈:T-12/L-1
- 기관: 위장
- 경락: 위장
- 영양: N/A
- Chapman's Reflex: (Bilateral) Ant: Entire pectoralis major muscle; Post: Over supraspinatus origin

# Brachioradialis





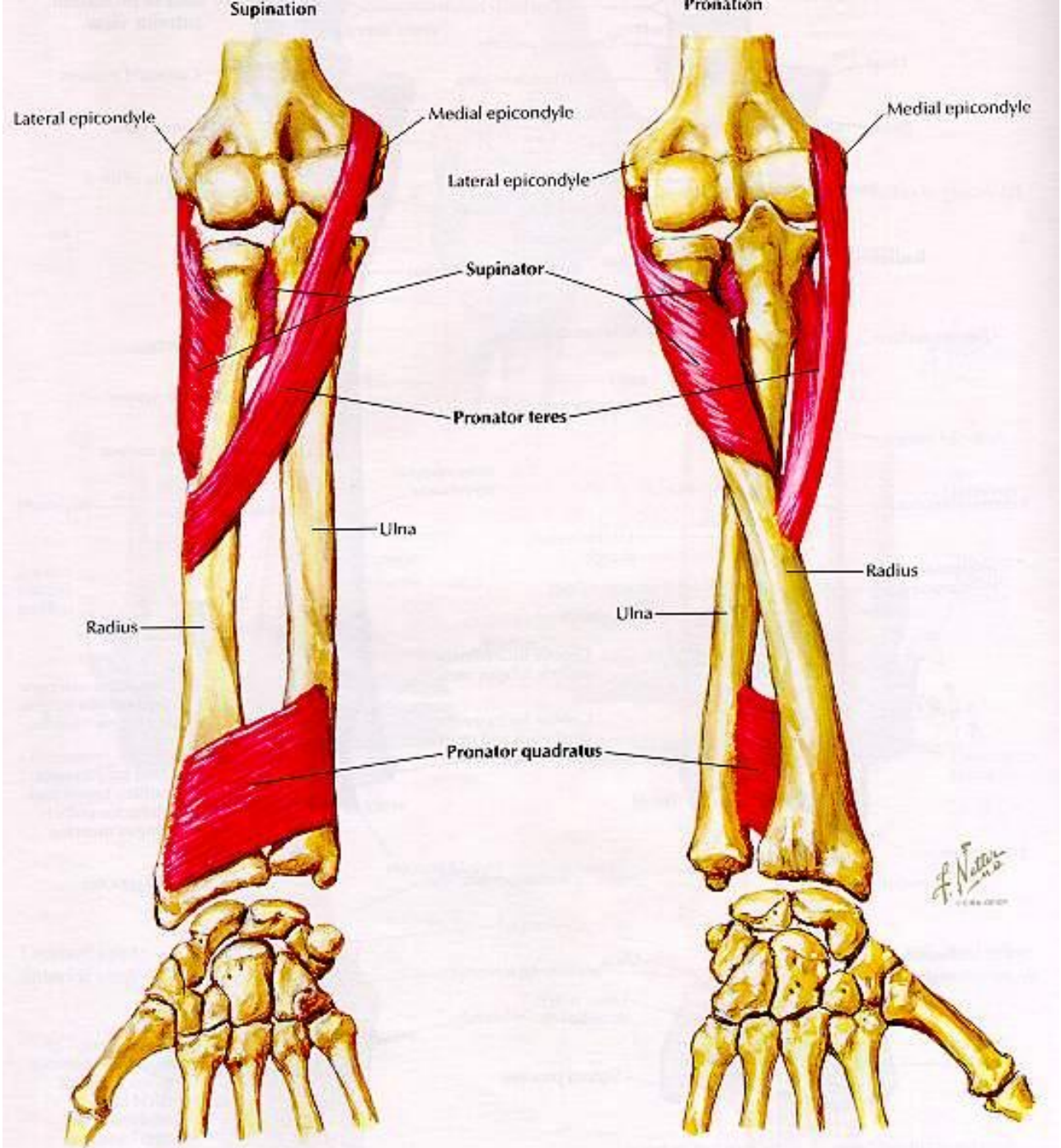


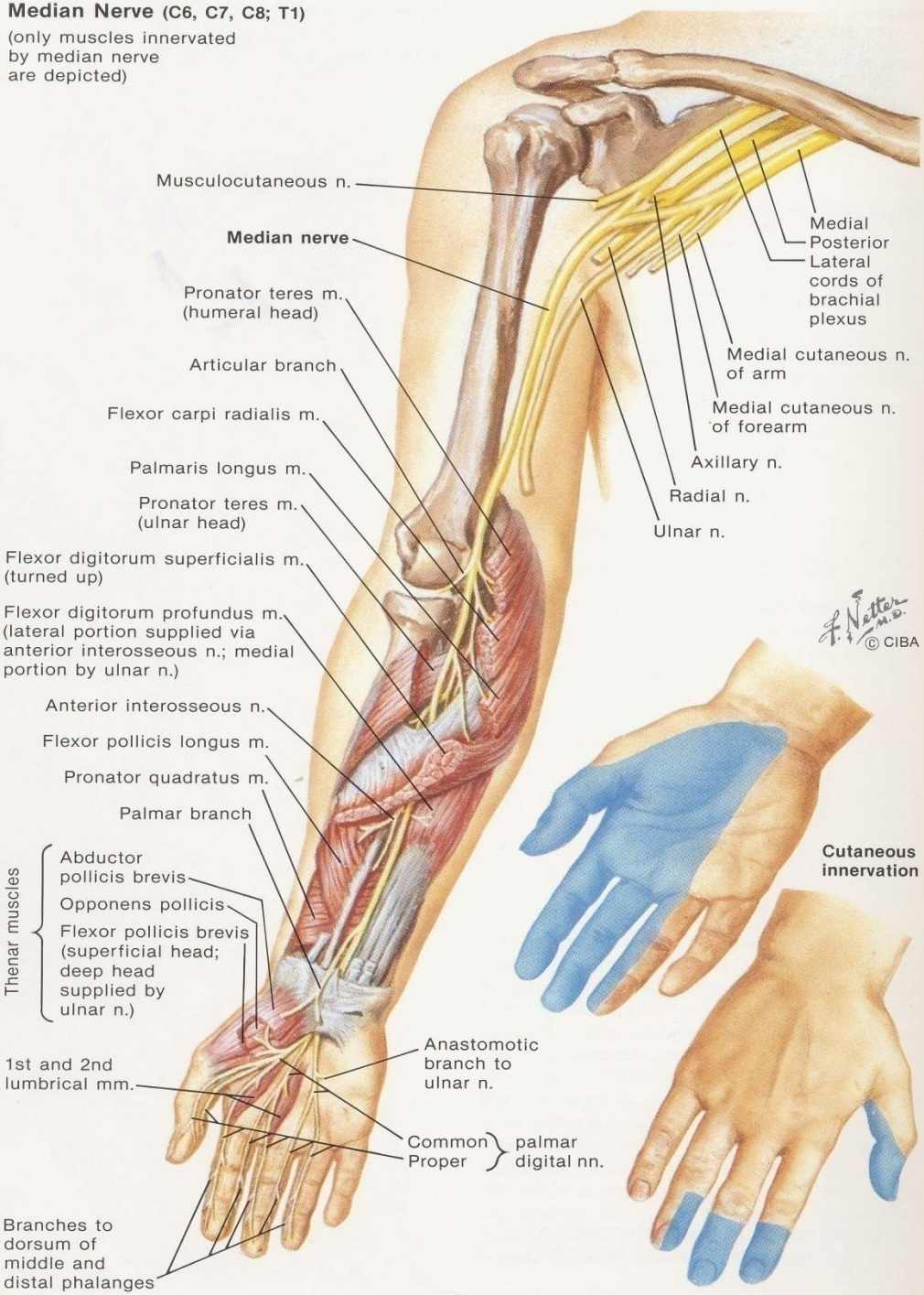
# Brachioradialis

- 임상적 적응증:
- 주관절 통증(보통 기시부위)
- 팔이semi-pronated 위치에서 물건을 들 때 통증이 있거나 fatigue가 있다
- 일반적인 신경과민 증세가 있는 경우 이 근육이 약해진다(Chapman's NL reflex)

# Pronator teres

- 기 시 : Humerus-medial epicondyle; ulna-medial side of coronoid process
- 종지: Radius – middle of the lateral shaft where bowing reaches its maximum
- 기 능 : elbow flexion; forearm pronation, especially when power is needed
- Spinal Levels: Innervation: C-6,7 (median) TS Line/Meric: N/A 배수혈: T-12/L-1
- 기관: 위장
- 경락: 위장


Supination
Pronation
Lateral epicondyle
Medial epicondyle
Lateral epicondyle
Medial epicondyle
Supinator
Supinator
Pronator teres
Ulna
Radius
Radius
Ulna
Pronator quadratus


Median Nerve (C6, C7, C8; T1)
(only muscles innervated by median nerve are depicted)
Musculocutaneous n.
Median nerve
Pronator teres m. (humeral head)
Articular branch
Flexor carpi radialis m.
Palmaris longus m.
Pronator teres m. (ulnar head)
Flexor digitorum superficialis m. (turned up)
Flexor digitorum profundus m. (lateral portion supplied via anterior interosseous n.; medial portion by ulnar n.)
Anterior interosseous n.
Flexor pollicis longus m.
Pronator quadratus m.
Palmar branch
Thenar muscles
Abductor pollicis brevis
Opponens pollicis
Flexor pollicis brevis (superficial head; deep head supplied by ulnar n.)
1st and 2nd lumbrical mm.
Branches to dorsum of middle and distal phalanges
Anastomotic branch to ulnar n.
Common
Proper
palmar digital nn.
Medial
Posterior
Lateral
cords of brachial plexus
Medial cutaneous n. of arm
Medial cutaneous n. of forearm
Axillary n.
Radial n.
Ulnar n.
F. Netter M.D.
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Cutaneous innervation

# Pronator teres

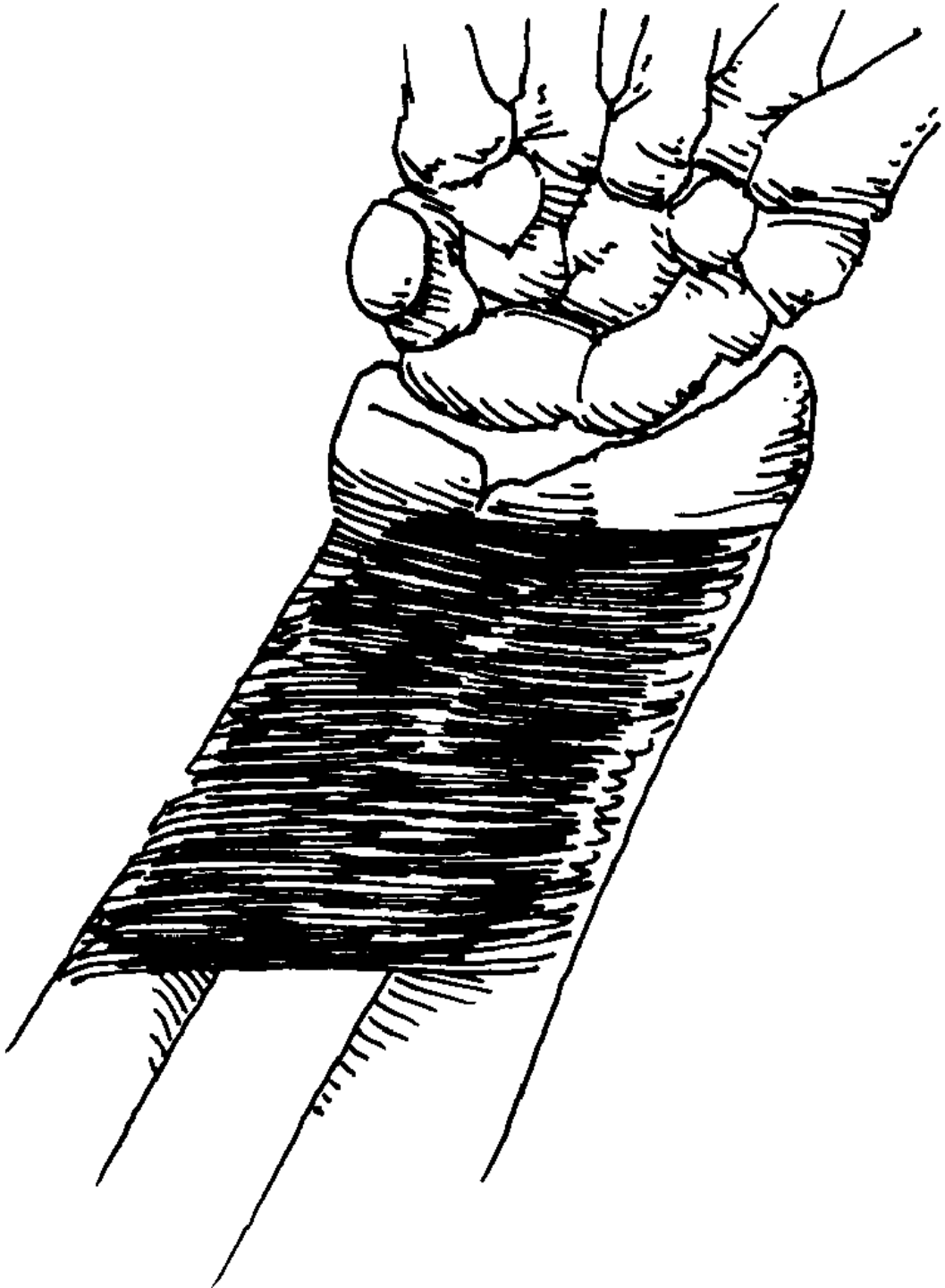
- 영양: N/A
- Chapman's Reflex: (Bilateral) Ant: On anterior chest wall behind areola (*not* in the breast tissue); Post: Below inferior angle of scapula
- 임상적 적응증:
- 주관절 굴곡/신전을 통해 구별한다: pronator teres & pronator quadratus tests
- 스크루 드라이버를 사용해서 나사를 풀 때 어렵다

# Pronator teres

- 주관절 통증 – medial epicondylitis
- Radius subluxations
- 수완관절 통증-특히 pronation할 때
- Wrist subluxations
- 위장, 대장(?)

# Pronator quadratus

- 기시: Front of ulnar shaft just above wrist joint (distal 1/4 of ulna)
- 종지: Front of radius shaft just below wrist joint; distal ¼ of radius – most anterior and medial areas
- 기능: pronates forearm; stabilizes radius and ulna at wrist
- Spinal Levels: Innervation: C-7,8 T-1 (median) TS Line/Meric: N/A 배수혈:T12/L1



# Pronator quadratus

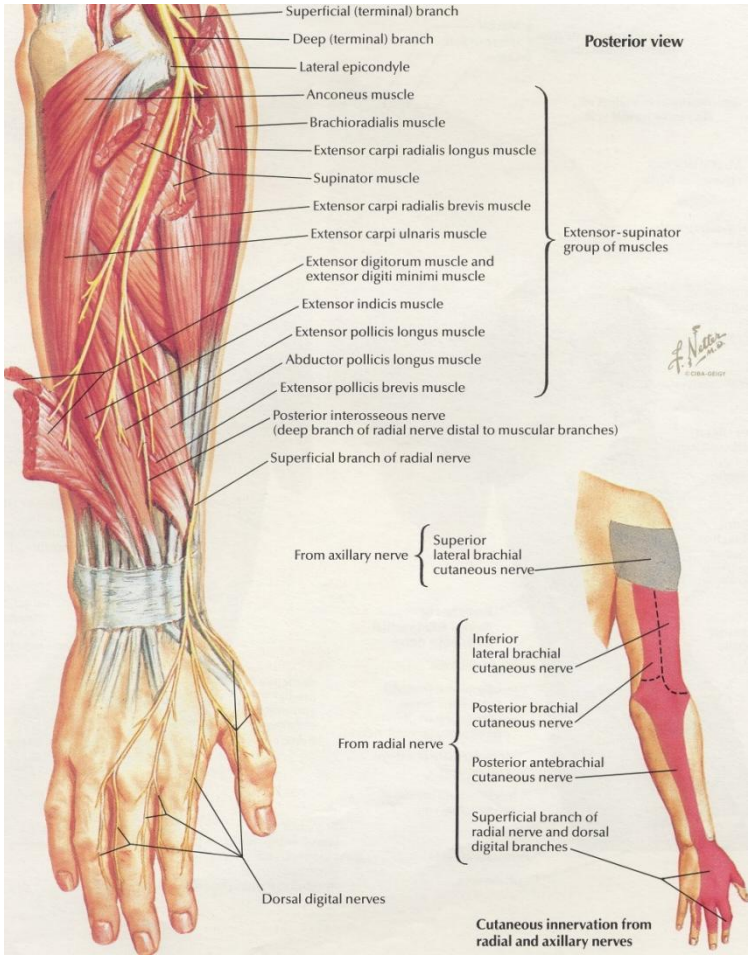
- 기관: 위장
- 경락: 위장
- 영양: N/A
- Chapman's Reflex: (Bilateral) Ant: On anterior chest wall behind areola (*not* in the breast tissue); Post: Below inferior angle of scapula
- 임상적 적응증:
- 주관절 굴곡/신전을 통해 구별- pronator teres and pronator quadratus tests

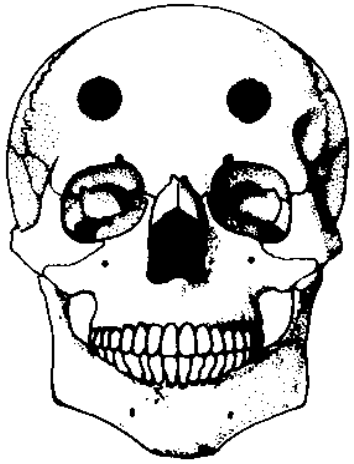
# Pronator quadratus

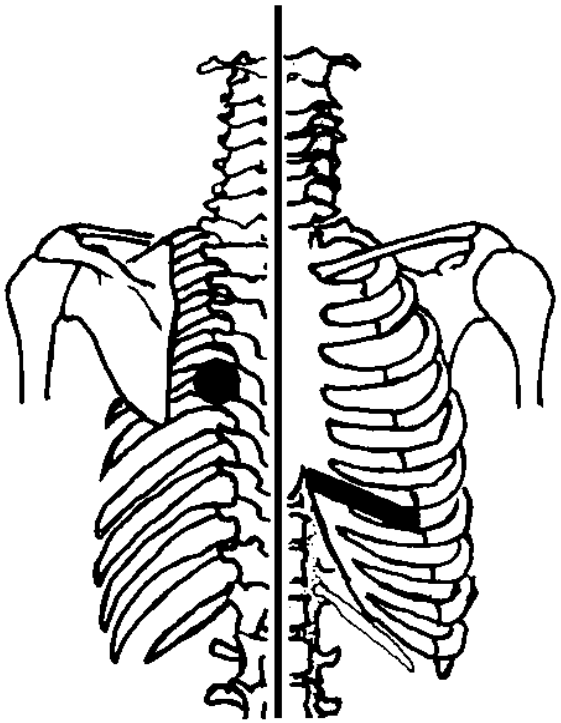
- 나사 풀기가 어렵다
- push-ups 등 하기 힘들다
- Carpal tunnel syndrome
- Wrist subluxations
- 주관절 통증
- 대장(위장?)

# Supinator

- 기시: Lateral condyle of humerus; radial collateral ligament; annular ligament; supinator crest of ulna
- 종지: Lateral surface of radius – upper 1/3rd
- 기 능 : supinates forearm, especially when power not needed
- Spinal Levels: Innervation: C-(5),6 (radial) TS Line/Meric: N/A 배수혈:T-12/L-1







# Extensor Carpi Radialis Longus & Brevis

- Longus – 기시: Humerus-lateral supracondylar ridge - distal 1/3rd
- Longus – 종지: Dorsal surface of base of 2nd metacrpal - radial side
- Brevis – 기 시 : Humerus-lateral epicondyle (common extensor tendon); radial collateral ligament; deep antebrachial fascia
- Brevis – 종지: Dorsal surface of 3rd metacarpal
- 기 능 : Extends wrist; abducts wrist; stabilizes wrist for finger movements

# Extensor Carpi Radialis Longus & Brevis

- Spinal Levels: Innervation: C-(5), 6,7,8 (radial) TS Line/Meric: N/A 배수혈: L-4/5
- 기관: 우측 – Ileocecal valve; 좌측 – Houston valve (rectosigmoid folds)
- 경락: 신장
- 영양: N/A
- Chapman's Reflex: (Bilateral - Same as ICV / Houston valve) Ant #1: From the ASIS downward about three inches; Ant #2 area: From the point of the right shoulder downward about 2 or 3 inches; Post: C-3

# Extensor Carpi Radialis Longus & Brevis

- 임상 적응증:
- 주관절 문제 – lateral epicondylitis ("tennis elbow")
- 수완관절 신전 혹은 외전이 어렵다(통증, 가동범위 감소)
- Open ileocecal valve syndrome

# Extensor Carpi Ulnaris

- 기 시 : Humerus-lateral epicondyle (common extensor tendon); aponeurosis from posterior border of ulna; deep antebrachial fascia
- 종지: Base of 5th metacarpal – ulnar side
- 기 능 : Extends wrist; adducts wrist; stabilizes wrist for finger movements
- Spinal Levels: Innervation: C-(6),7,8 (radial) TS Line/Meric: N/A 배수혈: L-2/3

# Extensor Carpi Ulnaris

- 기관: 우측 – Ileocecal valve; 좌측 – Houston valve (rectosigmoid folds)
- 경락: 신장
- 영양: N/A
- Chapman's Reflex(Bilateral - Same as ICV / Houston valve) Ant #1: From the ASIS downward about three inches; Ant #2 area: From the point of the right shoulder downward about 2 or 3 inches; Post: C-3

# Extensor Carpi Ulnaris

- 임상 적응증:
- 주관절 문제
- 수완관절 신전 혹은 외전이 어렵다(통증, 가동범위 감소)
- Open ileocecal valve syndrome

Finger extensors (Extensor digitorum; Extensor Indicis; Extensor Digiti Minimi)

- Extensor digitorum – 기| 시| : Humerus-lateral epicondyle (common extensor tendon); deep antebrachial fascia
- Extensor digitorum – 종지| : Middle & disatl phalanges 2-5
- Extensor Indicis – 기|시|: Ulna-posterior surface (distal to origin of extensor pollicis longus); interosseus membrane
- Extensor Indicis – 종지| : index finger with extensor digitorum longus tendon

# Finger extensors (Extensor digitorum; Extensor Indicis; Extensor Digiti Minimi)

- Extensor Digiti Minimi – 기시: Humerus-lateral epicondyle (common extensor tendon); deep antebrachial fascia
- Extensor Digiti Minimi – 종지: Little finger with extensor digitorum longus tendon
- 기능: extend fingers
- Spinal Levels: Innervation: C-6,7,8 (radial) TS Line/Meric: N/A 배수혈: N/A

# Finger extensors (Extensor digitorum; Extensor Indicis; Extensor Digiti Minimi)

- 기관: 우측 – Ileocecal valve; 좌측 – Houston valve (rectosigmoid folds)
- 경락: 신장
- 영양: N/A
- Chapman's Reflex: (Bilateral - Same as ICV / Houston valve) Ant #1: From the ASIS downward about three inches; Ant #2 area: From the point of the right shoulder downward about 2 or 3 inches; Post: C-3

Finger extensors (Extensor digitorum; Extensor Indicis; Extensor Digiti Minimi)

- 임상 적응증:
- 수,완관절 신전 곤란(통증, 가동력감소)
- 수, 완관절 굴곡 곤란(통증, 가동력 감소)

# Flexor carpi radialis

- 기시: Medial epicondyle of humerus (common flexor tendon); deep antebrachia fascia
- 종지: Base of 2nd metacarpal; a slip to base of 3rd metacarpal
- 기 능 : wrist flexion; wrist abduction (slight); stabilizes wrist for finger movements
- Spinal Levels: Innervation: C-6,7,(8) (median) TS Line/Meric: N/A 배수혈: (T-12/L-1)

# Flexor carpi radialis

- 기관: N/A
- 경락: (위장)
- 영양: N/A
- Chapman's Reflex: (Bilateral) Ant: On anterior chest wall behind areola (*not* in the breast tissue); Post: Below inferior angle of scapula
- 임상 적응증:
- 주관절통 – medial epicondylitis
- 수완관절 통증, 굴곡시 약화

# Flexor carpi ulnaris

- 기 시 : Humerus-medial epicondyle (common flexor tendon); Ulna-medial margin of olecranon, proximal 2/3rds of posterior border; deep antebrachial fascia
- 종지: Pisiform; hamate; 5$^{th}$ metacarpal
- 기능: wrist flexion; wrist adduction (works with extensor carpi ulnaris); stabilizes wrist for finger movements
- Spinal Levels: Innervation: C-(7),8 (T-1) (ulnar) TS Line/Meric: N/A 배수혈:(T-12/L-1)

