

新竹台大分院新竹醫院耳鼻喉部
第五次頭暈讀書會

臨床神經眼科學

中國醫藥大學新竹附設醫院

陳瑩山醫師 11/06/2021

中國醫藥大學新竹附設醫院



你在看我嗎？

眼神

Eye Sight



神經系統的精神性器官

5 Senses



視覺使用度佔每日五大感官的60%

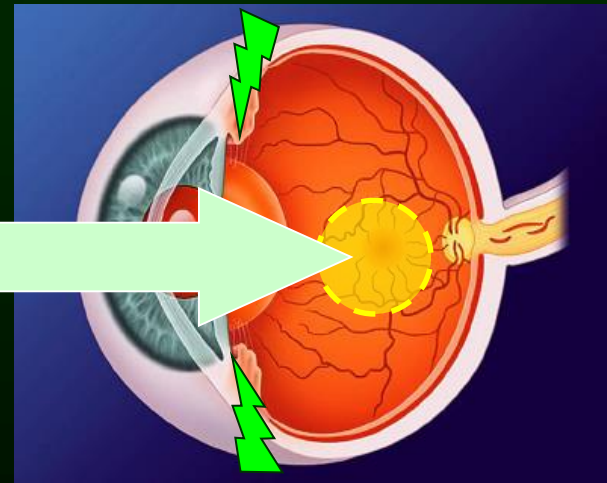
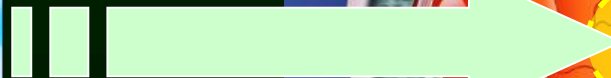
眼睛在神經系統中有什麼特色？

A. 受光

B. 有肉

手機是最完美的最佳代言

Ciliary Muscle Contraction



讓眼科醫師有飯吃

手機與手電筒一樣嗎？

手機



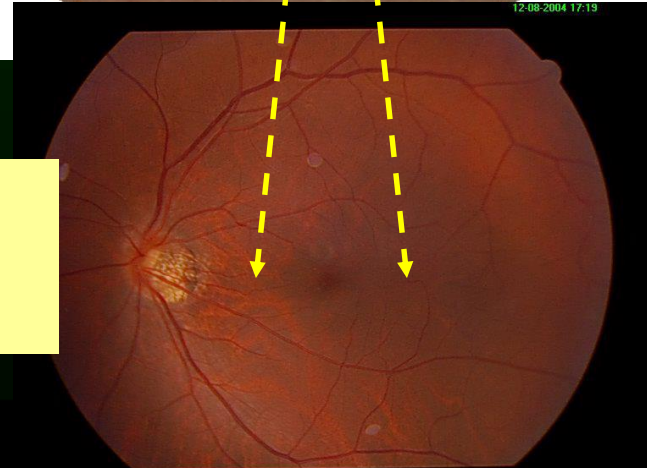
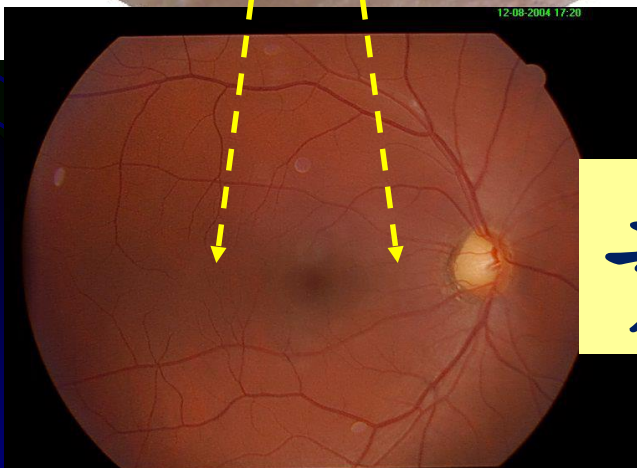
面對光源
直射光入眼 長時間使用

手電筒



順著光源
無直射光入眼之問題

進入瞳孔的光線到哪裡？



黃斑部

How Visual Brain work?