# Flexor carpi ulnaris

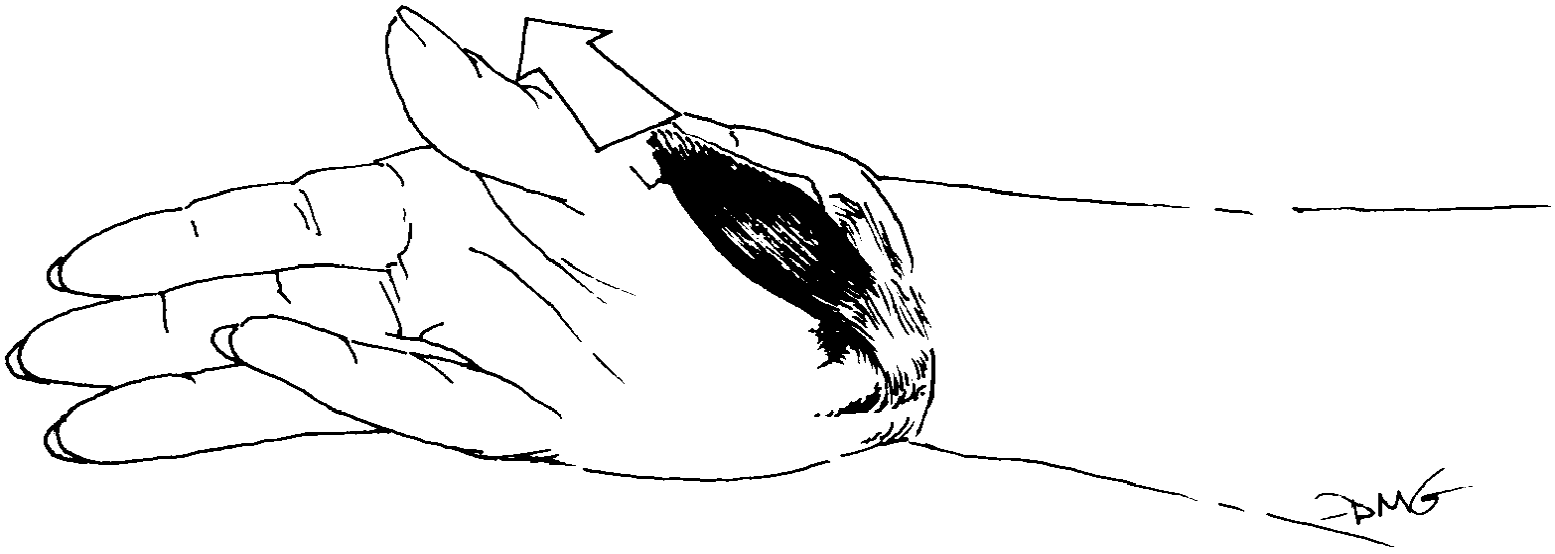
- 기관: N/A
- 경락: (위장)
- 영양: N/A
- Chapman's Reflex: (Bilateral) Ant: On anterior chest wall behind areola (*not* in the breast tissue); Post: Below inferior angle of scapula

# Flexor carpi ulnaris

- 임상적 적응증:
- 주관절통 – medial epicondylitis (“golf elbow”)
- 수완관절 통증, 굴곡시 약화

# Thenar muscle
# Opponens pollicus

- 기시: Flexor retinaculum; tubercle of trapezium bone
- 종지: Entire 1st metacarpal – radial side
- 기능: flexes & abducts (away from palm) the 1st metacarpal; slightly internally rotates thumb; causes opposition of the thumb toward the other fingers.
- Spinal Levels: Innervation: C-6,7 (median) TS Line/Meric: N/A 배수혈: T-12/L-1



# Opponens pollicus

- 기관: 위장
- 경락: 위장
- 영양: digestzyme
- Chapman's Reflex: (Bilateral) Ant: On anterior chest wall behind areola (*not* in the breast tissue); Post: Below inferior angle of scapula
- [Also reported as: (Bilateral) Ant: inferior to pubic bone; Post: L-5/PSIS]

# Opponens pollicus

- 임상적 적응증:
- Carpal tunnel syndrome
- 물건 잡기 힘들다
- 병뚜껑 열기 힘들다

# Carpal tunnel syndrome

# Differential diagnosis

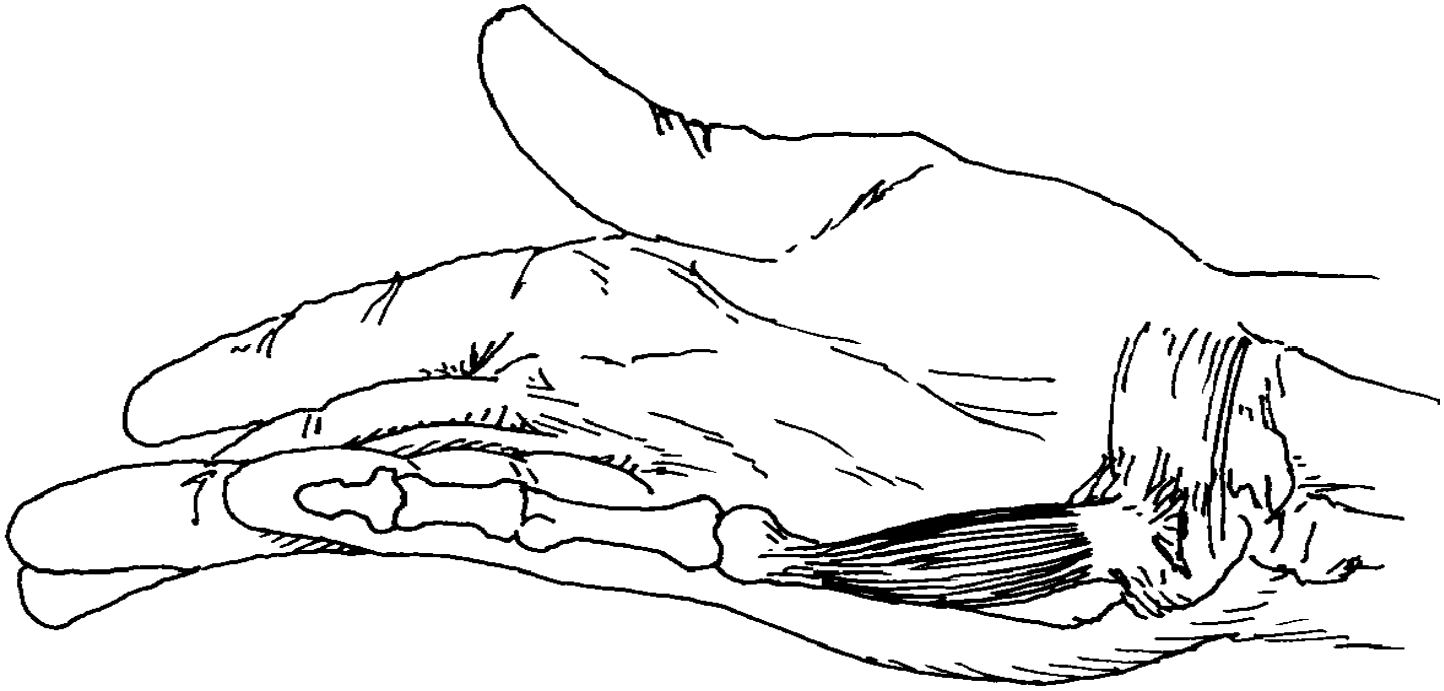
- Opponens pollicis/abductor pollicis brevis weakness
- Flexor digitorum strong
- Ulnar nerve muscle strong
  - Opponens digiti minimi
  - Flexor digiti minimi
  - Adductor pollicis
- Challenge and TL

# 치료

- Weak pronator quadratus-radius/ulnar separation
  - muscle origin/insertion
- Taping
- Nutrition-B6
  - Active form인 pyridoxal-5-phosphate가 되려면 마그네슘, 아연, riboflavin, phosphorus가 필요

# Opponens digiti minimi

- 기시: Hamulus (hook) of hamate bone; flexor retinaculum
- 종지: Entire 5th metacarpal shart – ulnar side
- 기 능 : flexes & slightly rotates the 5th metacarpal; helps to lift ulnar portion of hand so metacarpophalangeal flexors can bring little finger toward thumb (opposition); helps to cup hand
- Spinal Levels: Innervation: C-(7),8 T-1 (ulnar) TS Line/Meric: N/A 배수혈: T-12/L-1



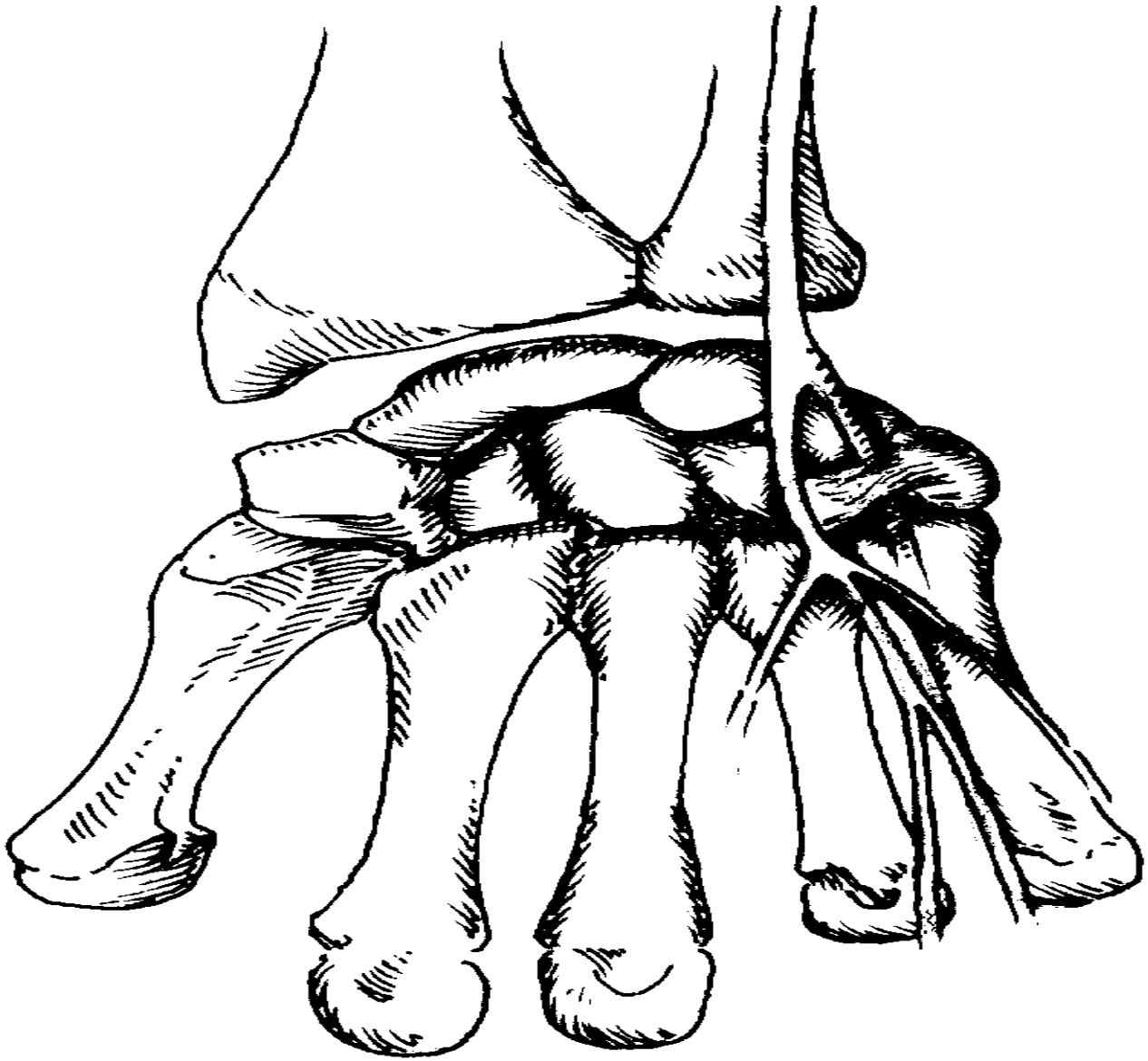
# Opponens digiti minimi

- 기관: 위장
- 경락: 위장
- 영양: Raw veal bone
- Chapman's Reflex: (Bilateral) Ant: On anterior chest wall behind areola (*not* in the breast tissue); Post: Below inferior angle of scapula (Also reported as: (Bilateral) Ant: inferior to pubic bone; Post: L-5/PSIS)

# Opponens digiti minimi

- 임상 적응증:
- Pisiform-hamate syndrome
- 약지를 쓰기 힘들다

# Pisiform hamate syndrome



# DDX

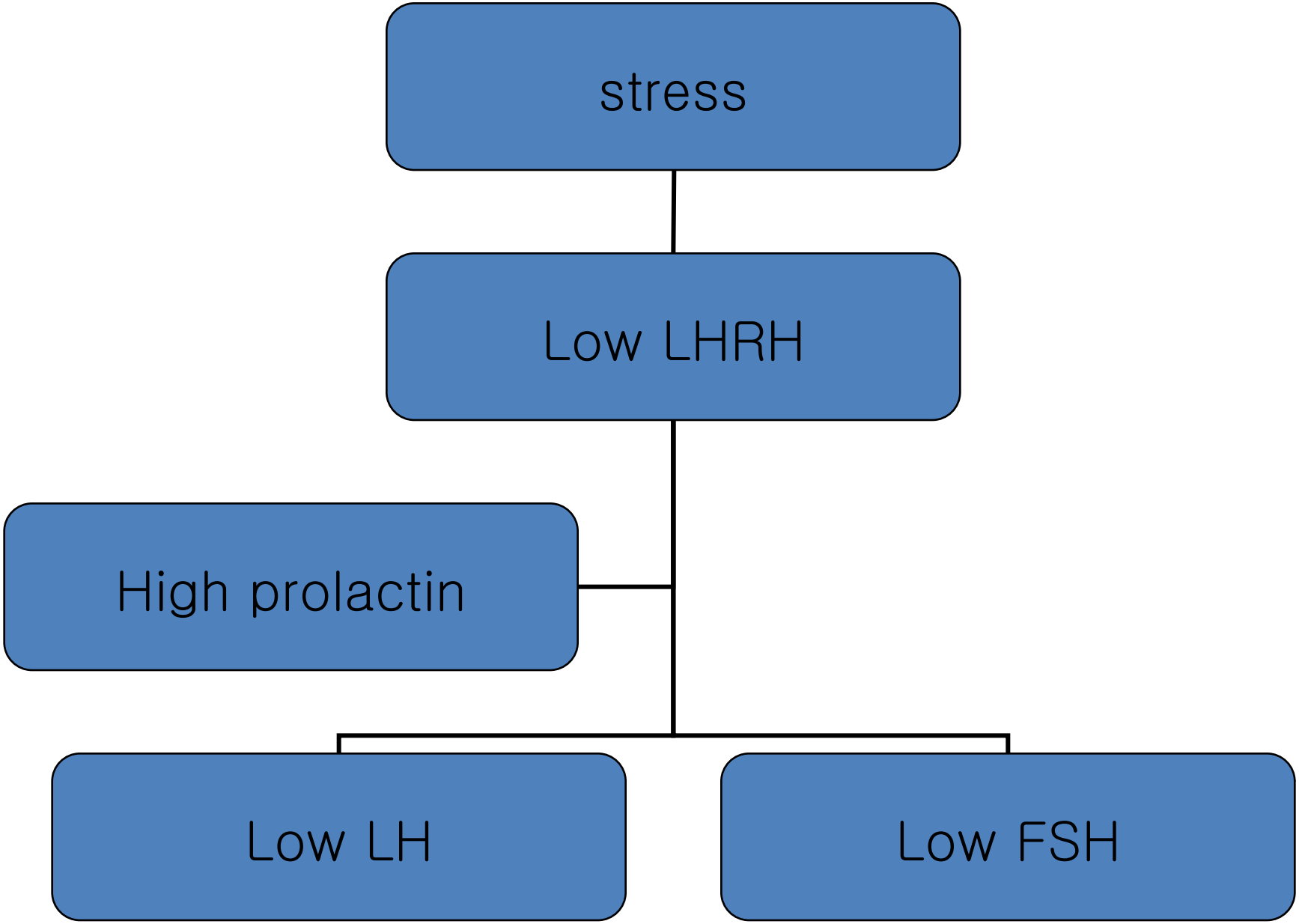
- Adductor pollicis and 1st dorsal interosseous weak
- Normal 4th, 5th flexor digitorum profundus

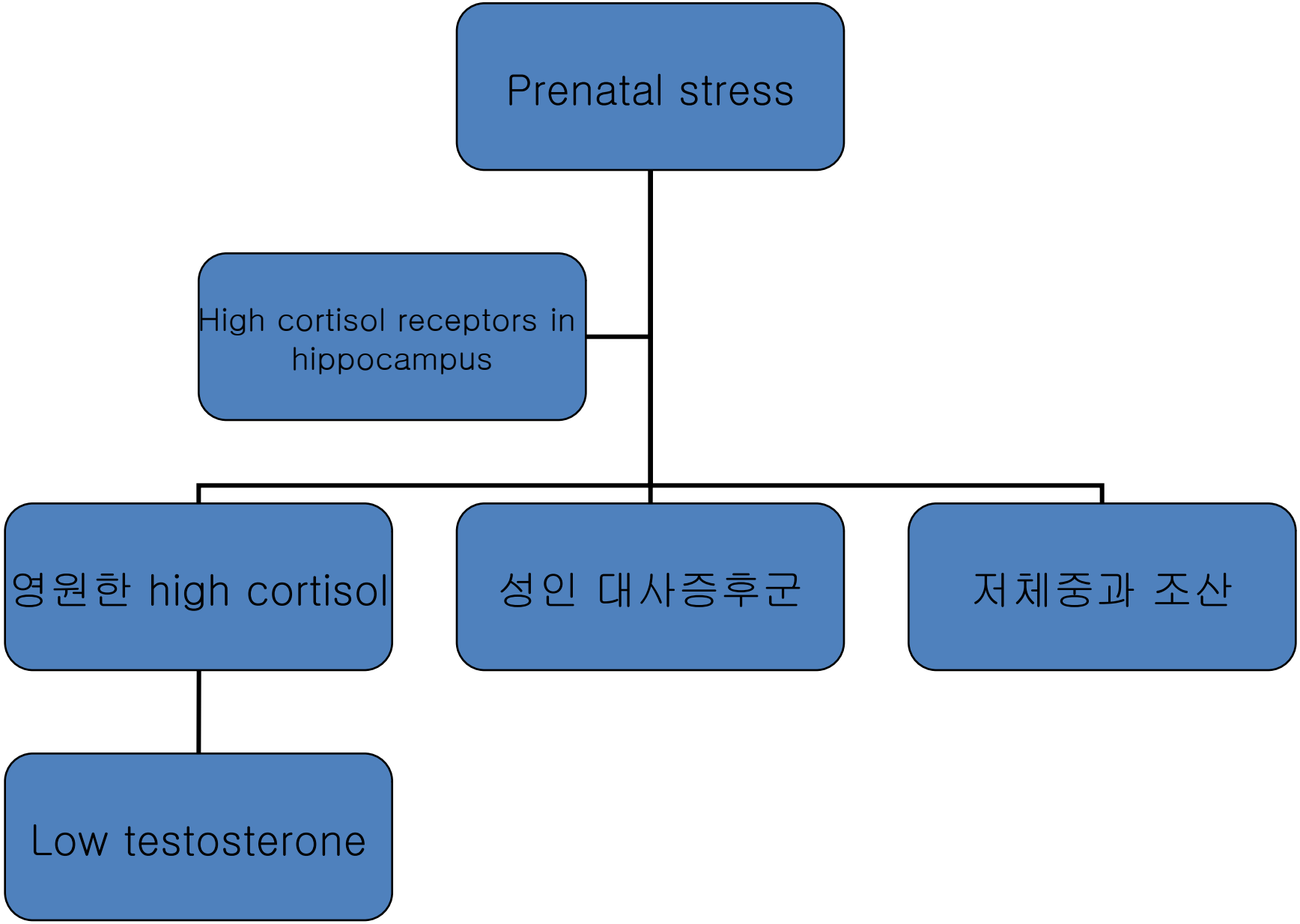
# Pisiform challenge

# Stress

- 교감신경-nor/epinephrine-anxiety, fear
- High Cortisol-depression
- High CRH-식욕억제
- High cortisol- 식욕증가

- 임신중 스트레스-교감신경흥분-저혈류량으로 인한 태아 저산소증-유산 혹은 조산


stress
Low LHRH
High prolactin
Low LH
Low FSH

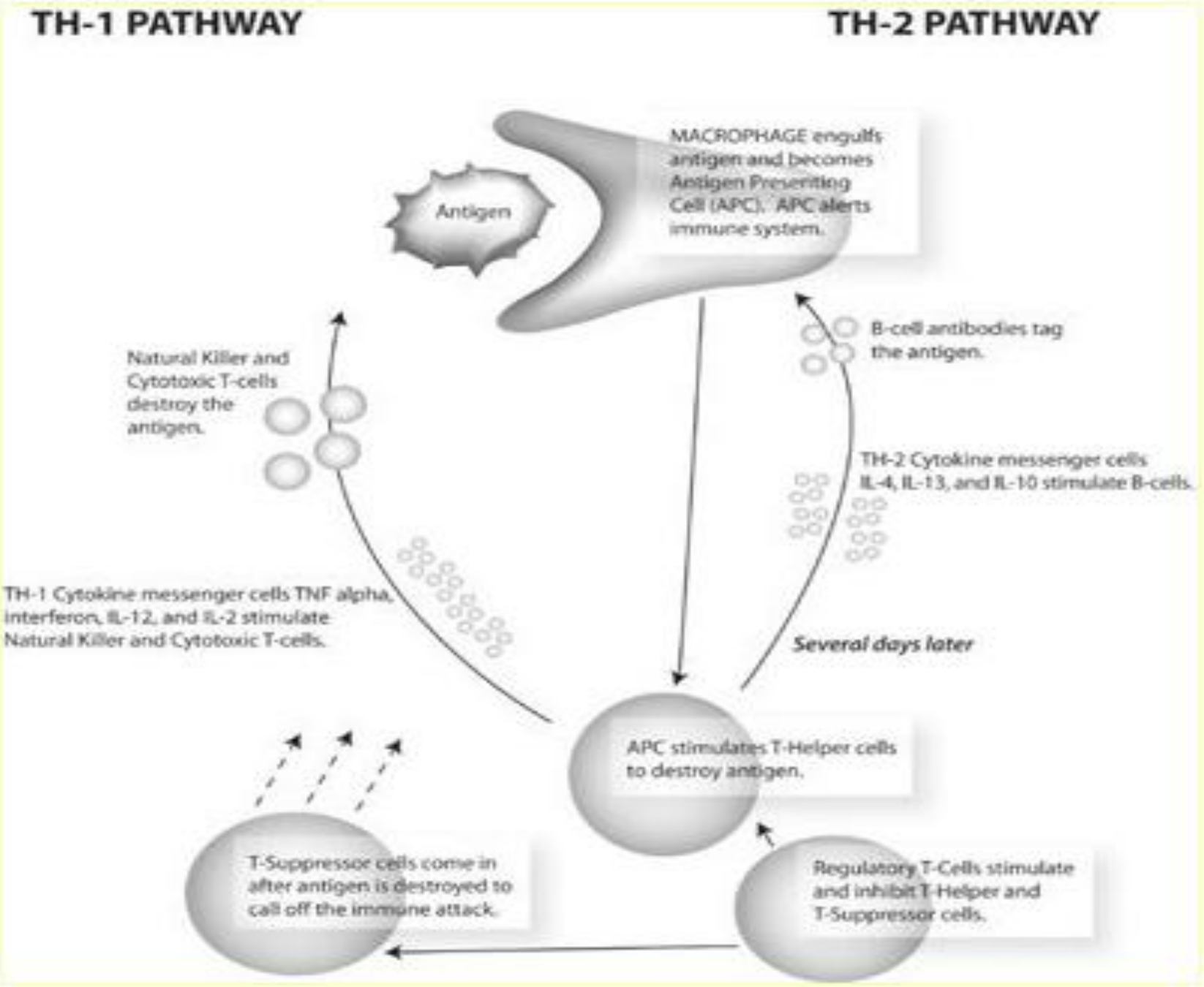

Prenatal stress
High cortisol receptors in hippocampus
영원한 high cortisol
성인 대사증후군
저체중과 조산
Low testosterone

# Prenatal Pro

- Vitamin A (as mixed carotenoids from palm) 5000 IU,
- Vitamin C (as Ascorbic Acid) 500 mg
- Vitamin D3 (as Cholecalciferol) 1000 IU
- Vitamin E (Total Natural Tocopherols) 250 mg, as d-gamma 158 mg, as d-alpha 16.75 mg/25 IU, as d-beta 3 mg, as delta 72 mg
- Vitamin K1 (as Phytonadione) 100 mcg
- Vitamin B1 (as Thiamine HCl) 50 mg,
- Vitamin B2 (as Riboflavin) 30 mg
- Vitamin B3 (as Niacinamide) 30 mg
- Vitamin B6 (as Pyridoxine HCl) 50 mg
- Folates (NatureFolate™ blend) 800 mcg
- Vitamin B12 (as Methylcobalamin) 500 mcg
- Biotin (as d-Biotin) 300 mcg
- Pantothenic Acid (as d-Calcium Pantothenate) 50 mg
- Iodine (as Potassium Iodide) 75 mcg
- Calcium (as DimaCal® Di-Calcium Malate) 450 mg
- Magnesium (as Di-Magnesium Malate) 200 mg
- Zinc (TRAACS® Zinc Glycinate Chelate) 20 mg
- Selenium (as Selenium Glycinate Complex) 200 mcg
- Copper (as TRAACS® Copper Glycinate Chelate) 1 mg, Iron (as Ferrochel® Ferrous Bisglycinate Chelate) 30 mg, Manganese (TRAACS® Manganese Glycinate Chelate) 3 mg, Chromium (TRAACS® Chromium Nicotinate Glycinate Chelate) 400 mcg, Molybdenum (as TRAACS® Molybdenum Glycinate Chelate) 100 mcg, Choline (as Choline Citrate) 100 mg,
- Inositol 100 mg, Grape Seed Extract 50 mg, Boron (as Boron Glycinate Complex) 1 mg

# OmegAvail™ Lemon Drop Smoothie
# 16 oz(454mg)


- Omega 3 Polyunsaturated Fat 2050 mg
- EPA (Eicosapentaenoic Acid) 1100 mg
- DHA (Docosahexaenoic Acid) 720 mg
- Other Omega-3 Fatty Acids 230 mg, Omega-6 Polyunsaturated Fat 295 mg, LA (Linoleic Acid) 65 mg, Other Omega-6 Fatty Acids 230 mg, Omega-9 Monounsaturated Fat 200 mg, Oleic Acid 190 mg, Other Omega-9 Fatty Acids 10 mg


TH-1 PATHWAY
TH-2 PATHWAY
Antigen
MACROPHAGE engulfs antigen and becomes Antigen Presenting Cell (APC). APC alerts immune system.
B-cell antibodies tag the antigen.
Natural Killer and Cytotoxic T-cells destroy the antigen.
TH-2 Cytokine messenger cells IL-4, IL-13, and IL-10 stimulate B-cells.
TH-1 Cytokine messenger cells TNF alpha, interferon, IL-12, and IL-2 stimulate Natural Killer and Cytotoxic T-cells.
Several days later
APC stimulates T-Helper cells to destroy antigen.
T-Suppressor cells come in after antigen is destroyed to call off the immune attack.
Regulatory T-Cells stimulate and inhibit T-Helper and T-Suppressor cells.

# TH-1 or TH-2 dominant?

- Too much natural killer and cytotoxic T cell activity: TH-1 dominant
  - TH-1 cytokines include: IL2, 12, TNFalpha, interferon
- Too much B cell activity: TH-2 dominant
  - TH-2 cytokines include: IL4, 13, 10
- 90% Hashimoto's are TH-1 dominant
  - Natural killer and cytotoxic T cell are overactive-attacking Thyroid

- Chronic viral infection, Type1 DM, MS—TH-1 dominant
- Asthma, dermatitis, chemical sensitivity, LUPUS-TH-1 dominant

# 하쉬모토 치료법

- Support T-regulatory cell-emulsi D3, DHA glutathione IV or cream
- TH-1 and TH-2 balance

- Remove antigen
- Restore immune barrier

## COMPOUNDS THAT STIMULATE TH-1[143] [144]

(These dampen a TH-2 dominance and will worsen the autoimmune condition of a TH-1 dominant person):

- Astragalus[145]
- Echinacea[146]
- Beta-glucan mushroom[147]
- Maitake mushroom[148]
- Glycyrrhiza (from licorice)[149]
- *Melissa officinalis* (lemon balm)[150]

## COMPOUNDS THAT STIMULATE TH-2[151]

(These dampen a TH-1 dominance and will worsen the autoimmune condition of a TH-2 dominant person):

- Caffeine[152]
- Green tea extract[153]
- Grape seed extract[154]
- Pine bark extract[155]
- White willow bark[156]
- Lycopene[157]
- Resveratrol[158]
- Pycnogenol[159]

## COMPOUNDS THAT MODULATE BOTH TH-1 AND TH-2[160]

- Probiotics[161] [162] [163] [164]
- Vitamin A[165] [166]
- Vitamin E[167] [168]
- Colostrum[169] [170] [171] [172] [173]

## COMPOUNDS THAT DAMPEN IL-1 ACTIVATING TH-1 OR TH-2[174]

- Boswellia[175] [176] [177] [178]
- Pancreatic enzymes
- Turmeric/Curcumin[179] [180] [181]

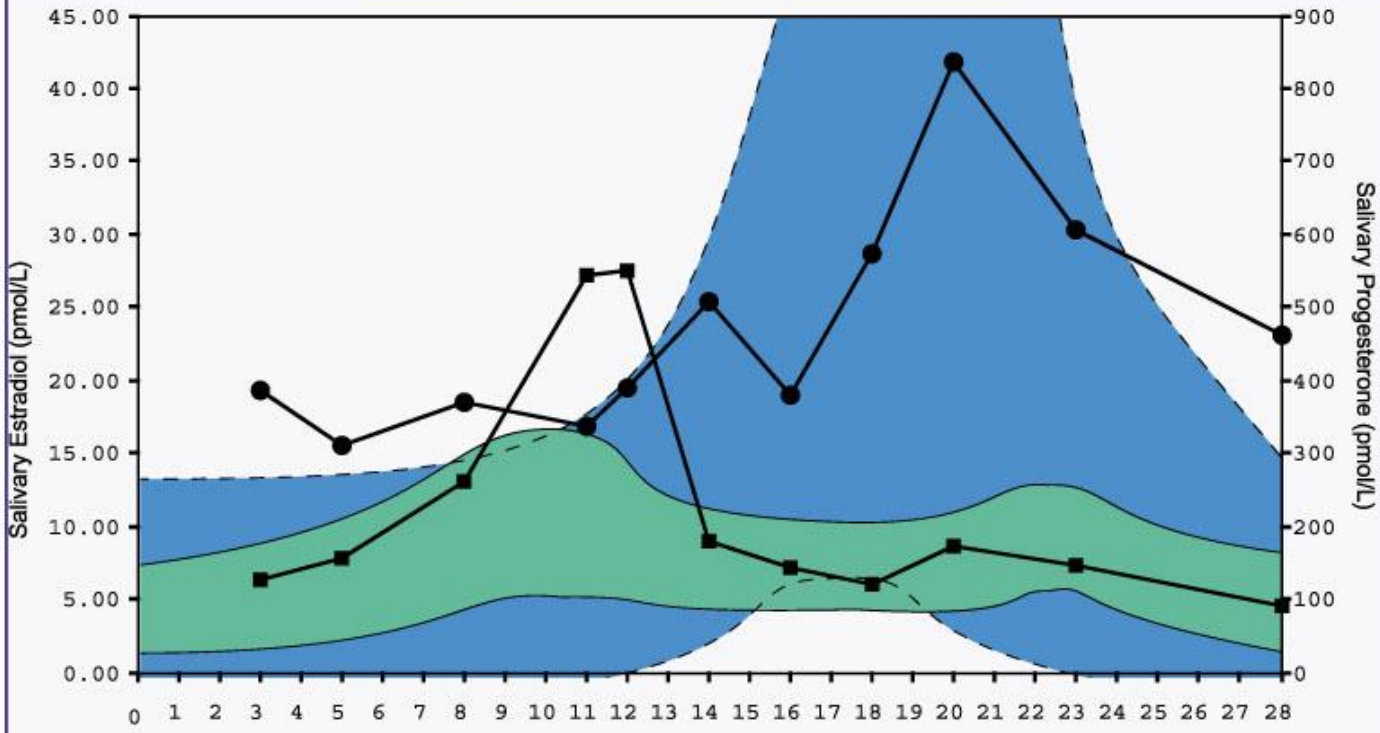
# HistaEze 알러지


- Vitamin C (as ascorbic acid) 500 mg
- Tinofend® (Tinosporia cordifolia) (stems) 900 mg
- Nettles Leaf (Urtica dioica) (leaves) 600 mg
- Quercetin 600 mg

- Bicarb Salts (as potassium bicarb 300 mg and
- sodium bicarb 300 mg) 600 mg
- Tinofend® contains a proprietary complex of
- Polysaccharides and polyphenols, and has been clinically shown to regulate key immune mediators and stimulate the activity of macrophages.
  *How does it work?*
  Tinofend® addresses the cause of allergies by increasing the number of phagocytic white blood cells, including macrophages, which help consume and rid the body of allergens, and by reducing the number of eosinophils (cells that contain histamine).

- **Bicarbonate salts**, which were added due to their role as immediate antihistamines, and their ability to mitigate the potential drowsiness experienced by those who may also be taking antihistamine medications.
- **Quercetin, Nettle leaf and Vitamin C**, which have been historically used throughout the years to help with the support and management of seasonal allergies.

## Salivary Estradiol and Progesterone Activity




| *Day of Cycle* | 3 | 5 | 8 | 11 | 12 | 14 | 16 | 18 | 20 | 23 | 28 | Avg. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Estradiol** | 6.35 | 7.86 | 12.99 | 27.10 | 27.44 | 8.89 | 7.13 | 5.99 | 8.65 | 7.39 | 4.53 | 11.30 |
| **Progesterone** | 385 | 309 | 370 | 338 | 388 | 506 | 380 | 574 | 835 | 607 | 460 | 468 |
| **P/E Ratio** | 61 | 39 | 28 | 12 | 14 | 57 | 53 | 96 | 97 | 82 | 102 | 58 |

**Patient's Estradiol**

**Estradiol Pattern**

**Patient's Progesterone**

**Progesterone Pattern**

**Estradiol Reference Ranges:**

**Follicular: 2.0 - 8.0 pmol/L**

**Midcycle: 6.0 - 17.1 pmol/L**

**Luteal: 5.5 - 13.2 pmol/L**

**Progesterone Reference Ranges:**

**Follicular: 53 - 193 pmol/L**

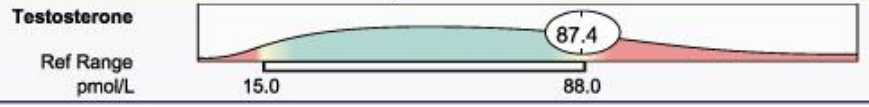
**Luteal: 142 - 522 pmol/L**

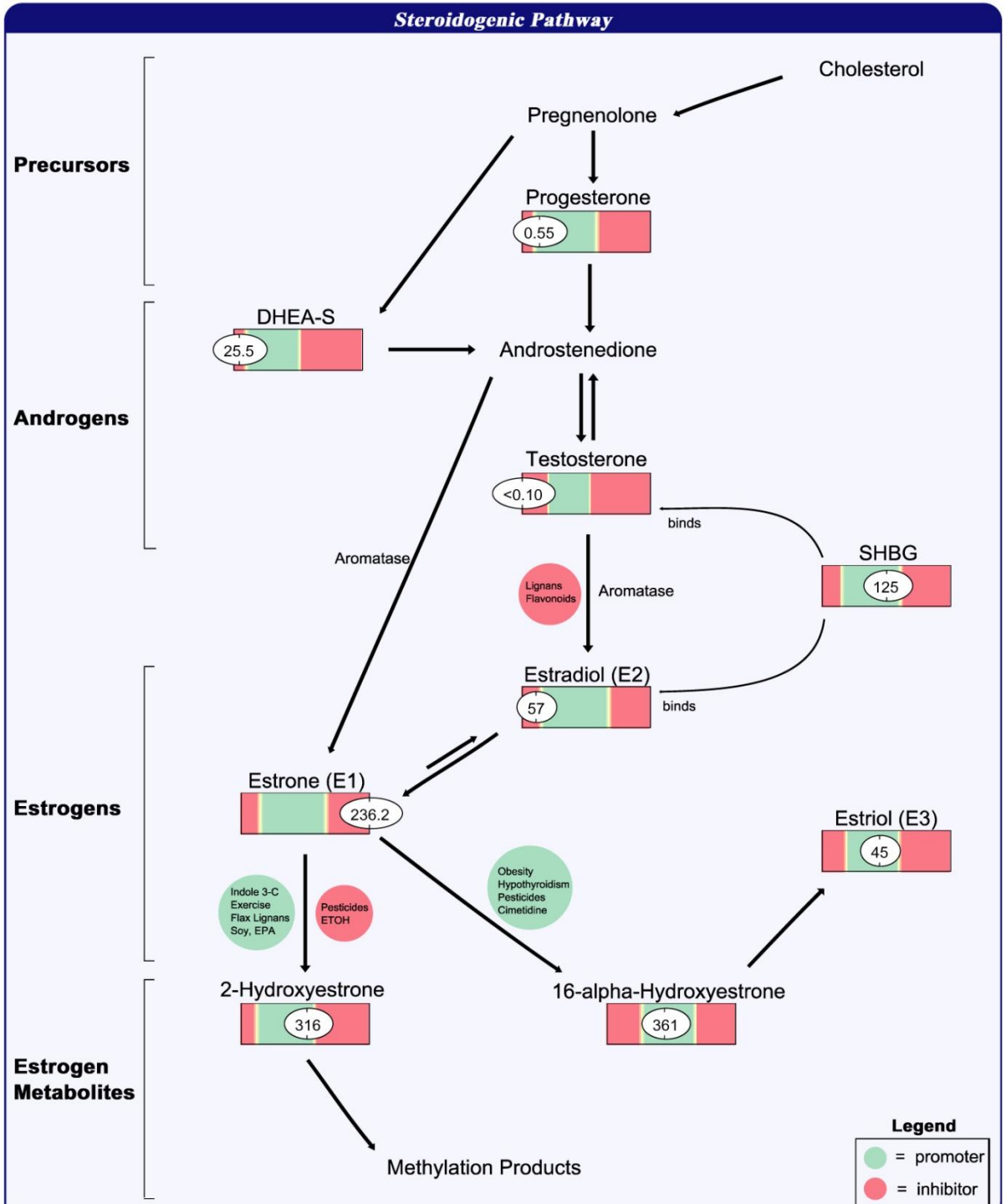
**Luteal Peak: 259 - 979 pmol/L**

**Ideal P/E Ratio: 10 -100 pmol/L**

This test was developed and its performance characteristics determined by GSDL, Inc. It has not been cleared or approved by the U.S. Food and Drug Administration.

## Salivary Testosterone




Steroidogenic Pathway
Precursors
Androgens
Estrogens
Estrogen Metabolites
Cholesterol
Pregnenolone
Progesterone
0.55
DHEA-S
25.5
Androstenedione
Testosterone
<0.10
binds
SHBG
125
Aromatase
Lignans
Flavonoids
Aromatase
Estradiol (E2)
57
binds
Estrone (E1)
236.2
Estriol (E3)
45
Obesity
Hypothyroidism
Pesticides
Cimetidine
Indole 3-C
Exercise
Flax Lignans
Soy, EPA
Pesticides
ETOH
2-Hydroxyestrone
316
16-alpha-Hydroxyestrone
361
Methylation Products
Legend
= promoter
= inhibitor

# Hydroxyestrones

- 2-hydroxyestrone
  - Weak estrogenic activity
  - The “good” estrogen
- 16$\alpha$-hydroxyestrone
  - Strong estrogenic activity
  - Binds covalently to estrogen receptors, conti nuously stimulating target tissues

# The Key Is Balance

- Low 2/16 ratio is associated with increased risk of estrogen-dependent conditions, such as breast cancer and lupus
- High 2/16 ratio is associated with increased risk of osteoporosis

# Factors Affecting Estrogen Metabolism

- Increased 2-Hydroxylation
  - Exercise
  - Intake of cruciferous vegetables (I3C), flax, soy, EPA
  - Estrogen replacement therapy
  - Thyroid hormone
  - Smoking
- Decreased 2- / Increased 16$\alpha$-Hydroxylation
  - Alcohol
  - Obesity
  - Cimetidine
  - Pesticide exposure

# Estrogen Metabolism Assessment (Serum)

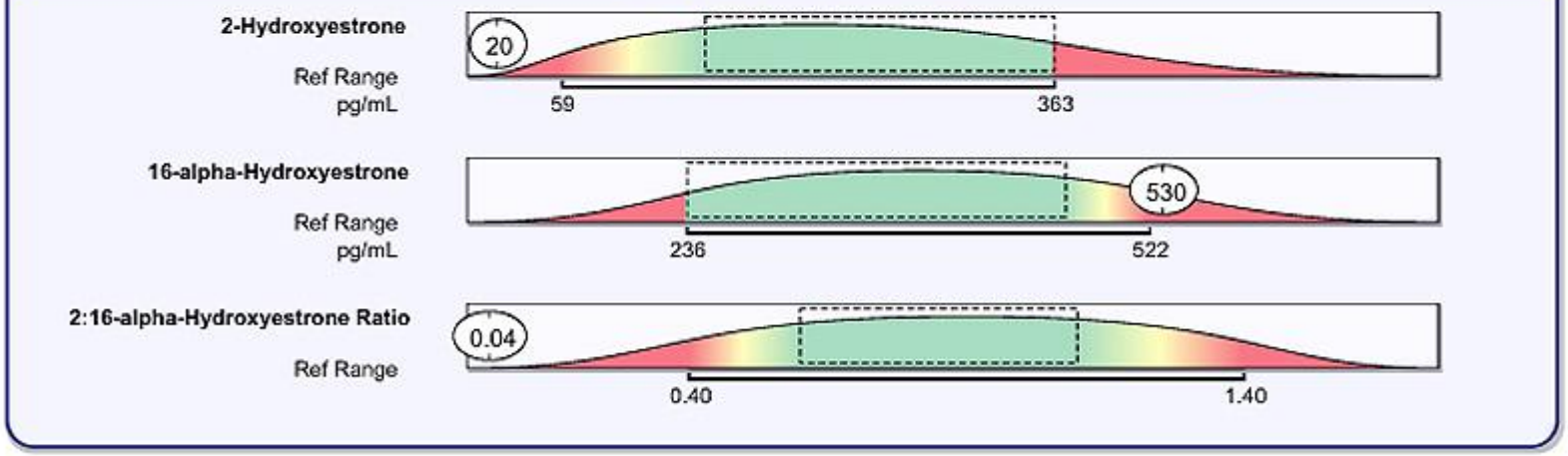
Great Smokies Diagnostic Laboratory℠
63 Zillicoa Street
Asheville, NC 28801-1074

Patient: **Sample Patient**

Age: 57
Sex: F
MRN:

**Order Number:**
Completed:
Received:
Collected:

## Estrogen Metabolism




## Estrogen Metabolism Index

- Research by the University of Surrey on the Foresight Programme followed the progress of 367 couples. The women ranged in age from 22-45 years, the men from 25-59 years. By the end of the study 89% of the couples had given birth. The average gestational age was 38.5 weeks. 42% of the babies were males whose average eight was 7lb 4.5 oz (3299g) and 58% were females whose average weight was 7lb 2oz (2368g). There were no miscarriages, perinatal deaths or malformations. No baby was admitted to Special Care.
- Upon coming to Foresight 41% of couples had had no previous adverse reproduction history, but among these were the older couples. 37% had a history of infertility, 38% had a history of previous miscarriage, 11% had had a therapeutic abortion, 3% had suffered a stillbirth, 15% had had small for dates babies or low birth weight babies and 2% had had babies with a malformation. 70% of the mothers were primigravida; 30% multigravida having 1-3 children.
- 60% of the women drank alcohol, and 57% of them smoked. 90% of the men drank alcohol and 45% of them smoked. Approximately 2% admitted smoking cannabis mostly in the past.
- Of the couples coming to foresight with no history, 96% had given birth by the end of the study. The following problem groups had also given birth by the end of the study with these percentages:
- Past Infertility:- 81%
  Past Miscarriage:- 83%
  Past Therapeutic Termination:- 73%
  Past Stillbirth:- 80%
  Past Small-for-dates or Malformation:- 100%

- 1. Nutrition
  2. Tobacco, alcohol, street drugs and certain medications
  3. Food Additives
  4. Food Allergies and / or Malabsorption
  5. Organophosphate Pesticides and other Hazardous Substances
  6. Drinking Water
  7. Mineral analysis, toxic metals and supplementation
  8. Contraception
  9. Genitourinary infections
  10. Other areas of concern (eg: Electromagnetic radiation and infestation)

# Sex Hormone Balance

# Low estrogen priming index

- Physical, mental depression
- Loss of short term memory
- Lack of motivation and drive
- Vaginal dryness and thining of the vaginal walls
  - Painful sex
  - Loss of libido
- Dry skin,Shrinkage of breast tissue
- Urinary tract infection, incontinence
- Blood sugar disorder, osteoporosis…

# High estrogen index

- Breast cancer
- Endometrial cancer
- Endometriosis
- Gallbladder disease
- Autoimmune disease
- Same sx like low estrogen-hot flash, depression, migraine
  - Due to estrogen receptor down-regulation caused by increased estrogen exposure that induce a low estrogen phenotype

# FSH Surge

- FSH is released by the pituitary when estrogen and progesterone levels fall in the luteal phase
- The job of FSH is to stimulate the follicle to produce adequate amounts of estrogen during the first half of the cycle
- If FSH surge is not adequate, it may not allow a follicle to mature and release proper amounts of estrogen.-pituitary dysfunction
- May be caused by HRT, BCP
- Abnormal FSH surge will take place when hormones(estrogens) do not drop appropriately in the luteal phase of the previous cycle

# LH surge

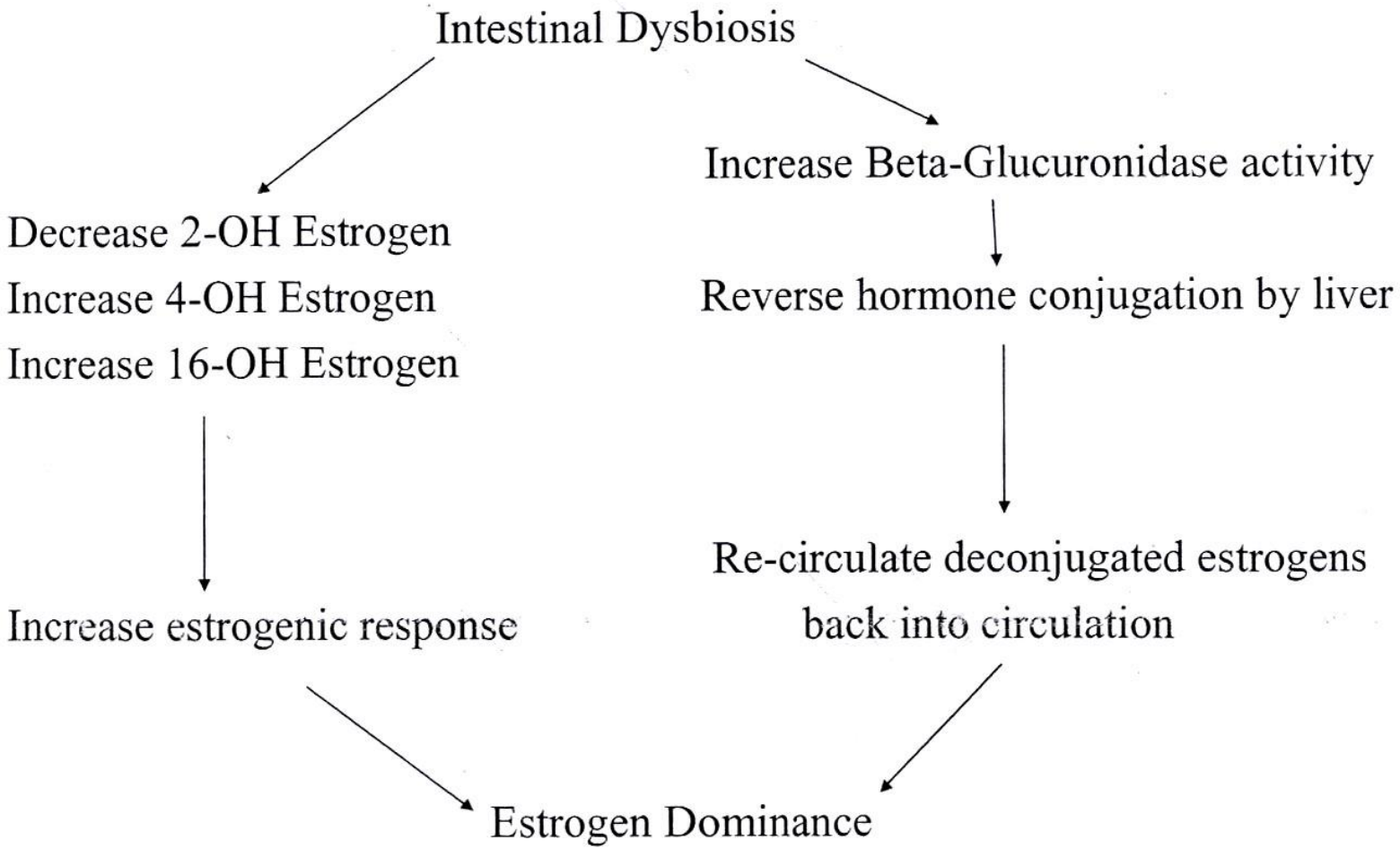
- LH is released by pituitary during the midcycle when estrogen levels become elevated enough from follicular phase FSH stimulation on the ovaries to induce this positive feedback loop.
- LH then induce ovulation
- LH levels stimulate the corpus luteum during the luteal phase of the cycle to release progesterone
- LH:
  - initiate ovulation
  - Stim progesterone from corpus luteum

- Cortisol suppress the LH release
- Adrenal stress suppress ovulation or create luteal phase defects due to suboptimal LH release

# Sex Hormone Balance

- Female sex hormone balance:
- Estrogen dominance in women:
  - Improve phase I / II liver function with aminoDtox, LVGB, antioxidant
  - Balance progesterone with Chaste Tree(femguard+balance)
- Menopause and post menopause
  - Improve endogenous production of estrogen and progesterone with herbs that contain steroidal saponins (Tribulus, wild yam, false unicorn root, black cohosh)
    - Wild yam complex + tribulus tablets
  - These herbs interact at a hypothalamic level to balance hormones.

# Estrogen Dominance and GI Dysfunction



# Sex Hormone Balance

- Male sex hormone balance
  - Improves endogenous testosterone production with Tribulus
  - Normalize the conversion of testosterone by regulating the enzyme alpha-5-reductase
    - Prevents male pattern baldness and prostatic hyperplasia.
    - Herbs include saw palmetto and nettle root.
    - Nutrients include zinc, B6, omega-6 EFA's
      - Zinc liver chelate, cataplex B, blackcurrant seed oil peries / EPO capsules.