底層的肌肉永遠為神經服務

A. Boss : Visual Center(枕葉視覺中樞)

Visual Center

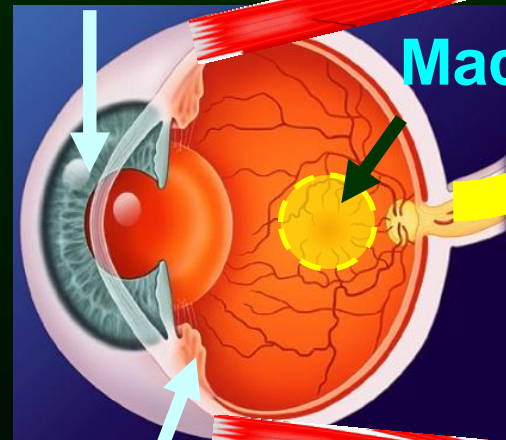


B. CEO: Macula(黃斑部)

C. Manager: Eye Muscles(眼肌)

1. 瞳孔肌 Pupil Muscle
2. 睫狀肌 Ciliary Muscle
3. 眼外肌 Extra Ocular Muscle

Pupil Muscle



Macula

Optic Nerve

Ciliary Muscle

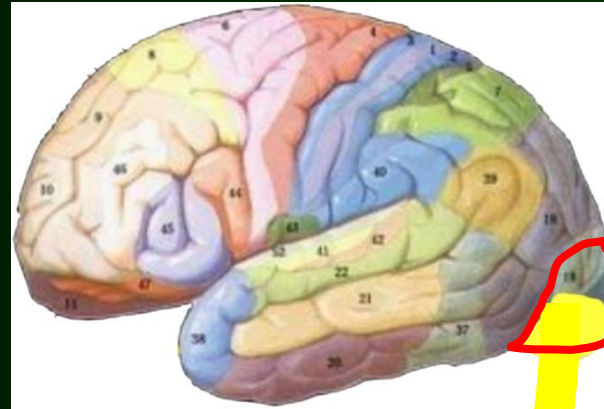
Extraocular Muscle

Energy Consumption(能量消耗) during 3C

Normal

Brain:

腦部耗能約佔身體20%



Visual Brain

3C

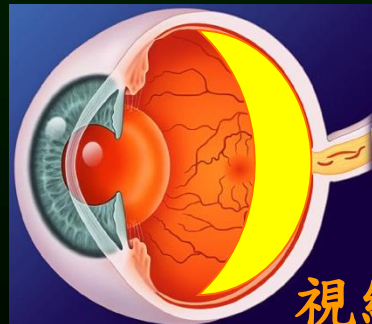
Thinking:

思考時腦部耗能增30%↑

視神經

Eye:

耗能最重在眼睛



視網膜

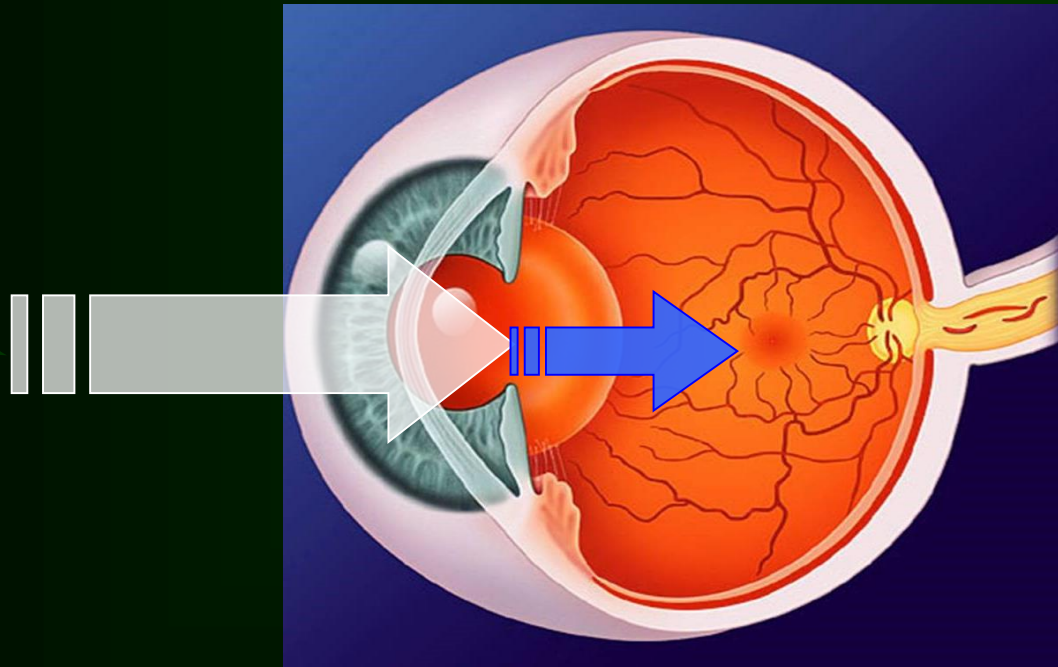
Reading:

閱讀時眼部血流增加30%

光線如何成像？

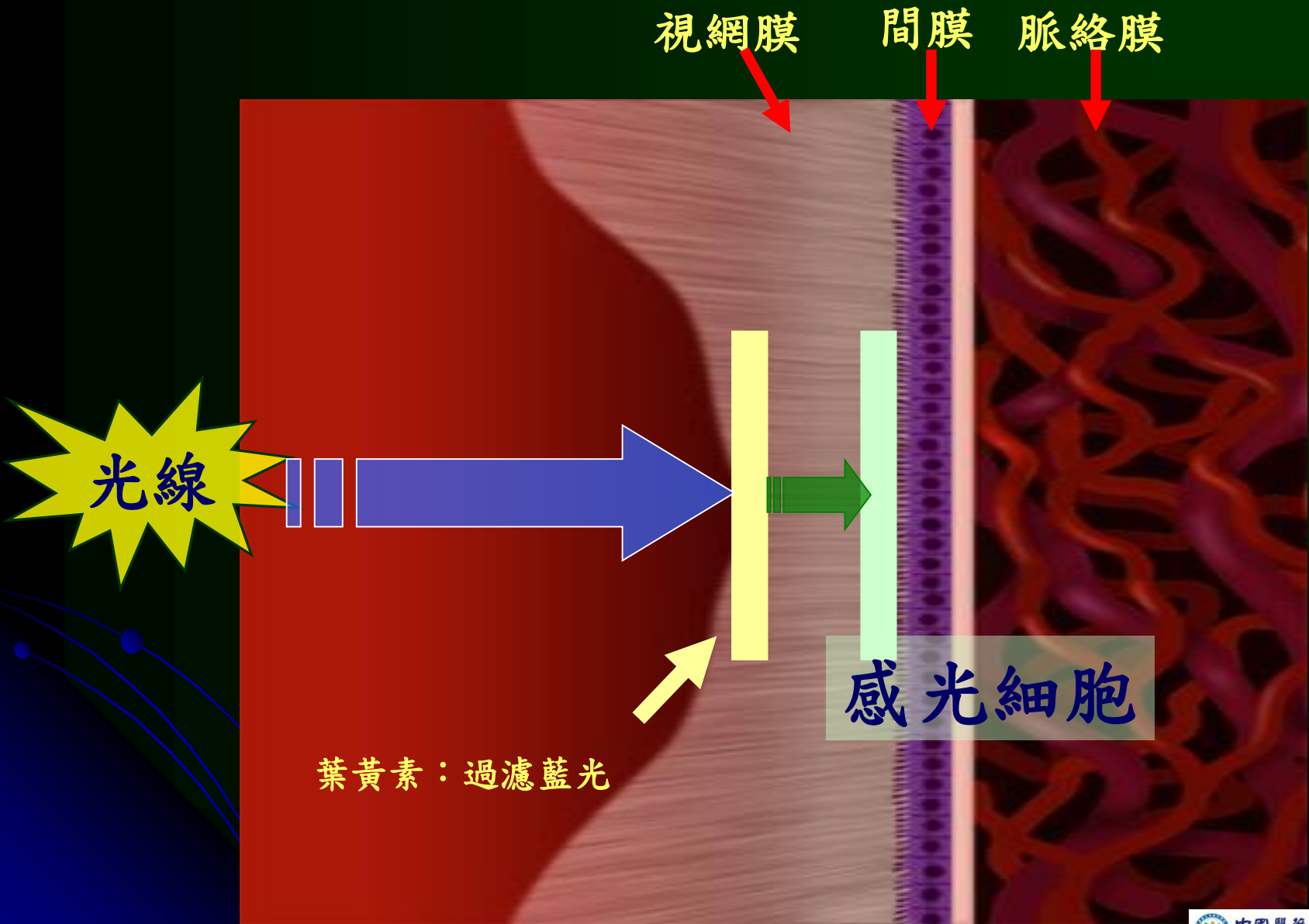