# Tribulus

- Effects:
  - Tribulus saponins appears to increase FSH in pre-menopausal women which in turn increase levels of estradiol.
  - In the postmenopausal women Tribulus saponins, by binding with (but only weakly stimulating) vacant receptors in the hypothalamus, may convince the body that there is more estrogen than there actually is present.
  - Increase the production of growth hormone

# Chaste Tree

- Rationale:
  - Chaste Tree is a prolactin inhibitor, dopaminergic agonist, and is indirectly progesterogenic.
  - Research has shown that Chaste Tree extracts and some phytochemicals within it, particularly the diterpenes, are dopaminergic i.e. Chaste Tree enhances the activity of dopamine, which inhibits excessive prolactin secretion from the anterior pituitary.

# Chaste Tree

- Indications:
  - Premenstrual syndrome, especially premenstrual mastalgia, fluid retention and premenstrual aggravations (e.g. mouth ulcers, orofacial herpes)
  - Menstrual disorders: amenorrhea, metrorrhagia, oligomenorrhea, polymenorrhea (related to pituitary dysfunction)
  - Endometriosis and fibroids
  - Infertility due to decreased progesterone levels or hyperprolactinemia.
  - Acne (both men and women)
  - Benign prolactin hyperplasia (BPH)

여성호르몬을 처방 받아서 복용하는 분이 심혈관 장애나 뇌혈전증 유방의 섬유낭종 자궁질환을 걱정해서 호르몬을 중단하고자 하신다면 다음의 절차를 밟는 것이 좋습니다.
처방 받은 복용하던 여성호르몬을 갑자기 중단하게 되면 몸에 문제가 생길수도 있기 때문입니다.

<첫 단계: 1-6주>
내추럴 영양제와 호르몬-Wild Yam Complex, SymplexF, Tribulus를 복용하기 시작하면서 처음 6주간은 처방 받은 여성호르몬과 함께 복용합니다.

<두번째 단계: 7-12주>
6주를 마치면 다음 6주간은 처방 받은 여성호르몬을 반으로 줄입니다. 영양제는 계속 복용합니다. Phyto B(내추럴 에스트로젠 프로제스테론 호르몬)를 추가해서 함께 복용합니다. 아침 기상시, 저녁 취침 전 각각 한 알씩을 깨물어서 녹여 드시면 됩니다.

<세번째 단계: 13-18주>
13주 차에는 처방 받은 여성호르몬의 1/4만 복용하면서 영양제를 계속 복용합니다. Phyto B는 아침 저녁 두 알씩으로 증량합니다.

<마지막 단계: 19주>
처방 받은 여성호르몬은 완전히 끊고 영양제만 계속 복용합니다.
Phyto B는 계속 아침 저녁 두 알씩 복용합니다.

몸의 상태나 증상이 개선되기 시작하면 영양제는 반으로 줄여서 복용합니다.

* Wild Yam Complex, SymplexF, Tribulus는 모두 내추럴 여성호르몬 보조치료제이면서 자궁 등 비뇨생식기관을 보호해줍니다. 갱년기 장애로 인한 얼굴 조열감, 다한증, 질건조증 등에도 도움이 되며 호르몬 부족으로 인해 질이 건조한 경우데도 효과적입니다. 이 경우는 cranberry complex를 함께 복용하시는 것이 좋습니다.
만일 성욕, 리비도가 감퇴되어 있으시면 Libido-F를 복용하시는 것이 좋습니다.
스트레스를 너무 많아서 부신기능이 고갈되어 있는 경우엔 adrenal complex를 병행합니다.
자궁근종이나 내막증 난소낭종 등의 문제가 함께 있는 경우엔 전문의와 상담을 하셔야 합니다. 호르몬 조절을 원활하게 해주는 FemGuard+Balance가 효과적인 경우도 많습니다. 특히 생리전 증후군, 폐경기전 증후군 등에 도움이 됩니다.

# Saw palmetto/Nettle root

**maximum urinary flow, a 29% increase in mean urinary flow, a 45% reduction in residual urine, a 50% reduction in Nocturia, a 62% reduction in Dysuria and a 53% decrease in post-void dribbling in Enlarged Prostate patients.**

**Inhibits the *aromatase and 5-alpha reductase* enzymes.**

**Inhibits the transformation of the benign cells involved in Enlarged Prostate to the malignant Cells involved in Prostate Cancer.**

Inhibits the binding of DHT to Prostate cells thereby preventing DHT from stimulating the proliferation of Prostate cells that leads to Enlarged Prostate.

Inhibits the binding of Testosterone to Sex Hormone Binding Globulin (SHBG), resulting in lower levels of "bound" Testosterone and higher levels of "free" Testosterone, this effect occurs as a result of Nettle binding to SHBG in place of Testosterone.

# Chase berry


Chaste Berry may mimic the ability of Luteinizing Hormone (LH) to stimulate the production of Progesterone in the Corpus Luteum during the Luteal Phase of the Menstrual Cycle.
Some studies have shown that Chaste Berry also stimulates the actual secretion of LH.

Maca
Is claimed by various authors to increase Testosterone levels by increasing spermatogenesis
Therapeutic dose of 1,500-4,000mg per day.

Tribulus terrestris is speculated to enhance the conversion of Androstenedione to Testosterone.
It is speculated that this conversion occurs under the influence of LH which Tribulus terrestris is claimed to increase production of.

# DIM

Indole-3-Carbinol stimulates the endogenous production of Glutathione by hepatocytes.

Indole-3-Carbinol facilitates the binding of various substances (including carcinogens) to Glucuronic Acid to form Glucuronides for excretion.

Indole-3-Carbinol inhibits the conversion of Estrone to 16-Hydroxyestrone (a carcinogenic metabolite of Estrone).

And redirects Estrone to be converted to 2-Hydroxyestrone (a safe metabolite of Estrone).

# Prenatal twice daily essential packet

- Twice Daily Multi (1 capsule per packet)
  OsteoForce (2 tablets per packet)
  Ferrochel® (1 capsule per packet)
  Omega Ultra Marine (1 softgel per packet)

# FemGuard+Balance

classic herbal hormonal balancing in the form of Vitex, polygonum and black cohosh, along with DIM and chrysin for protection

optimization of beneficial estrogen aromatase activity.

Calcium-d-glucarate promotes the proper elimination of excess estrogens.

- Rosemary, resveratrol, grape seed extract, and EGCg from green tea are included for maximum antioxidant protection.
- Vitamins B6, B12, and folic acid promote proper cell differentiation, including those of the cervix.
- Magnesium and calcium are also included.

- Vitamin B6 30 mg
  (as Pyridoxine HCl and Pyridoxyl-5-phosphate)
-
- Folic Acid 400 mcg

- Vitamin B12 (as Methylcobalamin) 400 mcg
-
- Magnesium 50 mg
  (as Di-Magnesium Malate, Buffered Glycinate Chelate)
- Calcium D-Glucarate 200 mg

- Calcium 100 mg
  (as Di-Calcium Malate, Bis-Glycinate Chelate)
- Black Cohosh (*Cimicifuga racemosa*) (root) 100 mg

- Chaste Berry Extract (*Vitex agnus castus*) 100 mg

- Turmeric (*Curcuma longa*)(rhizome) 50 mg
- Rosemary Extract (*Rosemarinus officinalis*) (leaves) 50 mg
- Resveratrol (*Polygonum cuspidatum*) (root) 20 mg
- Grape Seed Extract (*Vitis vinifera*) 25 mg
- Catethin™ Green Tea Extract (*Camellia sinensis*) 100 mg
- BioResponse DIM ® 30 mg
  Chrysin 200 mg

# OvexP

- 난소의 기능을 돕고 여성호르몬의 균형을 잡아주는 영양제입니다. 불임인 경우 보통 프로제스테론 호르몬이 부족한 경우가 많으므로, ovexP와 FemGuard를 통해 난소의 기능을 활성화 하고 황체호르몬을 자극함으로써 원활한 호르몬 균형을 맞추면 임신의 가능성은 높아질 수 있습니다.

# ProgonB

- 내츄럴 프로제스테론
- 불임인 경우 대부분 프로제스테론 부족인 경우가 많으므로 이 제품을 배란 후부터 다음 생리시작 전까지 복용한다
- 임신이 될 때까지 매달 반복
- 갱년기 증후군인 경우 프로제스테론이 부족할 때도 있습니다.
-

# Progon-B
# Oral Pellets

## *Oral equivalent of Progonol*


100 mgs of progesterone per 8 pellets

**Ingredients:** Barbasco Extract, Dioscores quat. Extract (fermented, standardized), Crataegus oxycontha Extract, Vitamin B-6, Avena Sativa, Prunus spp. Extract in a pellet base of Lactase and Lactose. Contains “Active” Wild Mexican Yam From Dioscorea and Standardized Progesterone (Micronized) Chemically Bio-Identical To That secreted from our Ovaries.

**Directions as a dietary herbal supplement for Menopause or Perimenopause:** Use 4 pellets twice a day, a total of 8 per day. Crack the pellets with your teeth and chew for 2-3 seconds, then let dissolve under your tongue for 3-5 minutes. If taste is too bitter for you, swallow, OR you may insert the pellets into your vagina.

**Directions as a dietary herbal supplement for PMS:** Use Day 12-26 of your menstrual cycle. Please count the first day of your period as Day 1 (one) of your cycle. Use 4 pellets twice a day, a total of 8 per day. Crack the pellets with your teeth and chew for 2-3 seconds, then let dissolve under your tongue for 3-5 minutes. If taste is too bitter for you, swallow OR you may insert the pellets into your vagina. Do not use if you are allergic to milk products. Not for “Lactose Intolerant.”

**Try Our Progon-B Nutritional Herbal Phyto-Progesterone oral pellets to maintain good health during PMS, Perimenopause, Menopause and Osteoporosis**

# Phyto-B
# Oral Combination Pellets

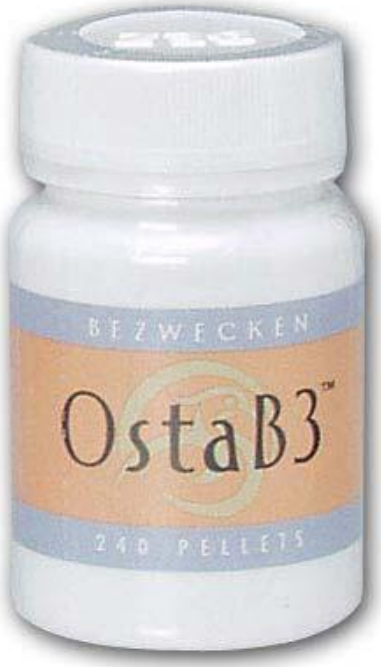
## Nutritional Herbal Support for Menopause and Perimenopause


2mgs of estrogen ( 20%=E2 and 80% E3) 65mgs of Progesterone per 8 pellets a day

**Ingredients:** Extracts of Barbasco, dioscorea quai, soybean, licorice root, crataegus oxycantha, medicago sativa, Camellia sinensis, Similax aristolochiaefolia, avena sativa, prunus spp, and Lactase. Do not use if allergic to milk products as it may cause nausea or vaginal itching.

**Directions:** Use 4 pellets twice a day, a total of 8 per day. For maximum absorption, crack the pellets and chew for 2-3 seconds, then let dissolve under tongue (usually 3-5 minutes.) If taste is too bitter for you, swallow, OR you may insert the pellets into your vagina. Should not be used by women with a history of breast disease.

# Osta B3
# Oral Pellets
# Nutritional Herbal Support for Menopause and Perimenopause




PHYTO-PROGESTERONE (65mgs) AND PHYTO-ESTROGEN (ESTRIOL ONLY=2mgs) in 8 pellets daily
OK for women with a history of breast disease. This product may also be used intra-vaginally.
**Strength:** This is not a tri-estrogen product. Osta B3™ is formulated with the herbal phyto-estrogen which mimics “estriol” Only. 100% Estriol.

**Ingredients:** Barbasco Extract, Dioscores quat. Extract, Crataegus oxycantha Extract, Medicago saliva Extract, Soybean Extract, Licorice Root Extract, Smilax aristolochiaefolia Extract, Avena Sativa, Prunus spp. Extract, all in a pellet base of Lactose and Lactase (fermented, standardized). Not for Lactose Intolerant!

**Directions:** Use 4 pellets twice a day, a total of 8 per day. For maximum absorption, crack the pellets and chew for 2-3 seconds, then let dissolve under tongue, usually 3-5 minutes. If taste is too bitter for you, swallow, OR you may insert the pellets into your vagina. Do not use if you are allergic to milk products.

# Wild yam complex

- 갱년기 증후군(얼굴 조열감, 다한증, 불안 불면증, 의욕저하, 피로, 질건조증, 소변빈삭)

- 여성 호르몬 조절과 생리전 증후군(생리통, 생리불순, 우울증 등)
- Wild Yam, Black Cohosh, Shatavari, Korean Ginseng, St John s Wort, Sage.

# Wild Yam Complex

- Rationale:
- The unique, combined action of these herbs assists in the treatment of menopausal disorders by:
    - Helping the body to adapt to new hormonal levels.
    - Act as a tonic to the nervous system and antidepressant.
    - Reduce excessive perspiration and hot flahses.

# Wild Yam Complex

- Indications:
  - Menopausal conditions, including excessive perspiration, hot flashes, associated depression
  - PMS, in conjunction with Chaste Tree tablets with symptoms of PMS-D
    - Symptoms: crying spells, depression, fatigue.

- Wild Yam root & rhizome 4:1 extract
  from *Dioscorea villosa* root & rhizome 400 mg100 mg
- Shatavari root 4:1 extract
  from *Asparagus racemosus* root 400 mg100 mg
- St John's Wort herb flowering top 6:1 extract
  from *Hypericum perforatum* herb flowering top
  600 mg
  Containing hypericins 300 mcg100 mg
- Sage herb 5:1 extract
  from *Salvia officinalis* herb 290 mg58 mg
- Black Cohosh root 5:1 extract
  from *Cimicifuga racemosa* root 100 mg20 mg
- Korean Ginseng root 5:1 extract
  from *Panax ginseng root* 75 mg
  Containing ginsenosides as Rg1 & Rb1 1.3 mg

# SymplexF

- Symplex F is a special combination formula containing Protomorphogen™ extracts from bovine ovary, adrenal, pituitary, and thyroid glands.

# tribulus

1)support normal reproductive function in men and women
2)support normal hormone production in men and women
3)promote vitality and stamina
4)support physical endurance
5)promote an overall feeling of well-being

# LibidoStim-F

- LibidoStim-F is a complex formulary blend of nutraceutical and herbal ingredients for the increase of female sexual desire and pleasure. The combination of wild yam, damiana, standardized tribulis, epimedium (horny goat weed), red clover, urtica dioca, Korean ginseng, deer antler, gingko biloba, DIM, and DHEA provide safe enhancement for natural testosterone production, optimization of testosterone and estrogen metabolism, an increased blood flow, and adrenal support. This product is designed to help provide an overall increase in desire and sexual satisfaction specifically for women.
-

- Helps safely promote female sexual desire.
- Provides a natural and safe enhancement of testosterone.
- Favorably influences aromatase activity for optimal testosterone and estrogen metabolism.
- Natural optimization of blood for enhanced sexual function.

- Wild Yam (*Dioscorea villosa*)(root) 200 mg [standardized to contain 2.5% diosgenin]
- Damiana (*Turnera aphrodisiaca*)(10:1) 200 mg
- Tribulus (*Tribulus terrestris*)(aerial) 200 mg [standardized to contain 20% steroidal saponins]
- Chinese Ginseng (*Panax ginseng*) (root) 200 mg [standardized to contain 10% ginsenoside]
- Red Clover (*Trifolium pratense*)(dried blossoms) 100 mg [standardized to contain 8% isoflavones]
- Nettle Leaf (*Urtica dioica*) 100 mg
- Deer Antler (*Cervus nippon antler*) 100 mg
- Ginkgo (*Ginkgo biloba*) 100 mg [standardized to contain 24% ginkgo flavone glycosides and 6% terpene lactones]
- Horney Goat Weed (*Epimedium grandiflorum*) 100 mg [standardized to contain 40% icariins]
- DIM (Diindolylmethane) 100 mg
- Phosphatidyl Choline 100 mg
- DHEA (Dehydroepiandrosterone) 10 mg

# LibidoStim - M

- This unique product provides a blend of nutraceutical and herbal ingredients for the enhancement of male sexual desire and erectile function. The combination of *LongJax™ (E. longifolia), tribulis, epimedium (horny goat weed), Peruvian maca, muira, saw palmetto, and coleus* provide safe support for natural testosterone production, elevation in cAMP production to enhance erectile function, in order to promote an overall increase in desire.
- *DIM* and *chrysin* have been included to safely manage increased testosterone levels by favorably influencing aromatase activity.
- *Arginine* and *gingko biloba* provide enhanced blood flow for enhanced performance and enjoyment, particularly when used as part of the Designs for Health comprehensive male enhancement protocol.

# Prostate Supreme

- Prostate Supreme provides a balanced and comprehensive support for optimal prostate health and function.
- This formulation promotes a healthy testosterone to dihydrotestosterone (DHT) balance, favorable aromatase activity to limit the conversion of testosterone to estradiol (found to cause prostate tissue proliferation and BPH), supports optimal bladder function, and it provides targeted nutritional and antioxidant support to rejuvenate the prostate and maintain health prostate health.

- Vitamin B6 (as Pyridoxine HCl) 10 mg
- Zinc (as Zinc Chelazome® Bis-Glycinate Chelate) 10 mg
- Copper (as Copper Chelazome® Bis-Glycinate Chelate) 500 mcg
- Whole berry Saw Palmetto Powder 400 mg
- Saw Palmetto (*Serenoa repens*)(berry) 300 mg [standardized to contain 45% Fatty Acids]
- Pygeum (*Pygeum africanum*)(bark) 100 mg [standardized to contain 25% Phytosterols]
- Nettle (*Urtica dioica*)(leaves)(20:1) 100 mg
- L-Glycine 100 mg
- L-Alanine 100 mg
- L-Glutamic Acid 100 mg
- Fractionated Pectin 100 mg
- Pumpkin Seed (*Cucurbita pepo*) (seed)(20:1) 60 mg
- Lycopene 20 mg
- Chrysin 20 mg

# 난소낭종PCOS

- insulin resistance
- HPA axis becomes weakened (as a result of chronic stress), insulin sensitivity becomes heightened, adversely affecting the ovaries and thyroid.
- Elevated insulin and insulin-like growth factor have an effect in stimulating androgen production from the adipose tissue, ovaries and adrenals.
- Under chronic stress, excess cortisol is produced from the adrenal glands, triggering the release of elevated levels of prolactin and a sympathetic nervous system response.
- Prolactin has an inhibitory effect on the production of FSH and elevates the production of LH
- Glycyrrhiza glabra, Withania somnifera, Gymnema

# Elevated Androgens

- The ovarian and adrenal glands of women with PCOS are usually the sites of production of elevated androgens. It is postulated that these women have a hyperactive production of CYP17 enzyme, which is responsible for forming androgens in the ovaries and adrenals (from DHEA-S). (2) Elevated total and free testosterone correlate with the typically elevated LH levels. Serum total testosterone is usually up to twice the normal range (20 to 80 ng/dL). High androgen levels in the ovary inhibit FSH, thereby inhibiting development and maturation of the follicles. (1,2)
- DHEA is found to be elevated in 50% of women with PCOS. (2) The elevated DHEA is due to stimulation by ACTH, produced by the pituitary in response to stress. The excess DHEA then converts to androgens via adrenal metabolism, which in turn contributes to the typical elevated androgen levels in PCOS.
- The skin and adipose tissue add to the complex etiology of PCOS. Women who develop hirsutism have the presence and activity of androgens in the skin which stimulate abnormal patterns of hair growth. Aromatase and 17-beta-hydroxysteroid activities are increased in the fat cells and peripheral aromatization increases with body weight. The metabolism of estrogens by way of 2-hydroxylation and 17-alpha-oxidation is decreased. Estrogen levels increase as a result of peripheral aromatization of androstenedione. This cascade results in a chronic hyper-estrogen production (estrogen dominance). (2)
- Hirsutism occurs in 70% of women with PCOS in the US, as opposed to only 10 to 20% of Japanese women diagnosed with PCOS. (3) This may be explained by the genetically determined differences in 5-alpha-reductase activity between different cultures, or from a holistic standpoint, may reflect differences in endocrine behavior in accordance with local diet and levels of physical fitness.

# Estrogen Dominance

- The hypothalamic-pituitary axis imbalance can contribute significantly to the etiology of PCOS. The result of increased gonadotrophin releasing hormone (GnRH) output causes an elevation in the pulsatile output of LH and results in an elevated LH to FSH ratio (typically 2:1 respectively). (2,5) FSH is not increased as a result of elevated LH in this case, likely due to the hypothalamus responding via negative feedback to the already chronically elevated estrogen levels.
- About 25% of PCOS patients exhibit elevated prolactin, (1,2) known as hyperprolactinemia. Hyperprolactinemia results from abnormal estrogen negative feedback via the pituitary gland. Elevated prolactin can in turn contribute to elevated estrogen levels.

# 백작약(Paeonia lactiflora)

- Paeonia has been shown to positively influence low progesterone, reduce elevated androgens
  (testosterone) and acts to modulate estrogen and prolactin.
- active constituent paeoniflorin has been shown to affect the ovarian follicle by its action on the aromatase enzyme.
- Aromatase is important for follicle maturation, ovulation and corpus luteum function, steroid hormone synthesis and the regulation of the conversion of androgens to estrogens.
- The biofeedback in the pituitary and hypothalamus rely on aromatase to regulate prolactin and GnRH.
- The daily dose for Paeonia is 4.5 to 9 mL of a 1:2 dried plant extract.

# 작약과 감초

- 테스토스테론이 에스트로젠으로 가게 해주는 aromatase를 적절히 조절해서 에스트라디올을 형성하고 테스토스테론은 줄인다.-임신에 많은 도움
- LH를 줄이고 FSH는 증가시킨다

# Vitex agnus-castus (Chaste tree)

- Reduce prolactin from stress and hyperinsulin
- antiandrogenic properties.
- Vitex demonstrate a dopaminergic activity and dopamine inhibits the production of prolactin.
- Hyperprolactinemia causes for cyclical disorders, including corpus luteal insufficiency. This can lead to premenstrual syndrome (PMS) and progesterone deficiency, secondary amenorrhea and premenstrual mastalgia.
- Vitex reduced the thyroxin releasing hormone (TRH)-induced prolactin release (essentially a pituitary-thyroid axis problem), normalized shortened luteal phases, corrected luteal phase progesterone deficiencies and reduced PMS symptoms in women with luteal phase defects due to latent hyperprolactinemia.

# GlucoSupreme 인슐린조절

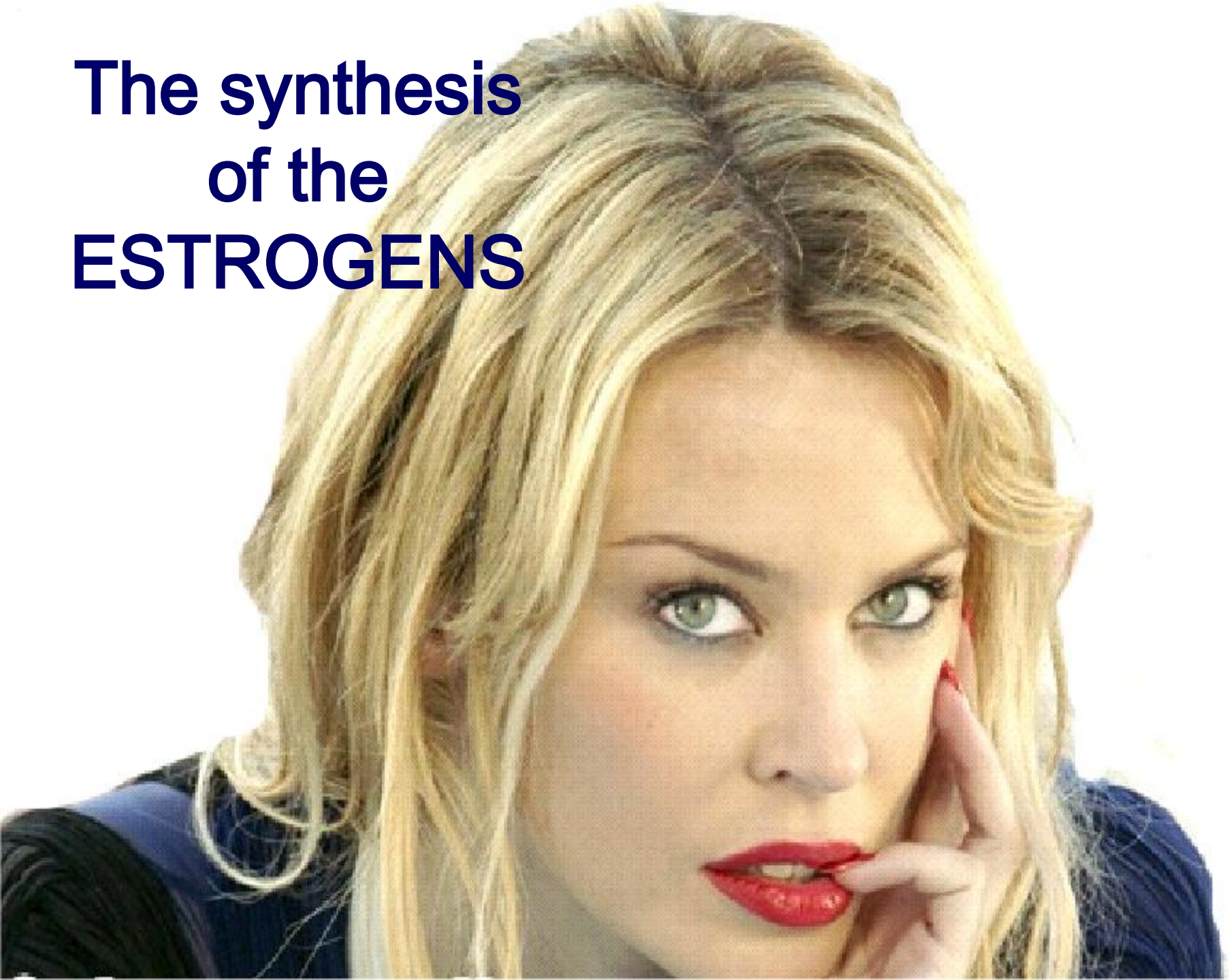
- Salacia 500 mg

  Fennugreek 500 mg
  American Ginseng 400 mg
  Gymnema 400 mg
  banaba 400 mg
  kudzu 400 mg
  Cinnamon 400 mg

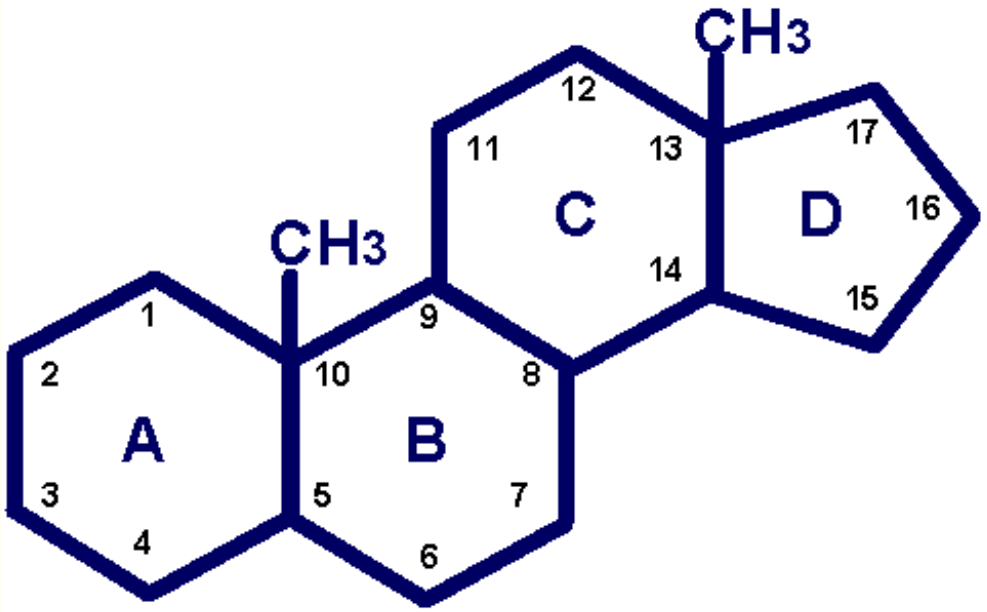
# Endotrim 인슐린조절

- Vitamin C 100 mg; Vitamin B6 5 mg; Pantothenic Acid 100 mg; Magnesium 10 mg; Zinc 5 mg; Chromium 200 mcg
- Green Tea 300 mg
- Forslean® 250mg
- Panax ginseng 200 mg
- Garcinia cambogia (200 mg
- Banaba Leaf 100 mg
- N-Acetyl L-Tyrosine 100 mg
- GABA 100 mg
- L-Carnitine100 mg
- Vanadium 100 mcg.

# The synthesis of the ESTROGENS

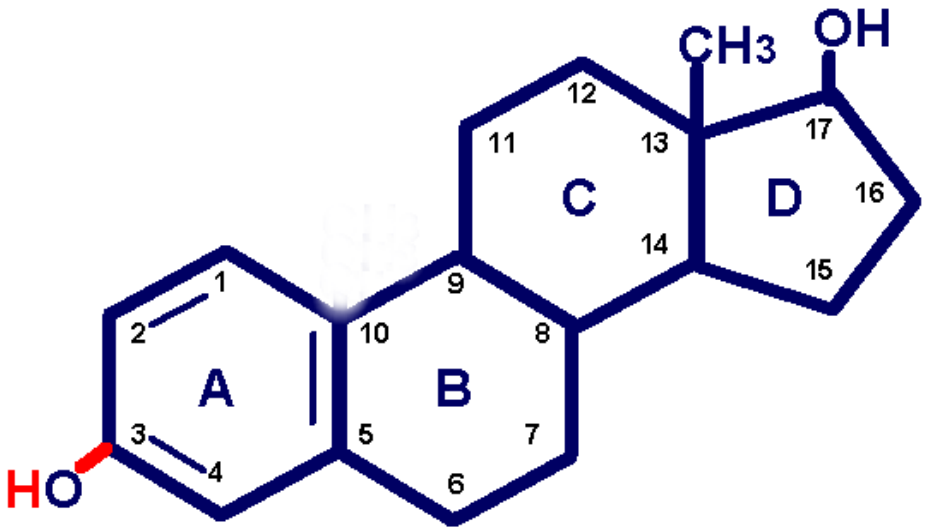


# Master Steroid Ring



# All naturally occurring estrogens contain

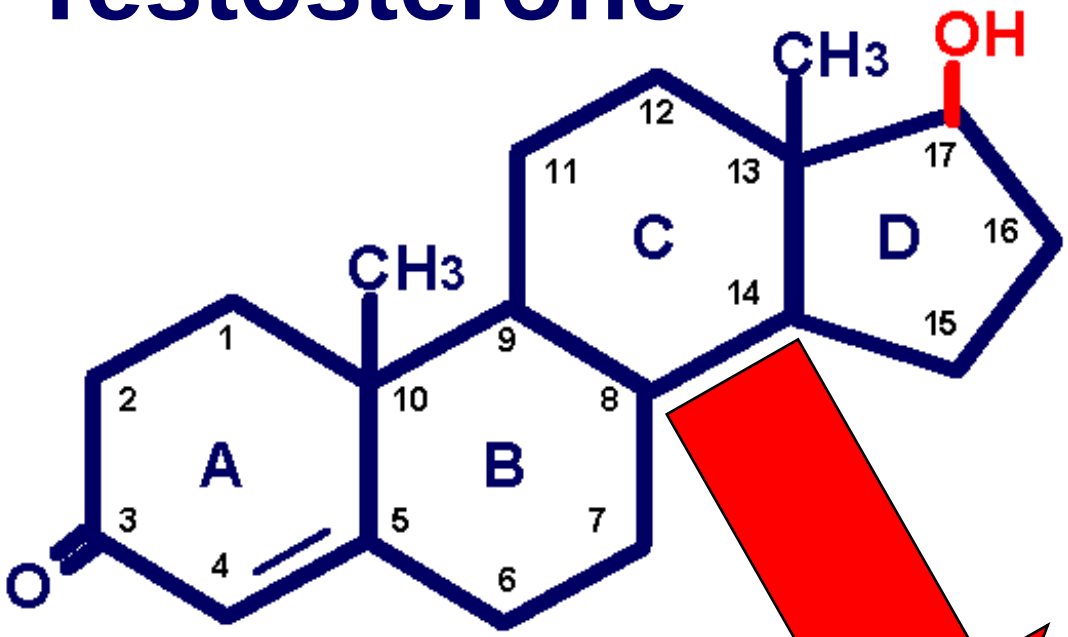
1.an unsaturated A ring




2.a phenolic hydroxyl group at C3

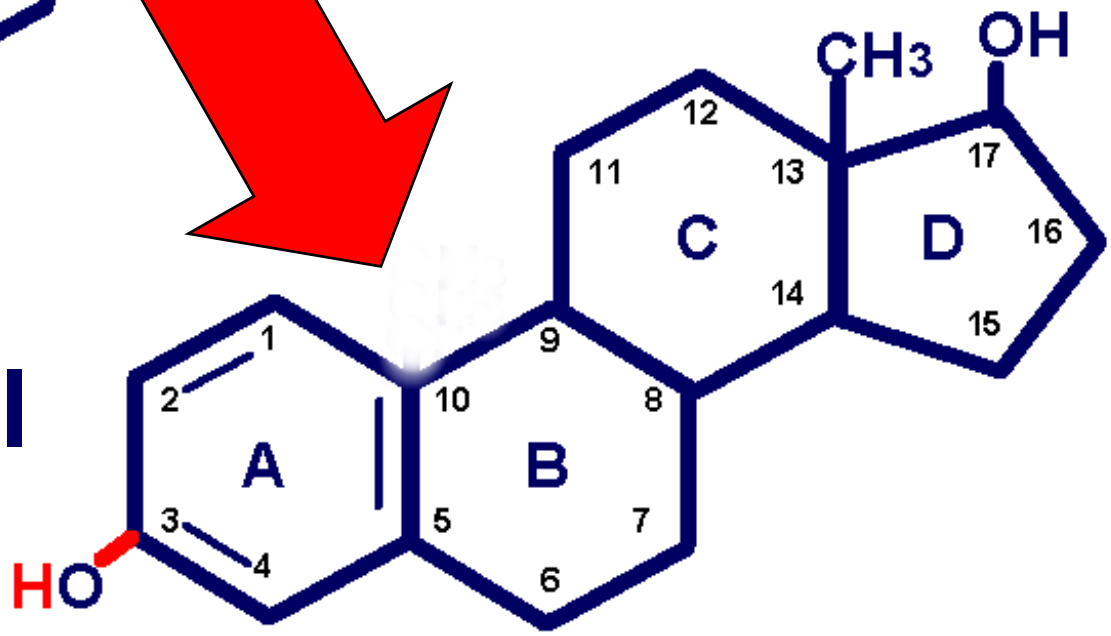
3.a methyl group at C13

# Testosterone

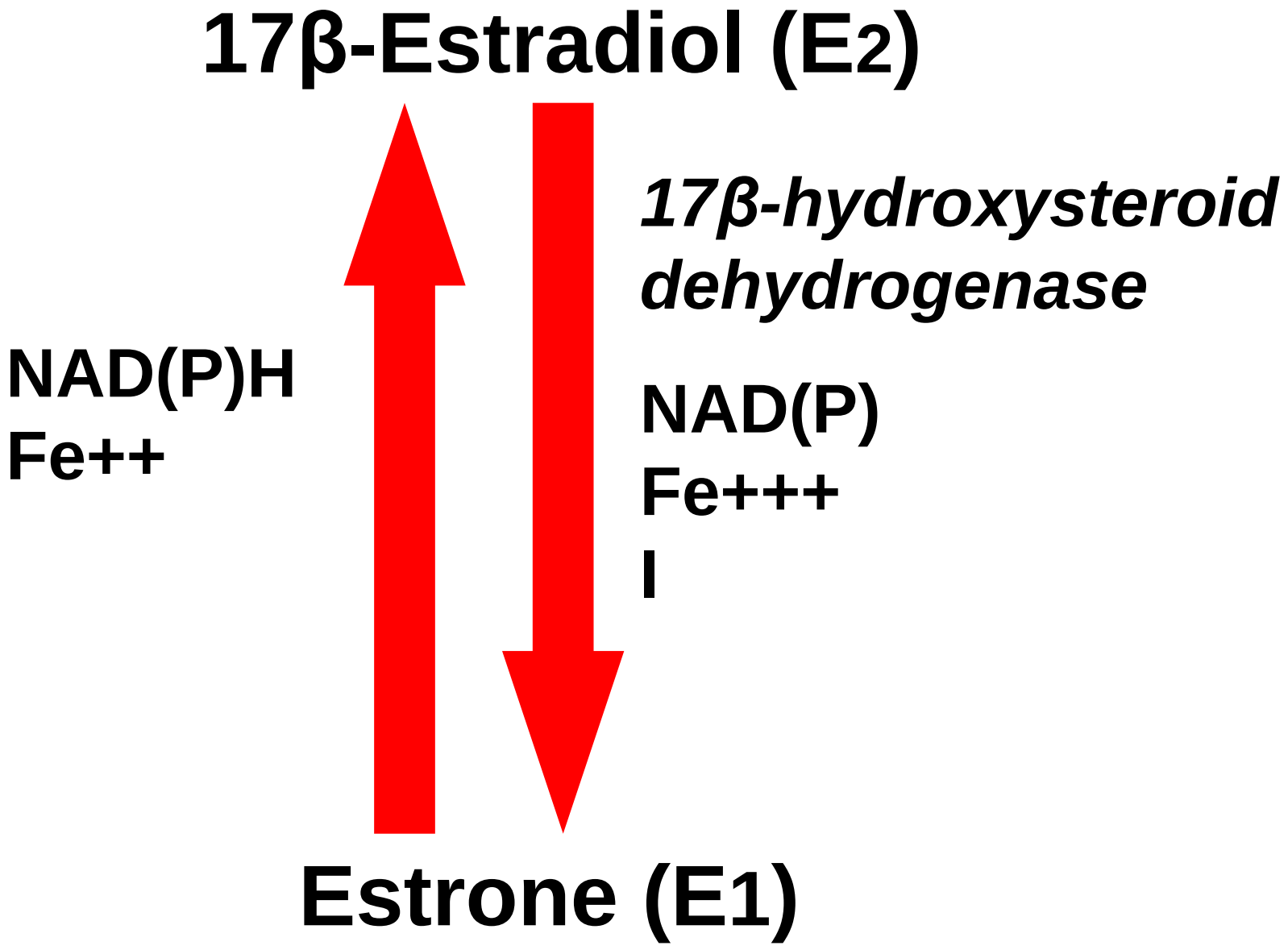



*cytochrome p450 (aromatase)*

**FADH2, NADPH, Fe++, O2, B, Vit E.**

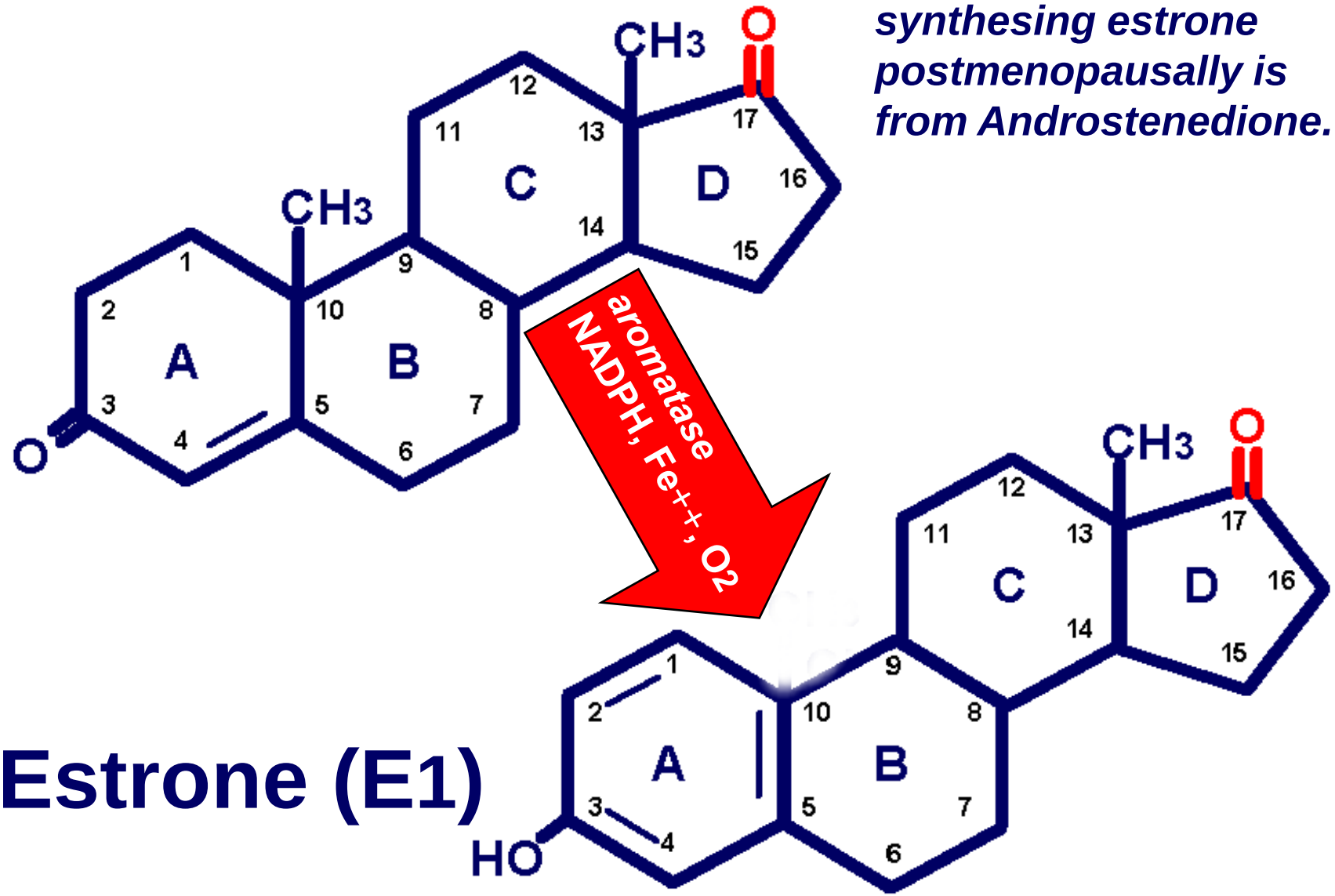



# 17β-Estradiol ($E_2$)


17β-Estradiol (E2)
17β-hydroxysteroid dehydrogenase
NAD(P)H
Fe++
NAD(P)
Fe+++
I
Estrone (E1)

# Androstenedione

*An alternative route to synthesing estrone postmenopausally is from Androstenedione.*

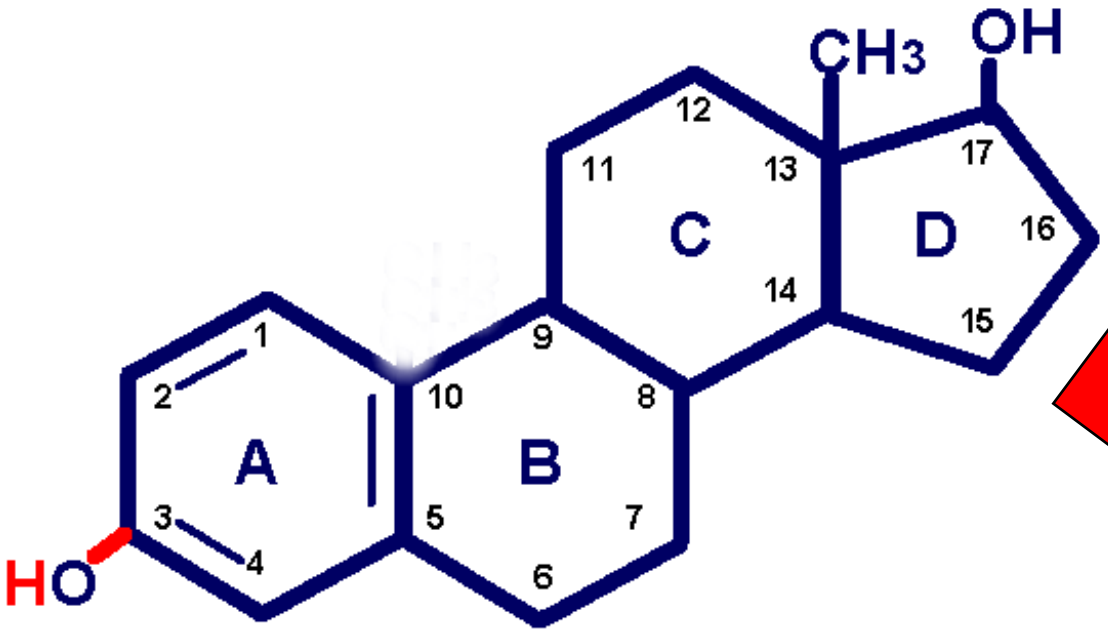



# Estrone (E1)

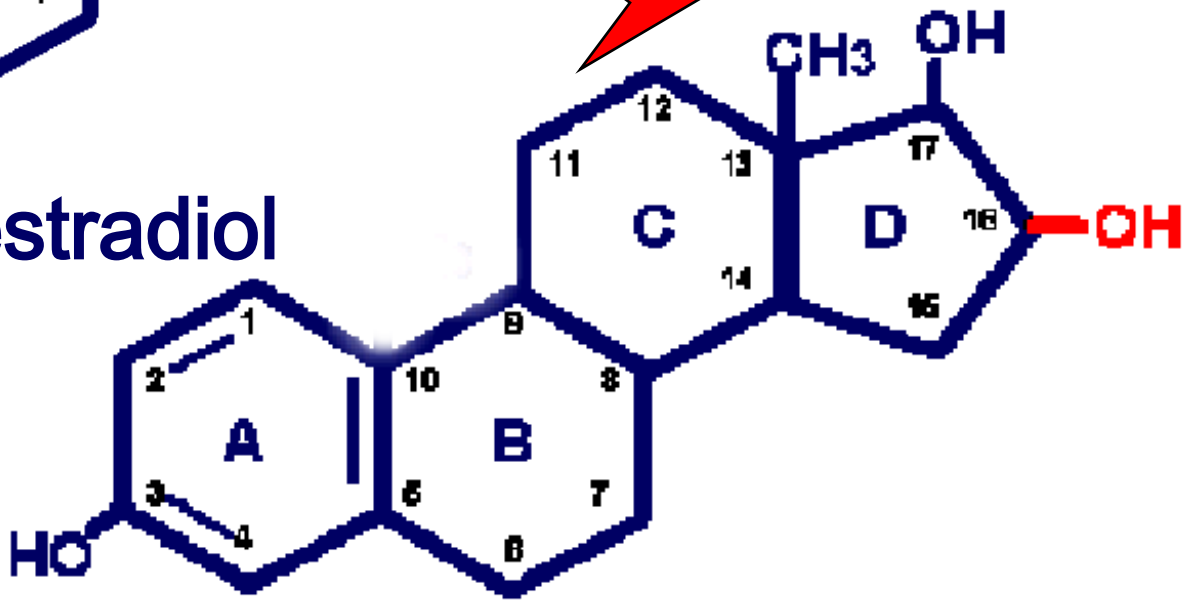
# 17β-Estradiol (E2)

*cytochrome p450*
*CYP 1A2*

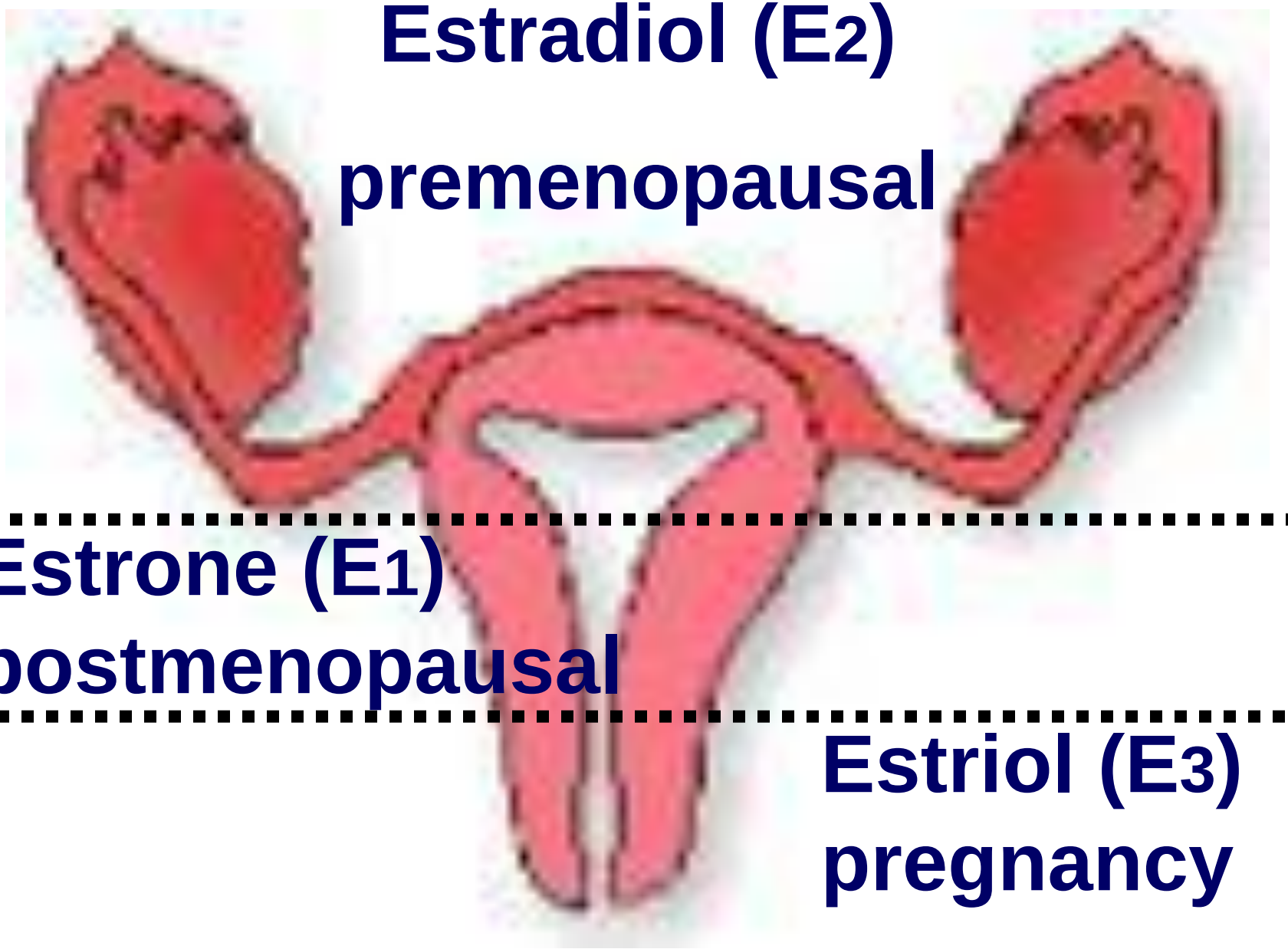
NADPH
Fe++
O2
I




16α- Hydroxyestradiol
(Estriol or E3)



**Estrogens influence the growth, differentiation and function of tissues of the female reproductive system i.e. uterus, ovaries and breast.**



**Estradiol ($E_2$)**

**premenopausal**

**Estrone ($E_1$)**

**postmenopausal**

**Estriol ($E_3$)**

**pregnancy**

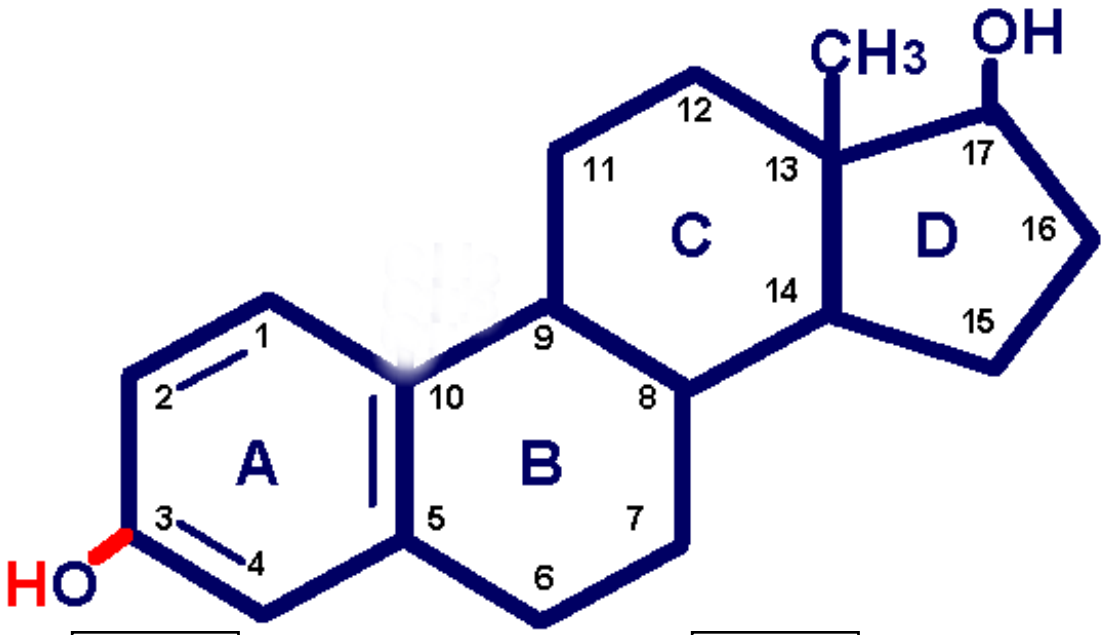
**Estradiol mainly targets the ovaries, fallopian tubes, the upper third of the uterus and the breast tissue.**

**Estrone mainly targets the mid portion of the uterus.**

**Estriol mainly targets the lower one third of the uterus and the vagina.**

# The metabolism of 17β-ESTRADIOL

# 17β-Estradiol (E2) hydroxylation




CYP 1A1

3A4

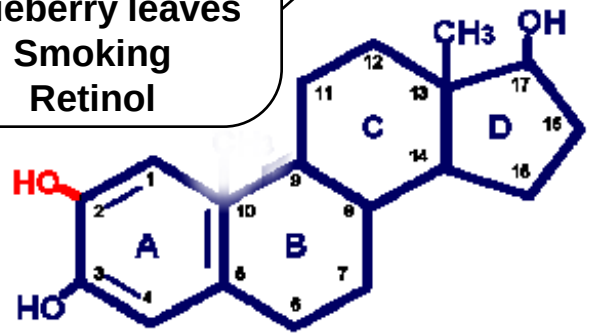
CYP 1B1

CYP 1A2

NADPH
Fe++
O2

Stimulated by
Indole-3-carbinols
Rosemary
Blueberry leaves
Smoking
Retinol

50%



2 Hydroxyestradiol

(2-OHE2)

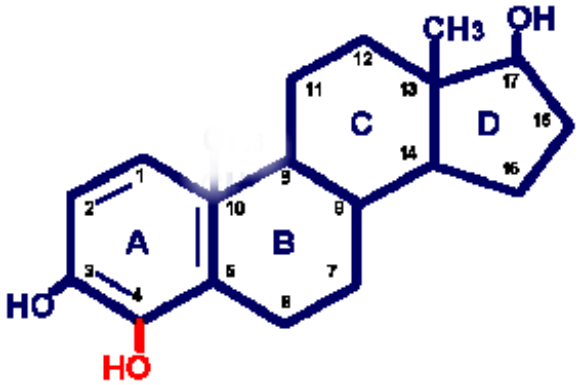
catechol – O-methyltransferase

Stimulated by
Char grilling
Tobacco

NADPH
Fe++
O2

Inhibited by
sulforaphanes

High in benign and malignant growths



4 Hydroxyestradiol

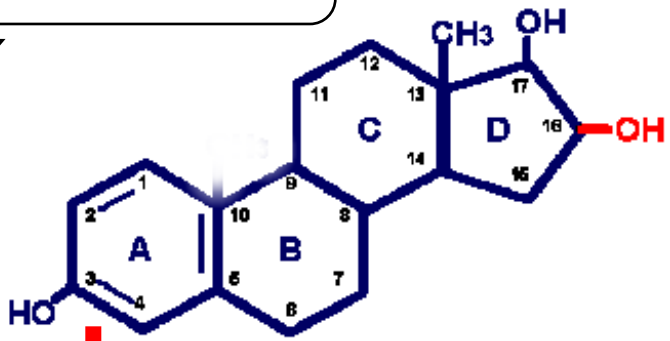
(4-OHE2)

COMT

Stimulated by
Omega 3 oils
Brassicas
Tobacco
Retinol
Iodine

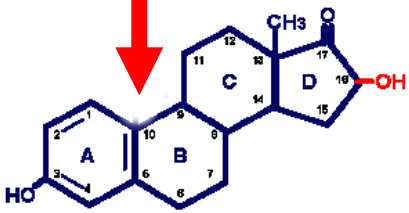
NADPH
Fe++
O2

Occurs mainly in the liver



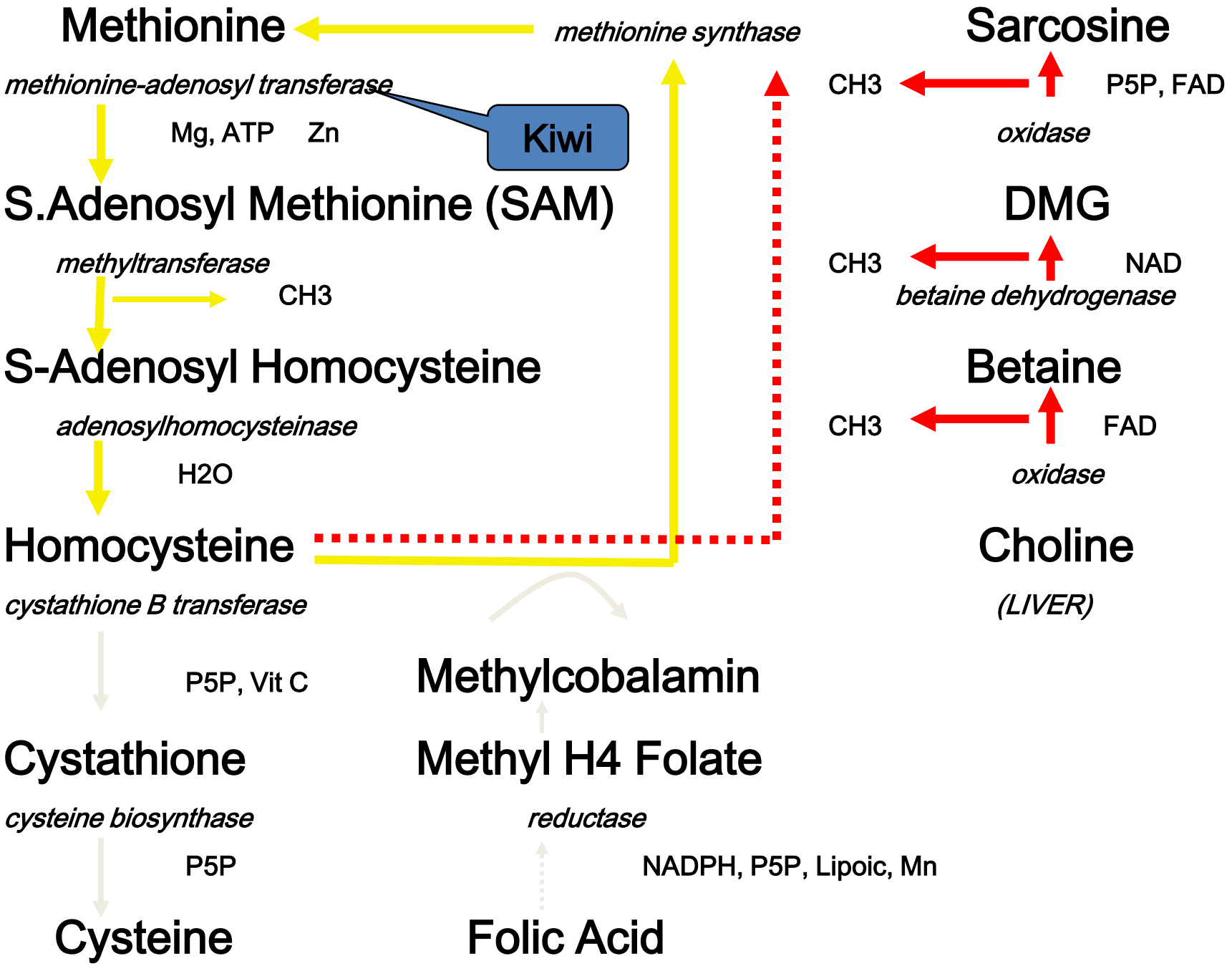
16α- Hydroxyestradiol

(16-OHE2) (Estriol or E3)



16α-Hydroxyestrone
(16-OHE1)

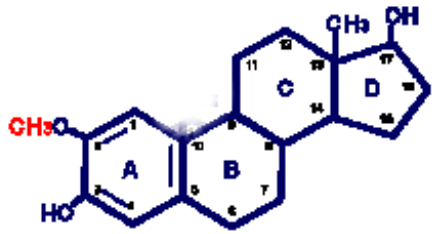
catechol – O-methyltransferase


Methionine
methionine synthase
Sarcosine
methionine-adenosyl transferase
CH3
P5P, FAD
Mg, ATP Zn
Kiwi
oxidase
S.Adenosyl Methionine (SAM)
DMG
methyltransferase
CH3
CH3
NAD
betaine dehydrogenase
S-Adenosyl Homocysteine
Betaine
adenosylhomocysteinase
CH3
FAD
H2O
oxidase
Homocysteine
Choline
cystathione B transferase
(LIVER)
P5P, Vit C
Methylcobalamin
Cystathione
Methyl H4 Folate
cysteine biosynthase
reductase
P5P
NADPH, P5P, Lipoic, Mn
Cysteine
Folic Acid

SAM

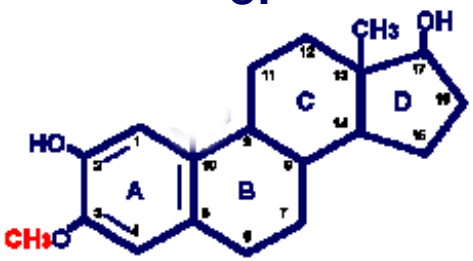
Mg++

Inhibited by
Catechins
Bioflavonoids
Catcholamines
Homocysteine
SAH



2-Methoxyestradiol (2-MeOE2)

or

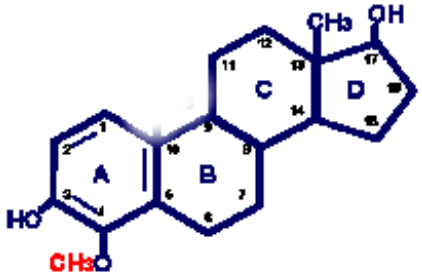


2-OH-3-Methoxyestradiol
(2-OH-3-MeOE2)

SAM

Mg++

Inhibited by
Catechins
Bioflavonoids
Catcholamines
Homocysteine
SAH

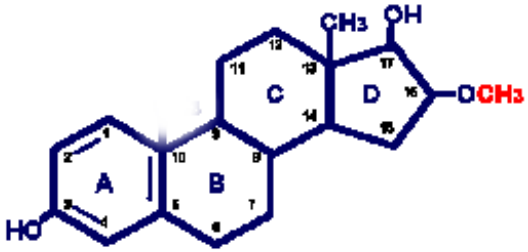


4-Methoxyestradiol (4-MeOE2)

conjugation

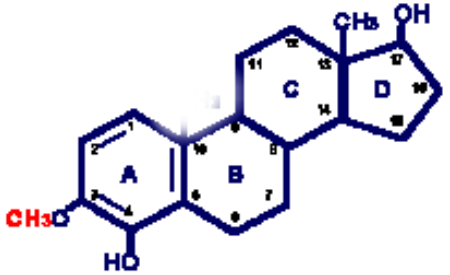
SAM

Mg++



16α-Methoxyestradiol
(16-MeOE2)

or



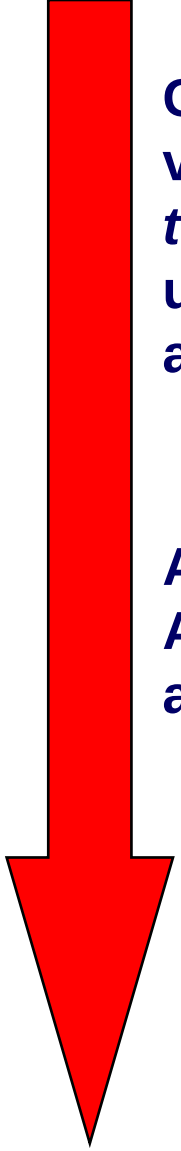
3-Methoxy- 4-OH-Estradiol
(3-MeO-4-OH-E2)

**Sulfation from various *sulfotransferase* enzymes using PAPs or Sulfur as the cofactor**

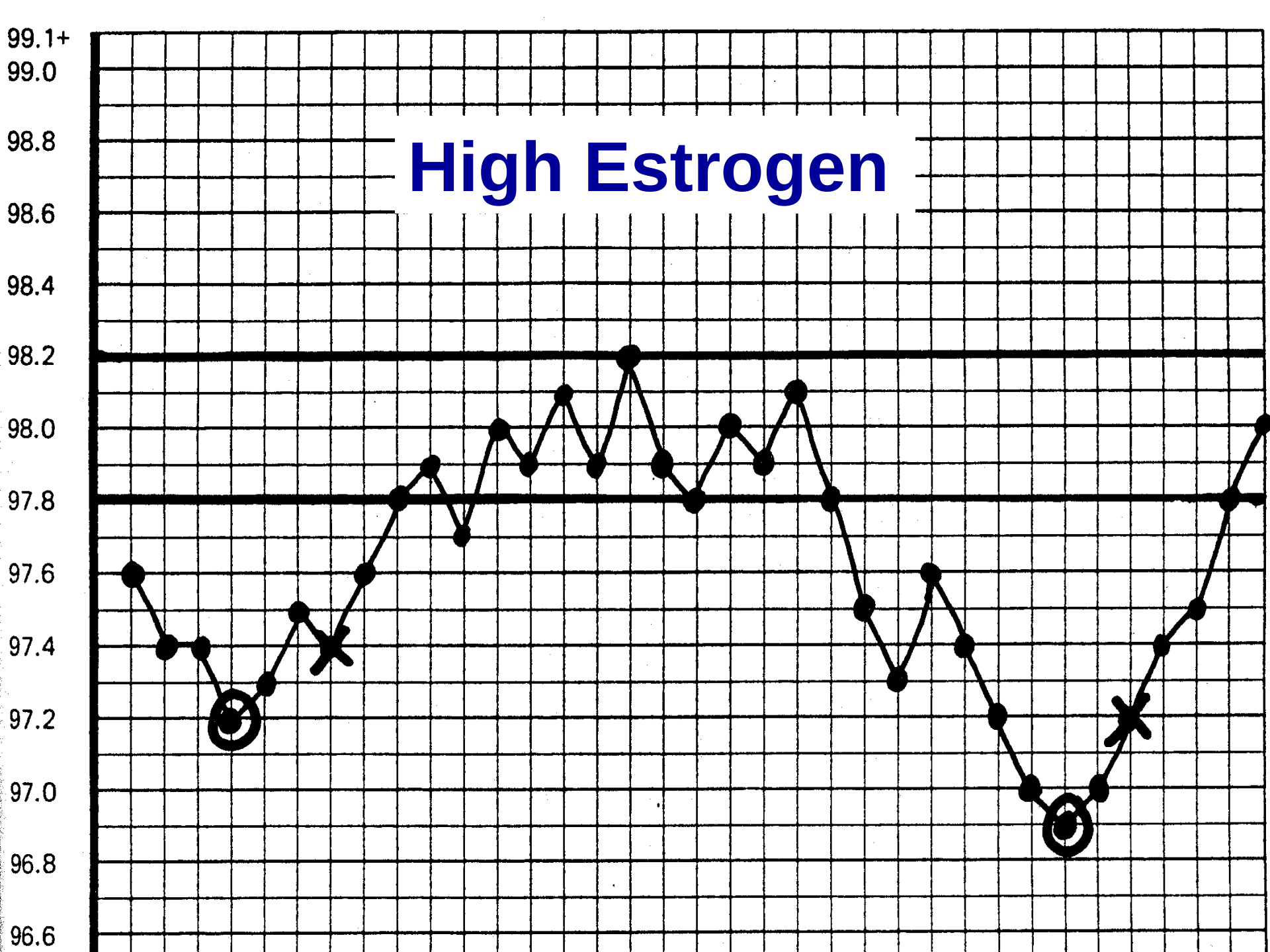
**Glucuronidation from various *glucuronosyl transferse* enzymes using UDP-glucuronic acid as the cofactor**

**Glutathione conjugation from various *glutathione-s-transferase enzymes* using glutathione as the cofactor**

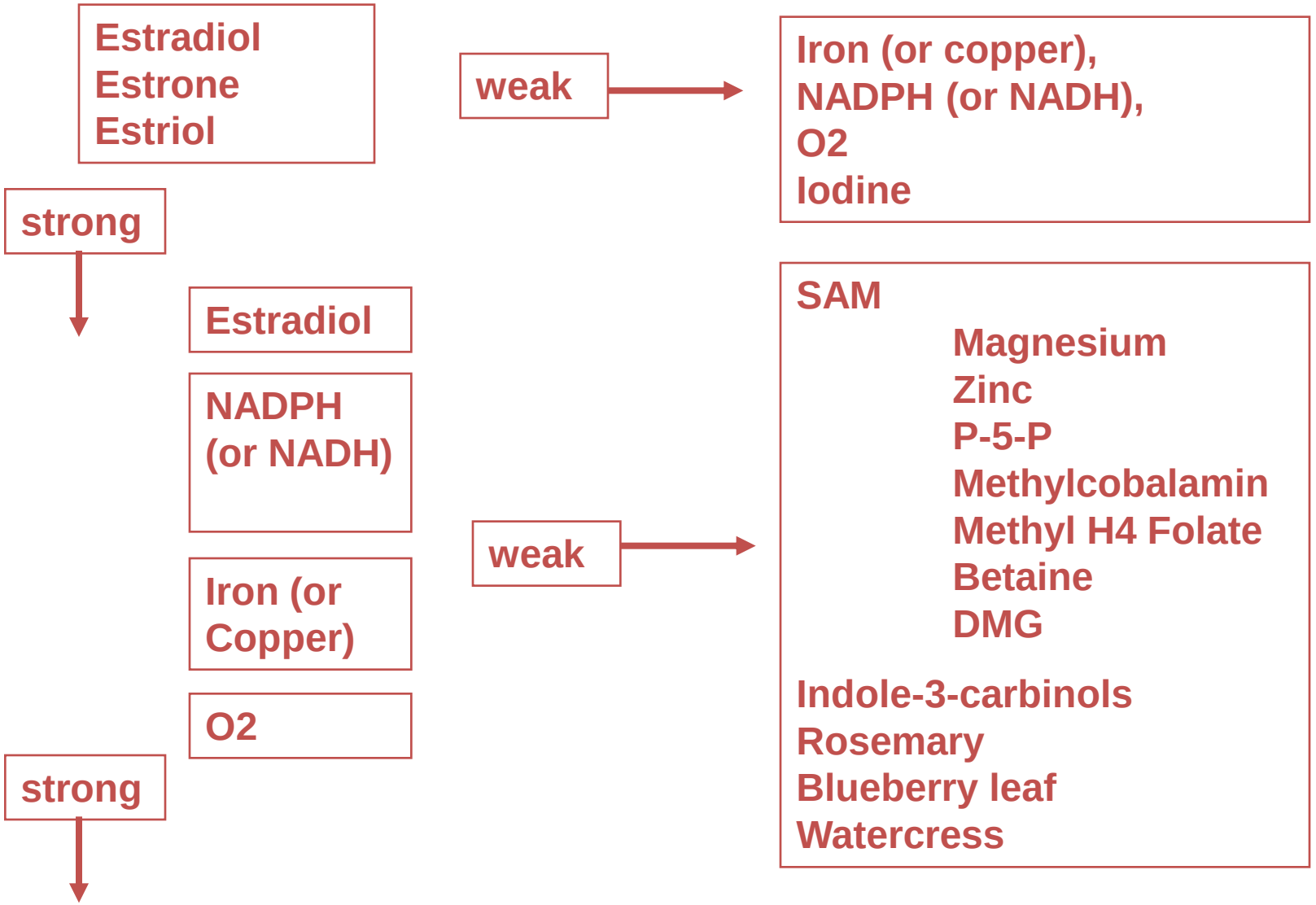
**Acetylation using AcetylCoA as the acetyl donor**

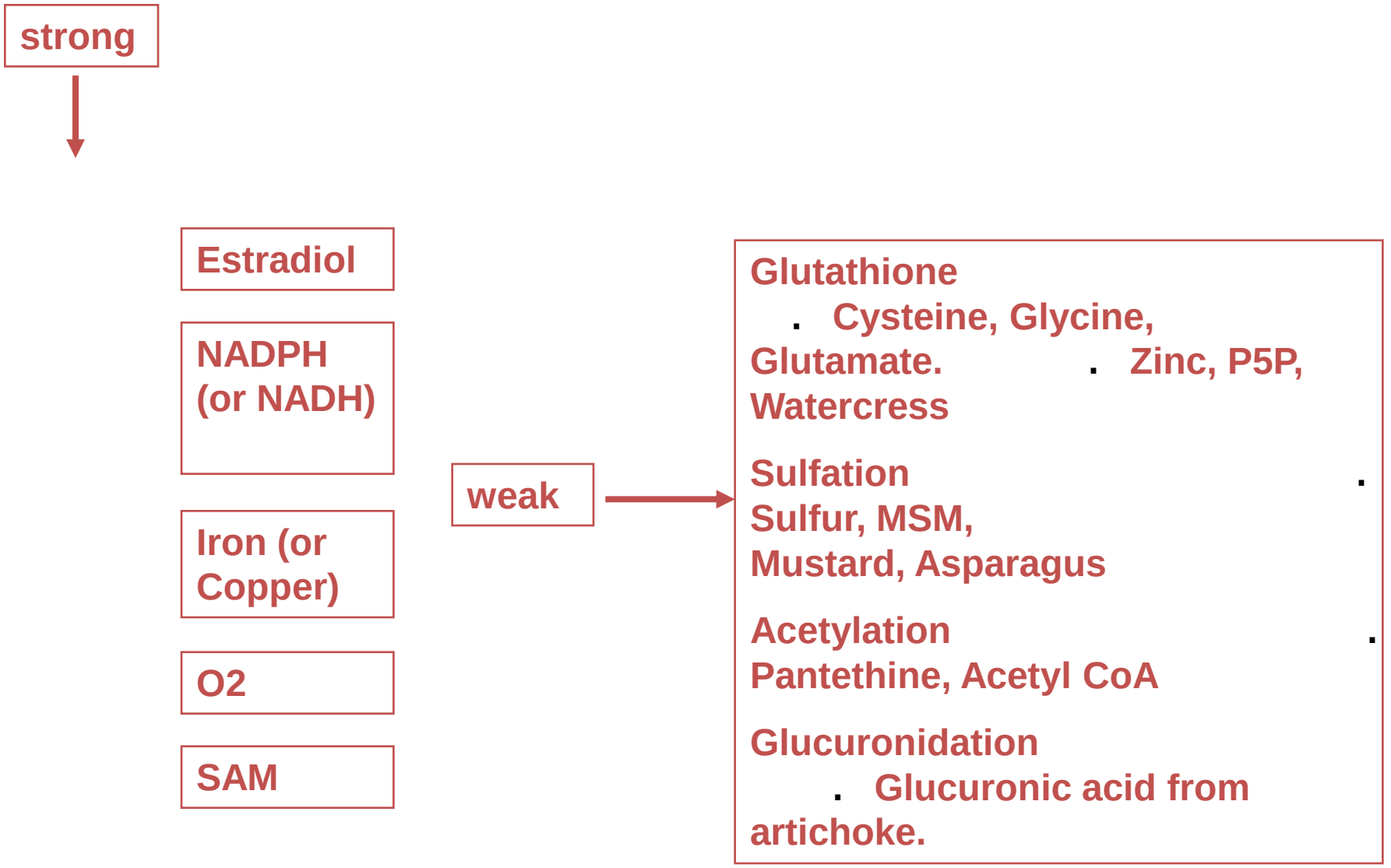


**Methoxyestradiol conjugates excreted in the urine and bile**


High Estrogen
99.1+
99.0
98.8
98.6
98.4
98.2
98.0
97.8
97.6
97.4
97.2
97.0
96.8
96.6

# Metabolics Testways

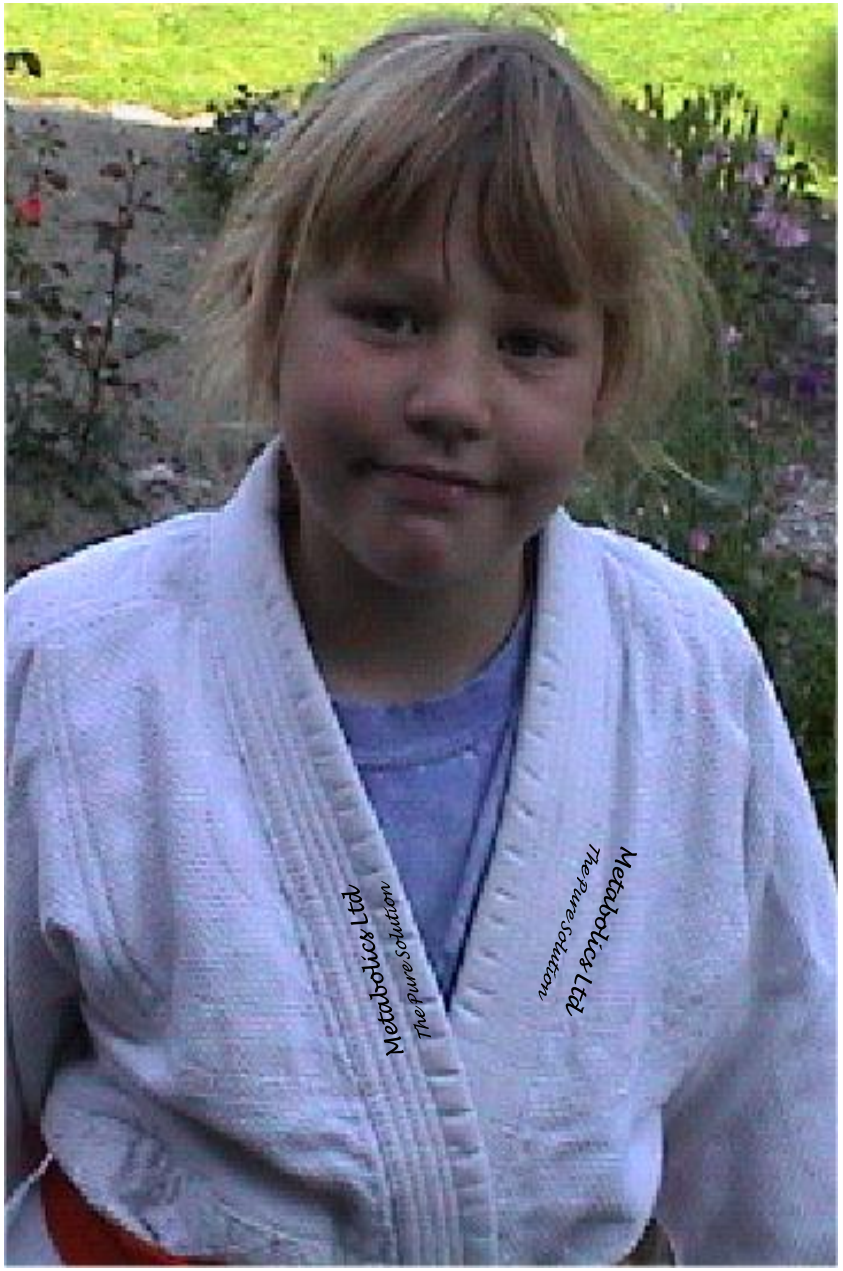



strong
Estradiol
NADPH
(or NADH)
Iron (or
Copper)
O2
SAM
weak
Glutathione
. Cysteine, Glycine,
Glutamate. . Zinc, P5P,
Watercress
Sulfation .
Sulfur, MSM,
Mustard, Asparagus
Acetylation .
Pantethine, Acetyl CoA
Glucuronidation
. Glucuronic acid from
artichoke.

**Extragonadal conversion of Androstenedione to Estrone pre and post menopausally occurs mainly in fibroblasts surrounding adipose tissue. Adipose tissue expression of *aromatase* is highest in the Buttocks, followed by the Thighs and lowest in the Abdomen.**

# Estrogen risk factors

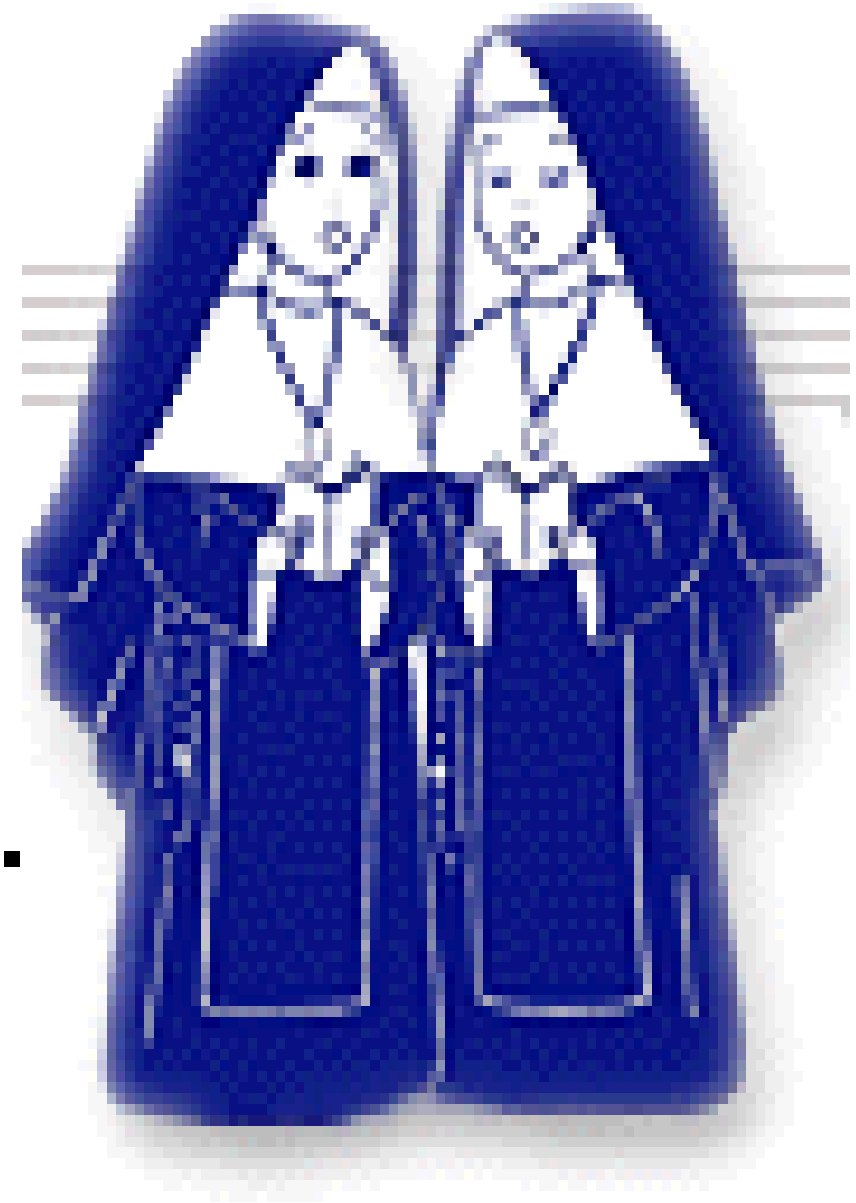
1. **Age of menache.**
   **Higher risk**
   **the earlier**
   **the menarche,**
   **thus longer**
   **overall**
   **estrogen**
   **exposure.**



**2.Parity.**

**Higher risk in nulliparity.**

**Nuns have 20% higher estrogen levels.**



**3. Age of first birth.**

**Higher risk with first birth after 30 years.**

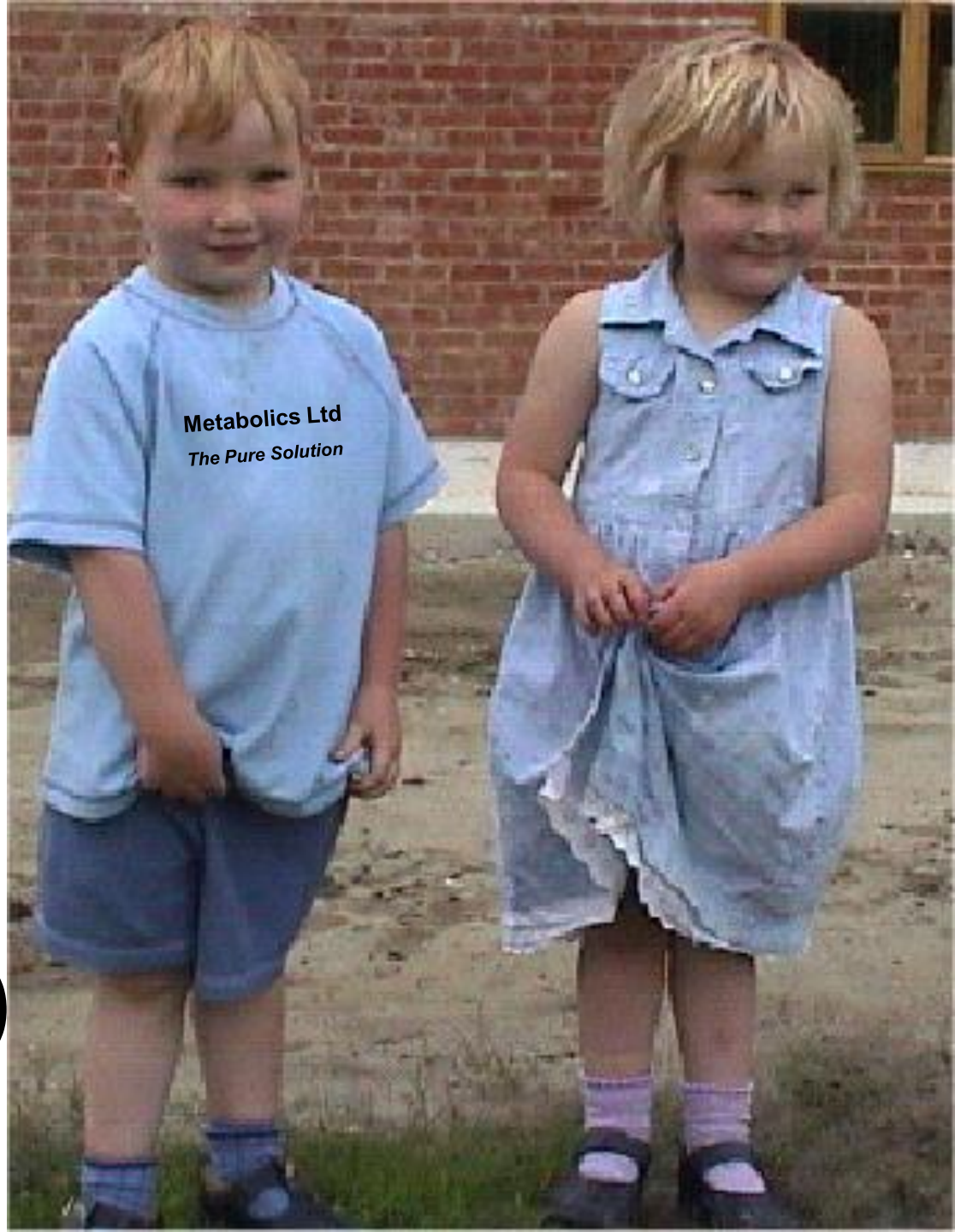
**Lowest risk with first birth before 20 years (higher prolactin levels).**

**4. Lactation reduces total estrogen exposure time due to**

**a) the delay of the ovulatory cycle.**
**b) increased prolactin**
**c) decreased estrogen production**
**d) terminal differentiation of mammary epithelium**
**e) elimination of carcinogens.**

**5. Women born prematurely before 33 weeks of gestation have increased risk.**

# 6. Women with a twin brother have higher estrogens. (Greater exposure to estrogens in the placenta)



**7. Later the menopause the longer the overall estrogen exposure.**

# 8. Width and Height.

**Increased risk postmenopausally.**
**Increased protection premenopausally due to lower ovulations and increase sequestration of $E_2$ in adipose tissue.**

**9. Diet. Higher risk with high saturated fat intake.**

**Lowest risk with high oleic fatty acid and Omega 3 oil intake.**

**High alcohol intake induces liver aromatase.**

**Postmenopausal women receiving estrogen replacement therapy experienced a significant and sustained increase in circulating E2 following ingestion of alcohol**

**10. Bone density depends in part on estrogen levels.**

**E2 affects bone mass most likely via the ER in osteoblasts.**

**Women with hip fractures have a 16% lower risk of breast cancer and women with forearm fractures an even greater reduction of 58% compared to women without fractures.**

**11. Family history. Increased likelihood of inheriting various polymorphisms. No evidence of CYP polymorphisms having any influence. Some evidence with COMT polymorphisms.**

**Women whose mother and sister both have a history of breast cancer have a relative risk of 2.5 compared with those without a family history**

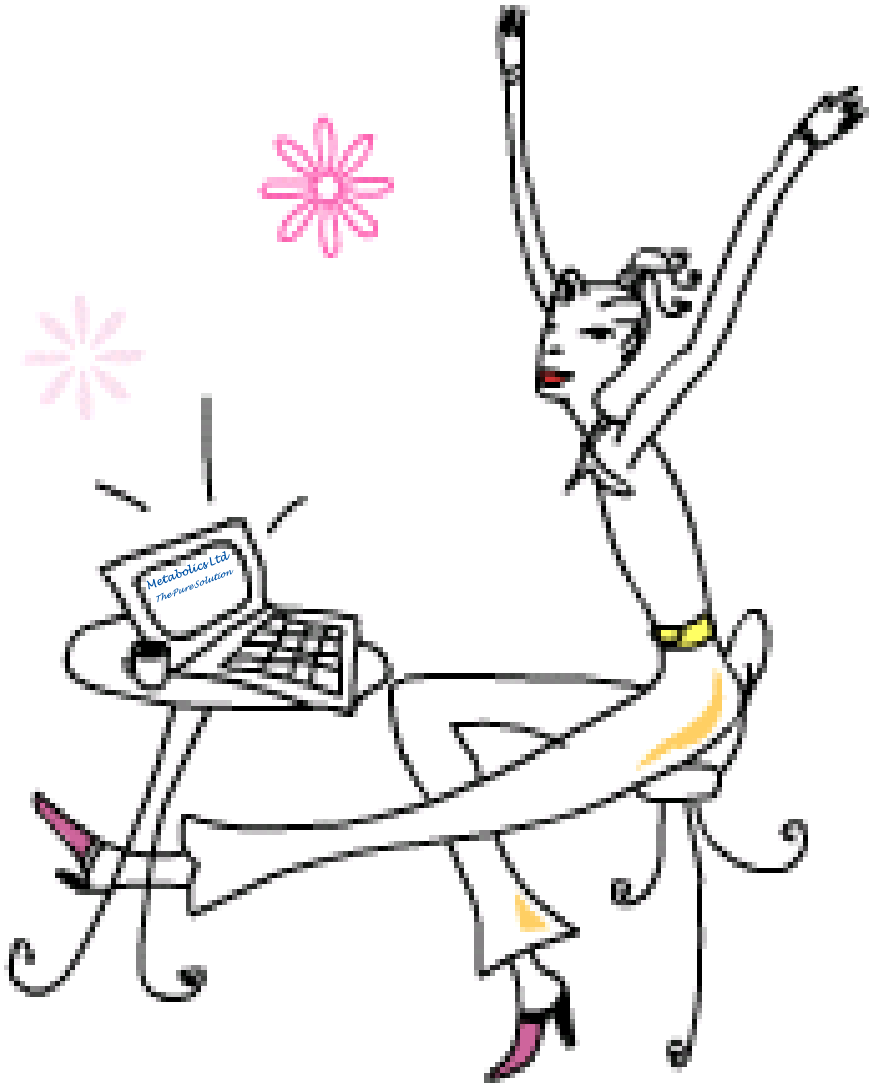
# 12. Enzyme polymorphisms

**Evidence that polymorphisms in CYP 1A1 or CYP 1B1 are of significance. However studies of COMT gene polymorphisms G>A increased the risk by 2 fold due to significantly decreased enzyme activity.**

# 13. Endogenous estrogen concentration.

**It appears that differences in serum $E_2$ concentration could be etiologically important especially in post-menopausal women.**

**14. Exogenous estrogen concentration from oral contraceptives and hormone replacement therapy increase risk.**




"I have a 3-month supply.
I have it delivered to my home."

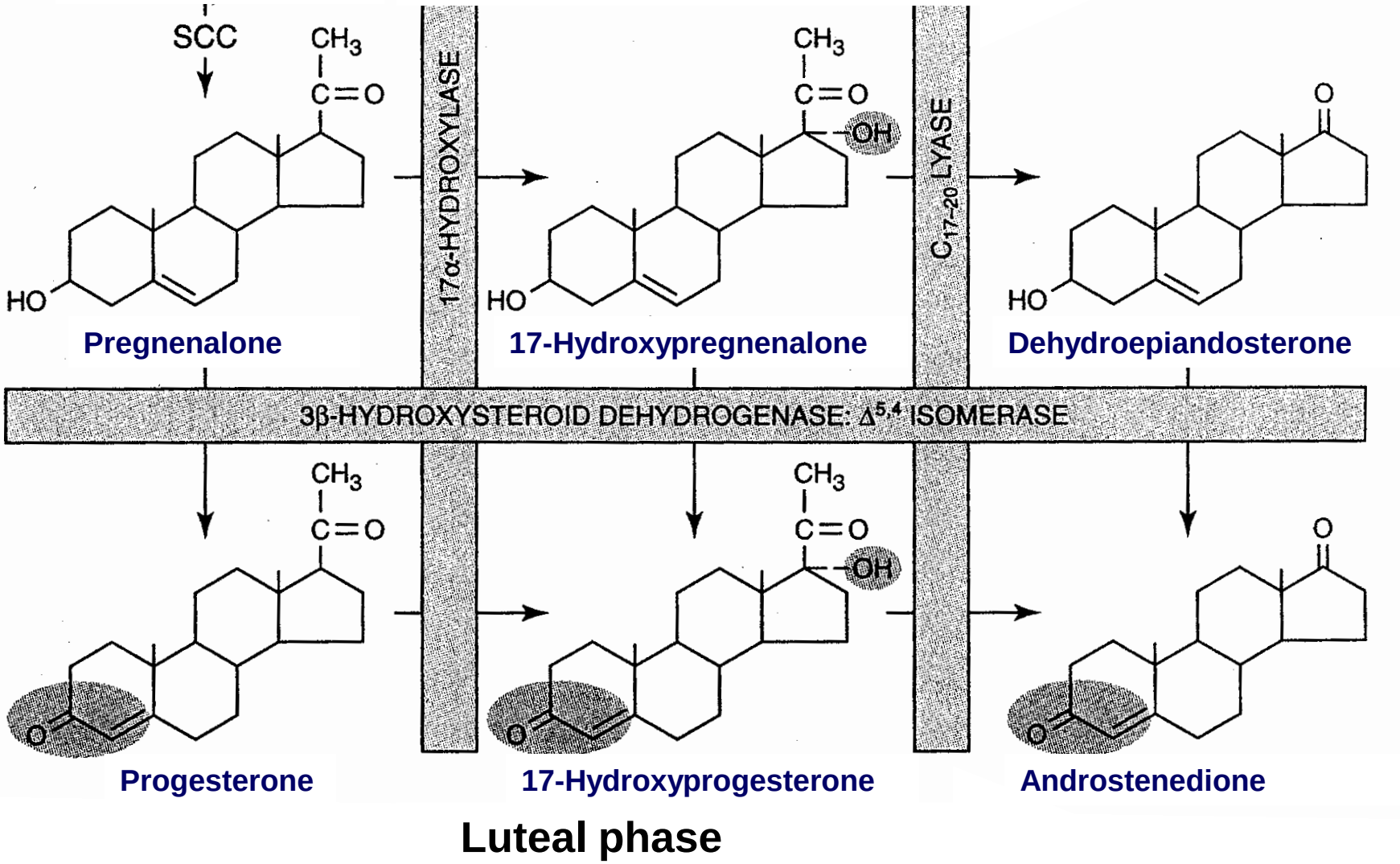
**15. Phytoestrogens.** Formed from lignans (enterolactone) and from isoflavones (equols) by colonic bacterial fermentation.

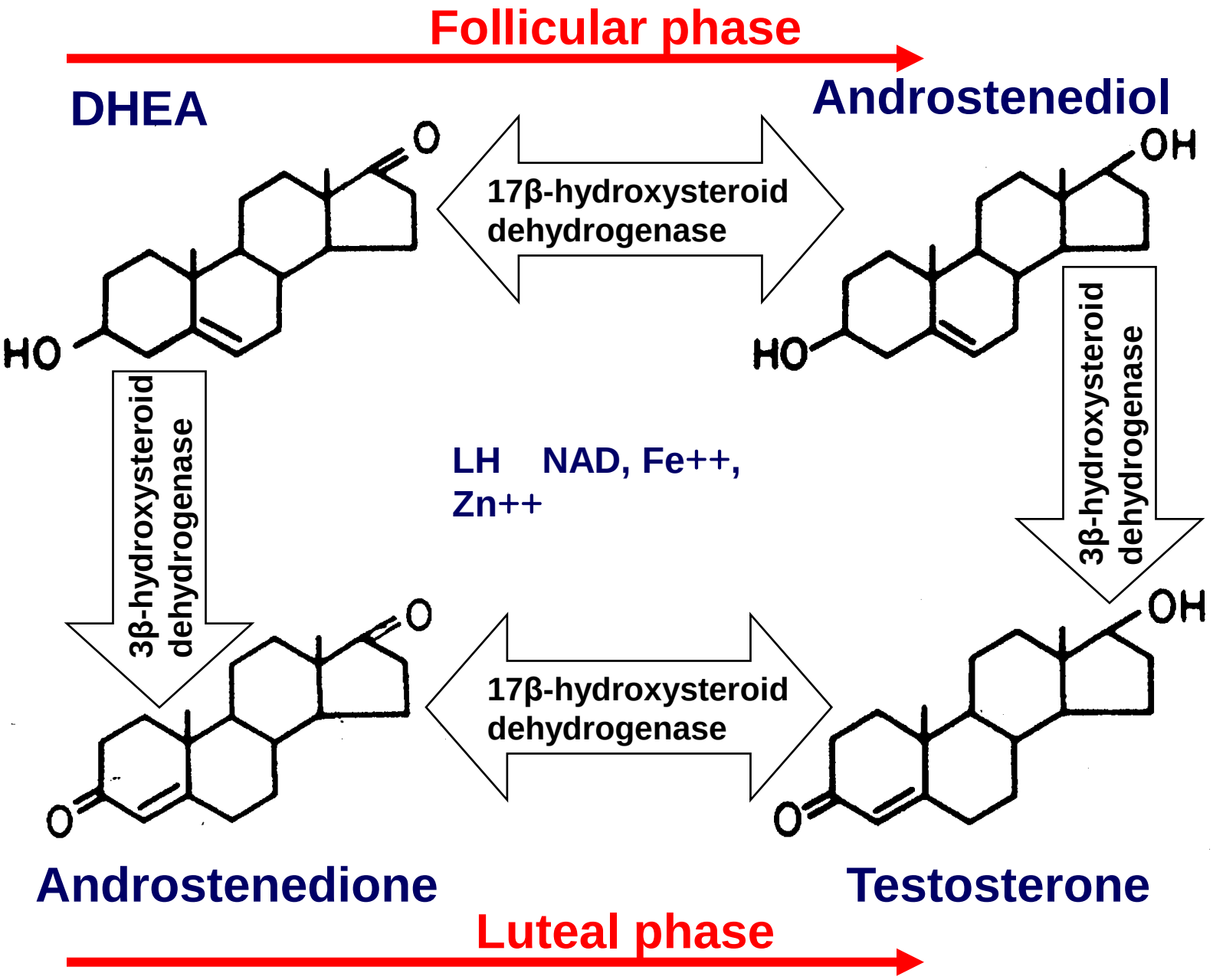
Work by **inhibiting aromatase and 17β-hydroxysteroid dehydrogenase enzymes** and by increasing serum binding globulin thus lowering free estrogens.

# 16. Xenoestrogens.

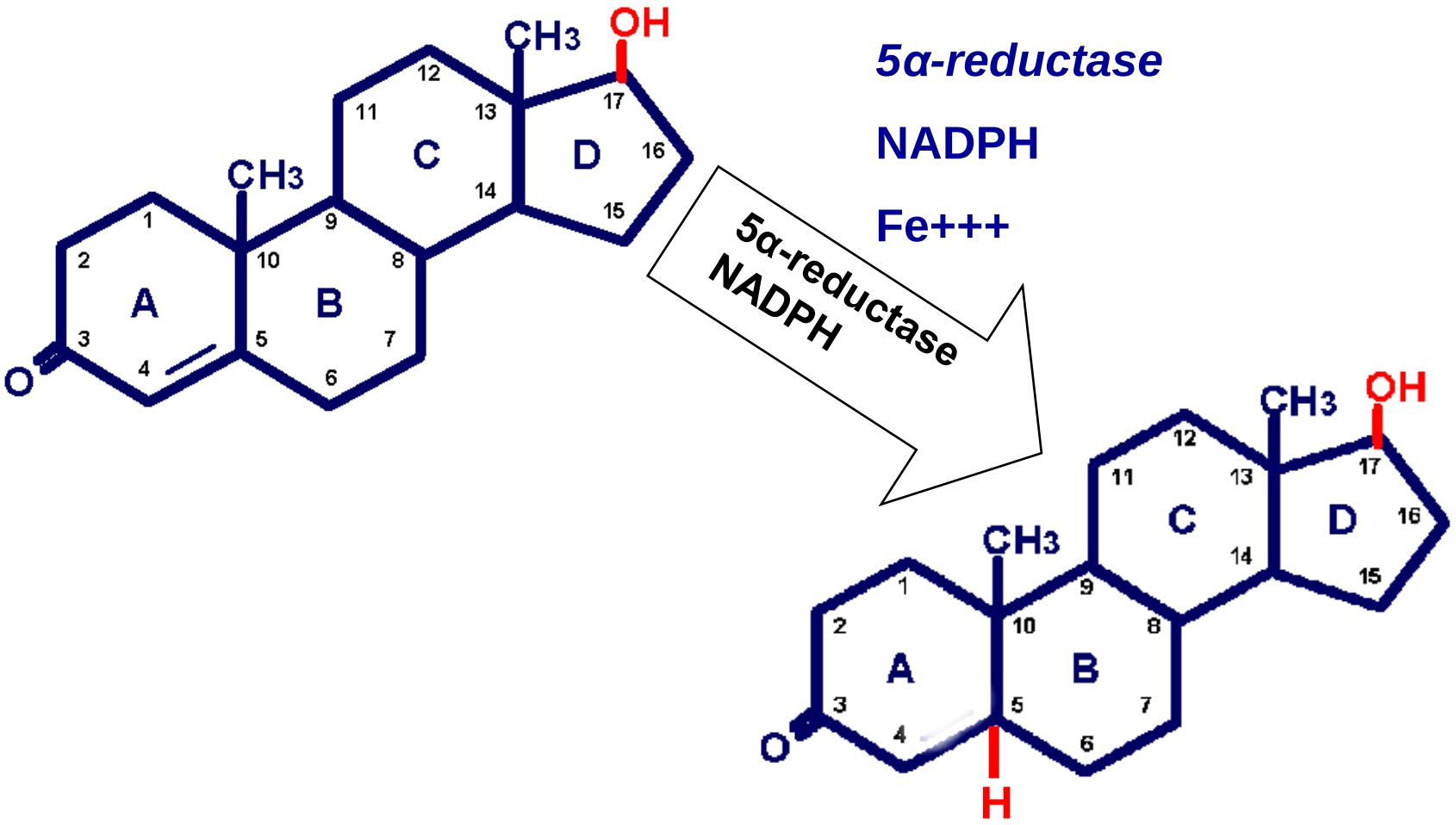
**Organochlorides (DDT, DDE), carbamates, PCB's, plasticizers, styrenes, nonylphenols all can have weak estrogen like effects.**

# The synthesis of the ANDROGENS (testosterone)


Cholesterol
Follicular phase
SCC
CH3
C=O
HO
17α-HYDROXYLASE
OH
C17-20 LYASE
O
Pregnenalone
17-Hydroxypregnenalone
Dehydroepiandosterone
3β-HYDROXYSTEROID DEHYDROGENASE: Δ5,4 ISOMERASE
Progesterone
17-Hydroxyprogesterone
Androstenedione
Luteal phase


Follicular phase
DHEA
Androstenediol
17β-hydroxysteroid dehydrogenase
HO
O
OH
3β-hydroxysteroid dehydrogenase
LH NAD, Fe++, Zn++
17β-hydroxysteroid dehydrogenase
Androstenedione
Testosterone
Luteal phase

# Testosterone




# Dihydrotestosterone

**Testosterone**

**Inhibited by**
**saw palmetto**
**stinging nettle root**
**Pygeum africanum**

***5α-reductase***

**NADPH**

**Fe+++**

**Dihydrotestosterone**

# DHEA

**Dehydroepiandosterone is the most abundant androgen in the body. Females have 90% of the levels of males.**
**It peaks by age 20 years and declines with age and chronic stress.**

**DHEA**
**Stimulates sexual function.**
**Increases gonadal growth.**
**Maintains wakefulness.**
**Lifts depression.**
**Stimulates the thymus to mature and differentiate T, B and NK cells.**
**It is a powerful antioxidant.**
**Lowers cholesterol.**

**TESTOSTERONE**

**Is produced in response to LH in the Leydig cells.**

**(Both LH and FSH are necessary for spermatogenesis which occurs first in the seminiferous tubules and later in the Sertoli cells.)**

**TESTOSTERONE targets the Wolffian structures, spematogonia,muscles, bones, kidney and brain.**

**DIHYDROTESTOSTERONE (DHT) is the active form that targets the seminal vesicles, prostate, external genitalia, skin and hair.**

**Testosterone and DHT function to**

1. **Sexual differentiation.**
2. **Spermatogenesis.**
3. **Secondary sexual characteristics.**
4. **Anabolic metabolism.**
5. **Gene regulation.**
6. **Male pattern behaviour.**

## The Dr. Sears Testosterone Self-Assessment Test

1. frequently 2.Occasionally 3. Never

1. Do you have trouble obtaining an erection? 1 ○ 2 ○ 3 ○

2. Do you lose your erection before orgasm? 1 ○ 2 ○ 3 ○

3. When attempting sexual intercourse, how often is it unsatisfactory for you? 1 ○ 2 ○ 3 ○

4. How often do you lack interest in sex? 1 ○ 2 ○ 3 ○

5. Do you drink alcohol? 1 ○ 2 ○ 3 ○

6. Do you smoke tobacco? 1 ○ 2 ○ 3 ○

7. Do you find yourself with a lack of ambition or motivation? 1 ○ 2 ○ 3 ○

8. Do you ever lack the energy to climb a short flight of stairs? 1 ○ 2 ○ 3 ○

8. Do you ever lack the energy to climb a short flight of stairs? 1 ○ 2 ○ 3 ○

9. Do you ever find yourself becoming moody, depressed or irritable without good reason? 1 ○ 2 ○ 3 ○

10. How often do you find yourself lacking the strength to lift heavy household objects, like a full garbage can? 1 ○ 2 ○ 3 ○

11. How often do you lack the desire to get up in the morning? 1 ○ 2 ○ 3 ○

12. How often are you disinterested in exercising? 1 ○ 2 ○ 3 ○

13. How many prescription drugs do you take? 3 + ○ 1-2 ○ n/a ○

14. Pinch your fat just to the side of your belly button; how much can you pinch >1" ○ 1" ○ <1" ○

15. What is your age? >50 ○ 35-50 ○ <35 ○

**Scoring:**

**Score 10pts for each 3**
**Score 5pts for each 2**
**Score 1pts for each 1**

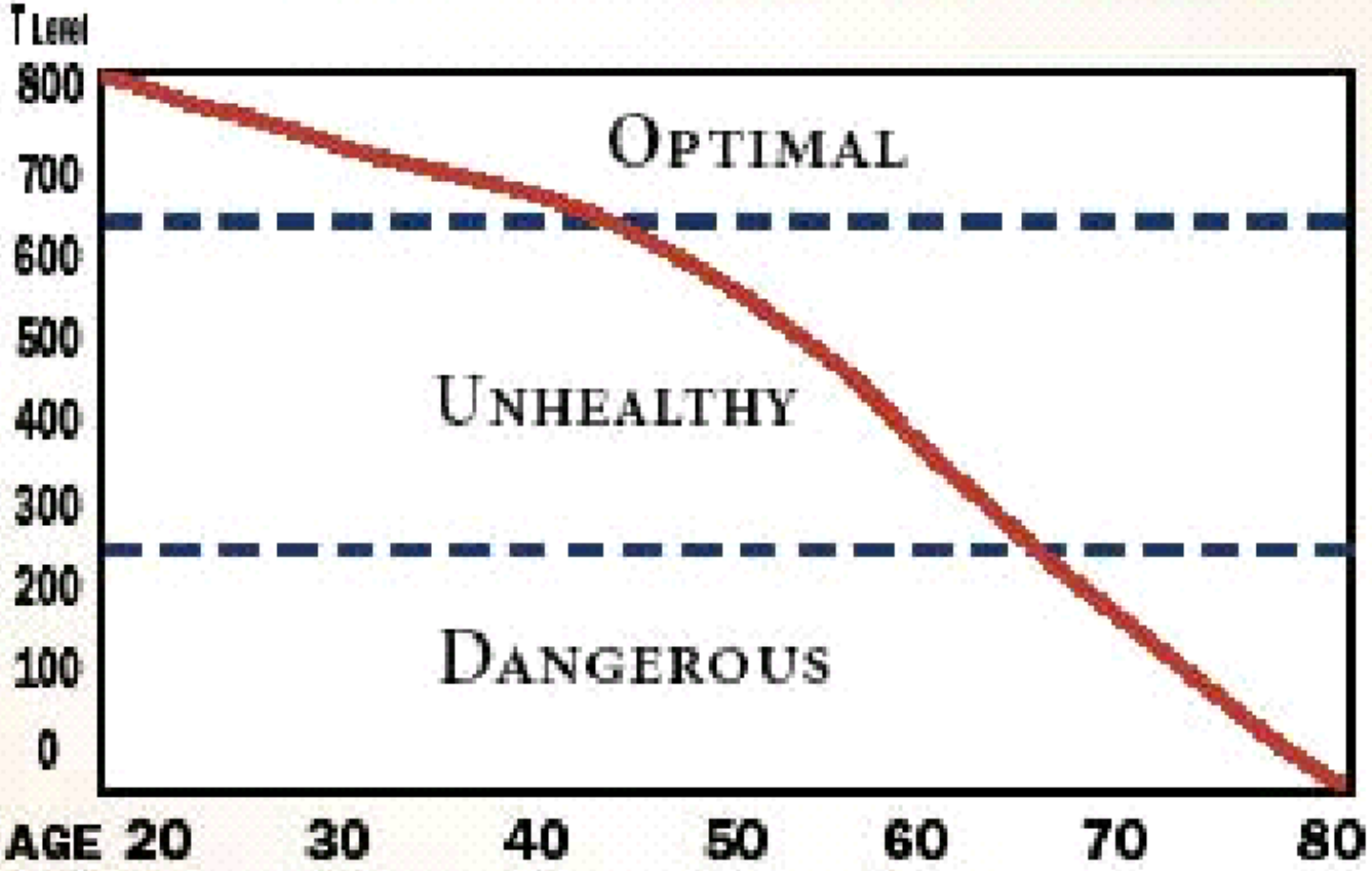
**Interpretation:**

**Above 125: You stud! Keep up the good work!**

**100-125: Average. You might benefit from higher testosterone levels, but its not urgent.**

**Below 100: You are probably suffering from falling testosterone levels. Seek a solution.**

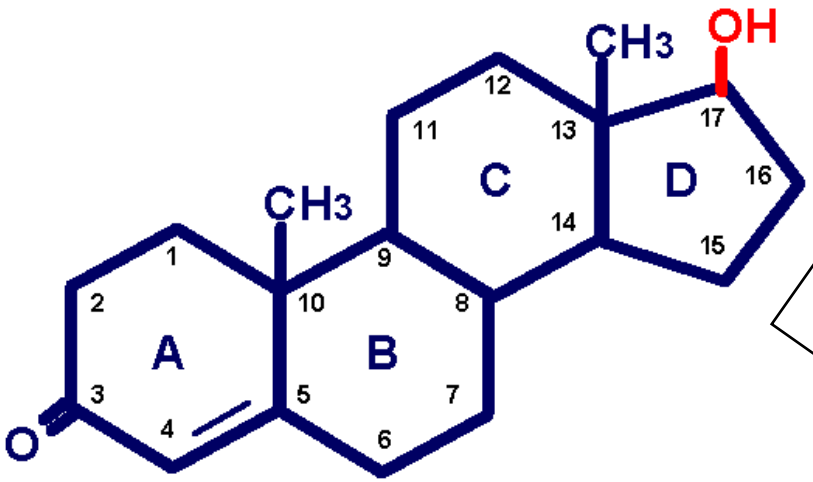
# Blood-Testosterone Level vs. Age




Typical Testosterone Declination for U.S. Males

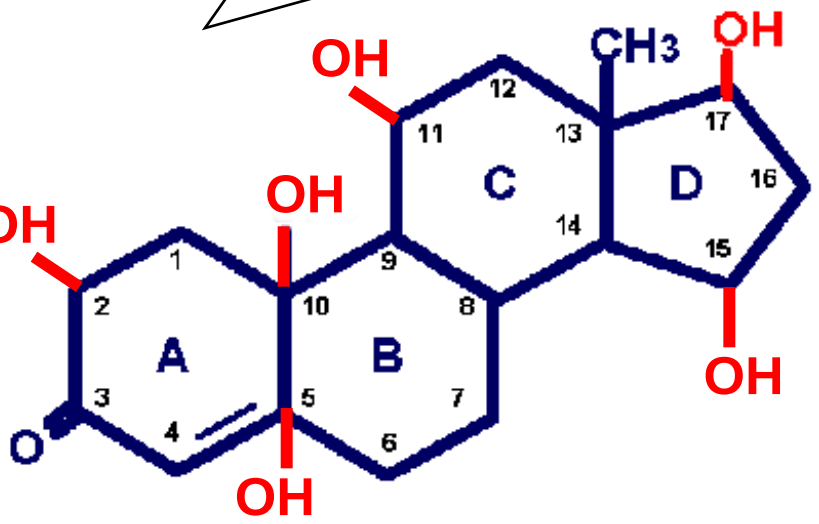
# Metabolism of TESTOSTERONE

# Testosterone




# Hydroxy 5, 11, 15, 19) testosterone

(2,



***Harper's Biochemistry*** **indicates that the metabolites of testosterone are then either conjugated by sulfation or glucuronidation.**

**Saw palmetto thickets provide excellent habitat for the eastern diamondback rattlesnake.**

# andropause

- Normal serum testosterone to estrogen ratio=50:1
- Some men with andropause=8:1
  - May have normal lab range of testosterone
  - But estrogen dominance=low testosterone

# Symptoms of andropause

- **Decrease in libido or desire for sex**
- **Decrease in spontaneous morning erections(most common early sign)**
- **Decrease in fullness of erections**
- **Difficulty in maintaining or starting full erection**
- **Spells of mental fatigue and inability to concentrate**
- **Depression**
- **Decreased initiative**
- **Muscle soreness**
- **Decrease in physical stamina**

# Signs of andropause

- Increase in total cholesterol or triglyceride
- Decrease in HDL cholesterol
- Elevation of fasting blood glucose
- Elevation in blood pressure
- Unexplained mid-section weight gain
- Increase in fat distribution in breast area and hips
- Development of varicose veins or hemorrhoids
- Changes in visual acuity

# Bone density and testosterone

- **Estrogen decrease osteoclast activity**
- **Testosterone, progesterone stimulate osteoblast activity**

# Prostate and testosterone

- Testosterone alone is not responsible for prostate hyperplasia
- estrogen,DHT(dihydrotestosterone)
  - induce BPH
- DHT production increased with 5-alpha reductase upregulation
- Excess estrogen produced from testosterone and androstendione from the up-regulation of the aromatase
- Treatment focus-down regulation of 5-alpha reductase and aromatase

# Androgen physiology

- Hypothalamus-gonadotropin-releasing hormone(GnRH)
- GnRH stimulate anterior pituitary gland to secrete lutenizing hormone(LH) and follicule stimulating hormone(FSH)
- LH-primary stimulus for the secretion of testosterone by testes
- FSH-stimulate spermatogenesis

# Male salivary hormone profile

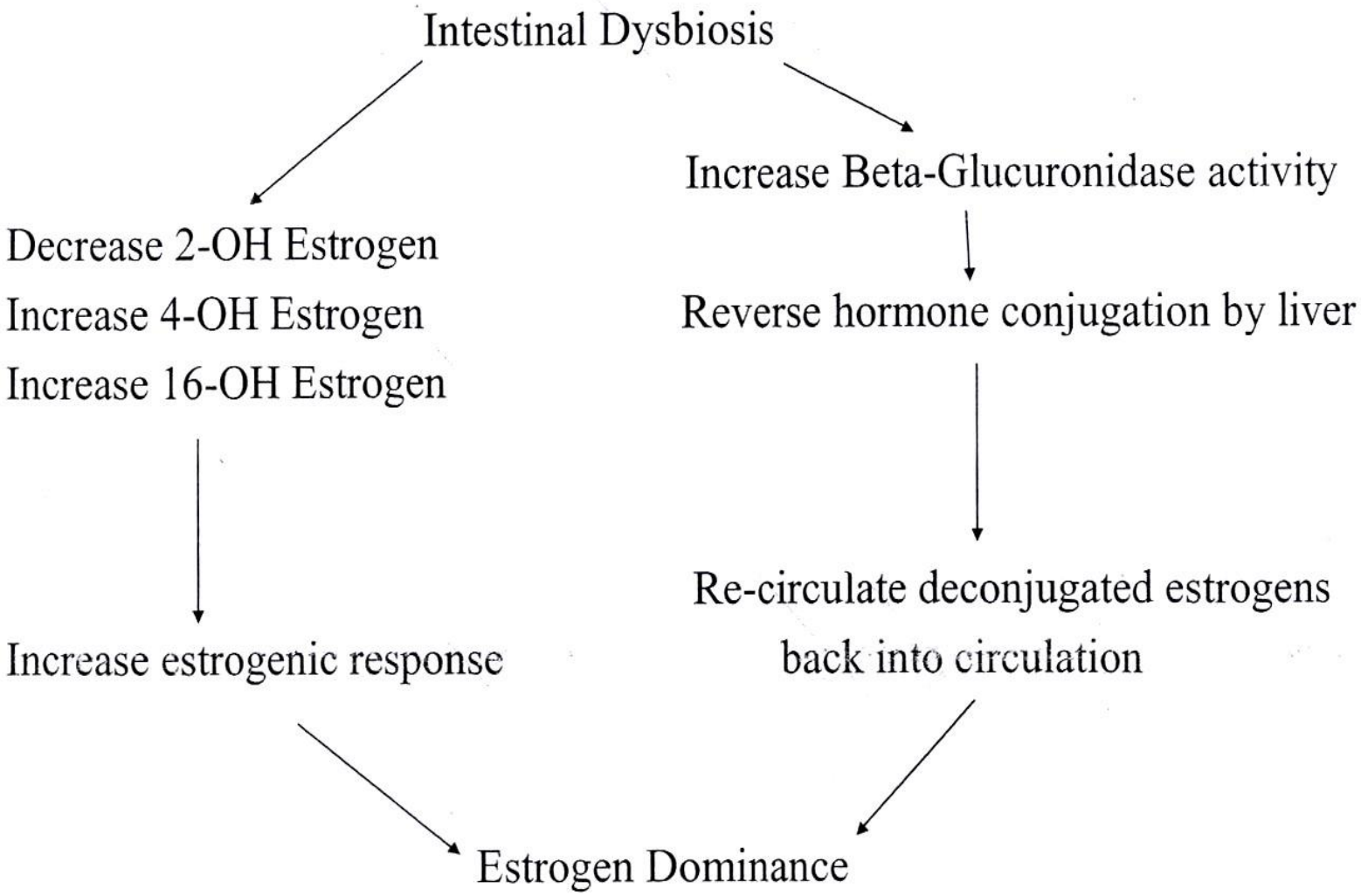
- Increased LH, increased FSH with low testosterone=primary hypogonadism
- Decreased LH, decreased FSH with low testosterone=secondary hypoganadism
- Increased DHT=up-regulation of 5-alpha reductase or exogenous intake of precursor
- Increased DHEA=exogenous intake of DHEA or other hormones
- Decreased DHEA=pregnenolone steal from adrenal stress syndrome

- **Increased androstenedione=up-regulation of 17,20 lyase or exogenous intake of androstenedione or precursor(DHEA)**
- **Elevated estrogen=up-regulation of aromatase or exogenous intake of estrogen or precursors(DHEA,androstendione, progesterone, testosterone)**
- **Elevated progesterone=exogenous intake**
- **Low progesterone=usually result of adrenal stress syndrome shunting the available progesterone into cortisol**

# Nutritional protocols for andropause

- **Liver detox**
- **Estrogen metabolism**
- **GI microflora activity**
- **Insulin insensitivity**
- **Adrenal function**
- **Testosterone synthesis**
- **5-alpha reductase activity**
- **Beta glucuronidase activity**
- **17,20 lyase activity**
- **Aromatase activity**
- **Feedback loop with the pituitary and the hypothalamus**

# Estrogen Dominance and GI Dysfunction

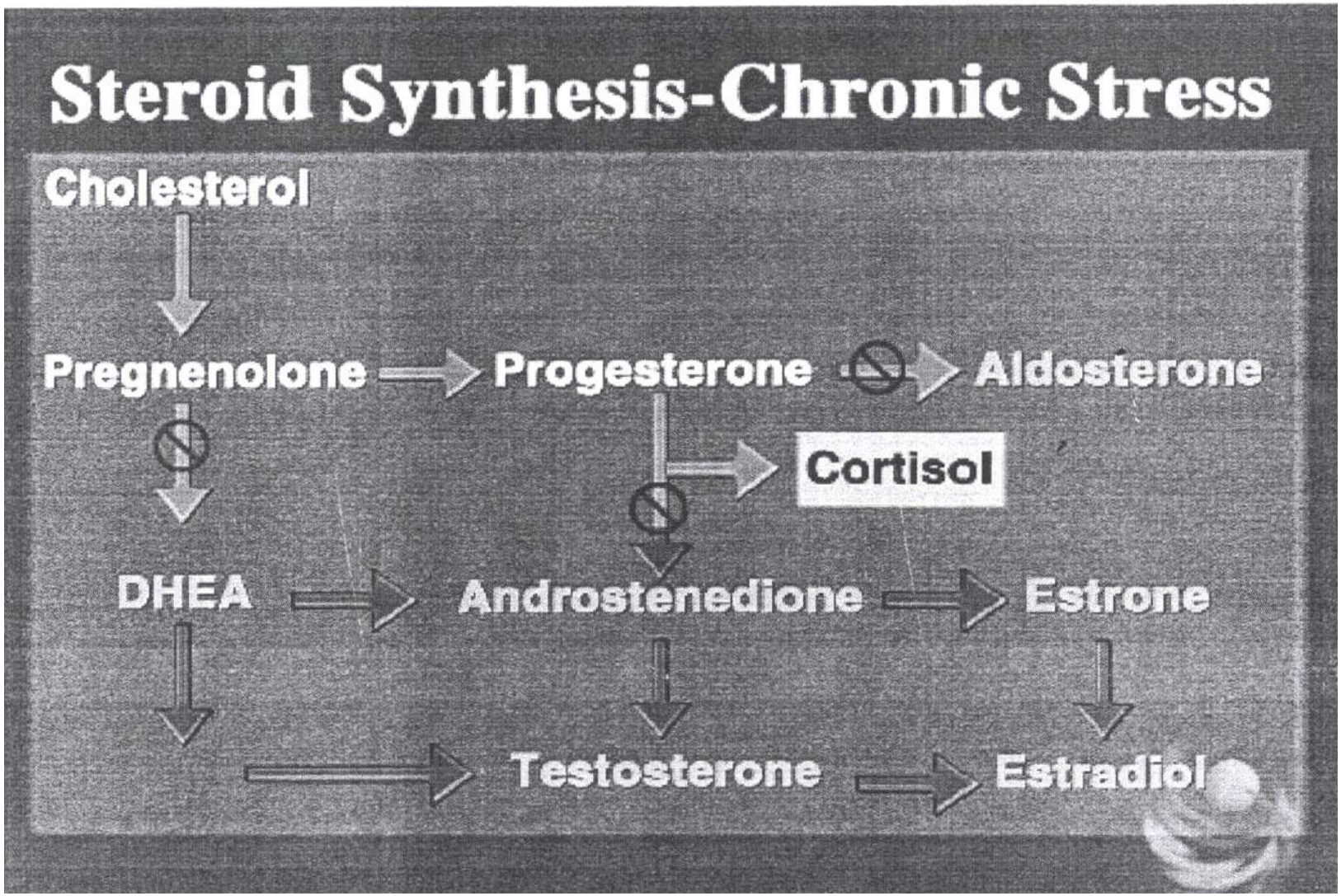


# Down-regulate 5 alpha-reductase

- **Elevated 5 alpha-reductase**
  - **BPH**
  - **Male baldness**
  - **Hair thinning**
- **Avoid high CHO**
  - **Diets high in CHO(>70%) stimulate the conversion of testosterone into DHT**
  - **Diets low in CHO(<44%) inhibits 5 alpha R**
- **Increase zinc intake and enhance utilization**
  - **Zinc absorption depends on HCL**
  - **Elevated estrogen suppress zinc uptake**

- Enhance essential fatty acid
- Avoid pesticides
- Herbs that suppress DHT
  - Saw palmetto(serenoa repens)
  - Pygem africanum
- Rule out and correct low progesterone
  - Abnormal progesterone in males are always due to adrenal dysfunction
- Rule out and correct elevated estrogen
  - isoflavones

# Pregnenolone Steal



# Summary of andropause