角膜、水晶體吸收紫外光

光線

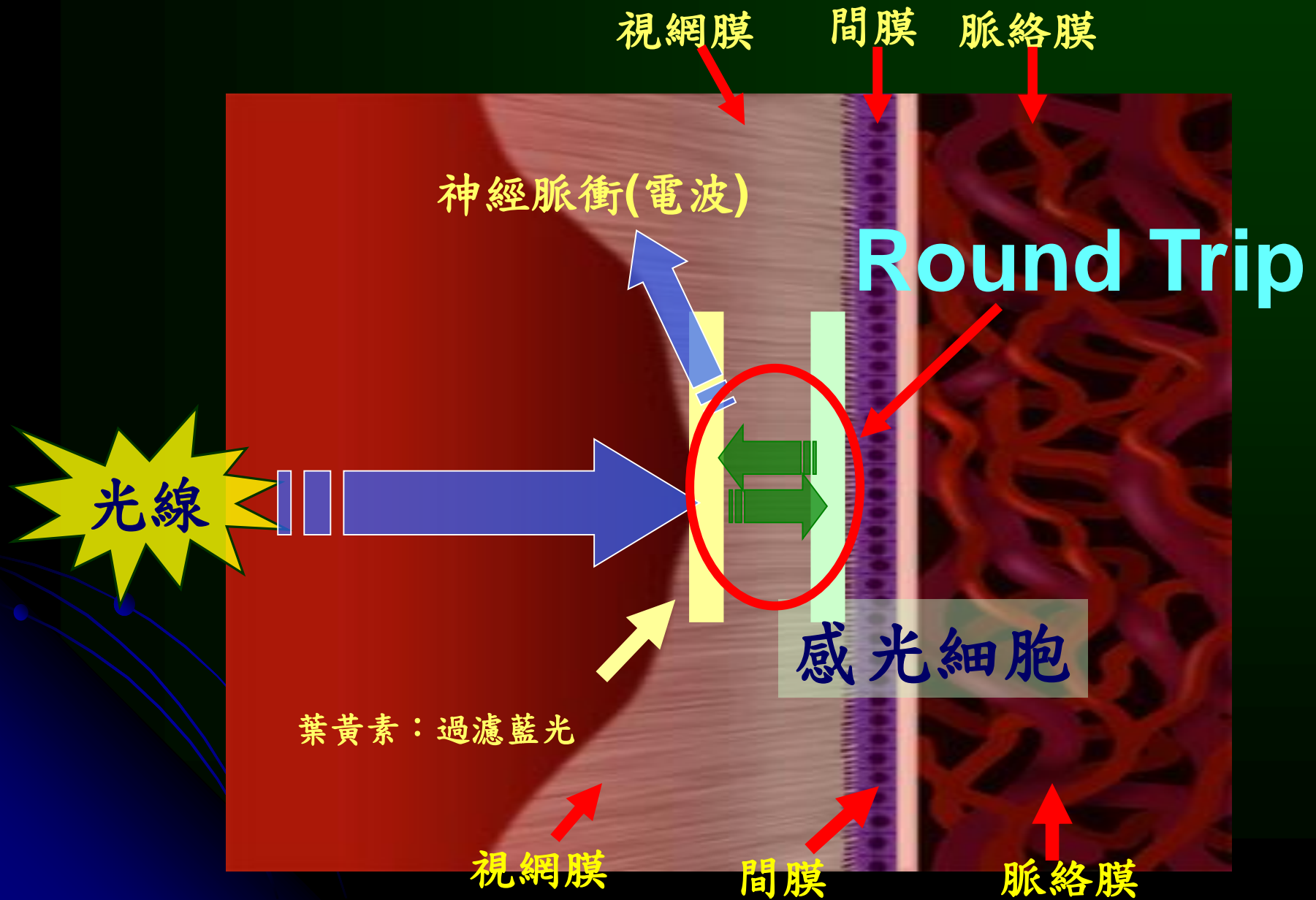


可見光進入眼底

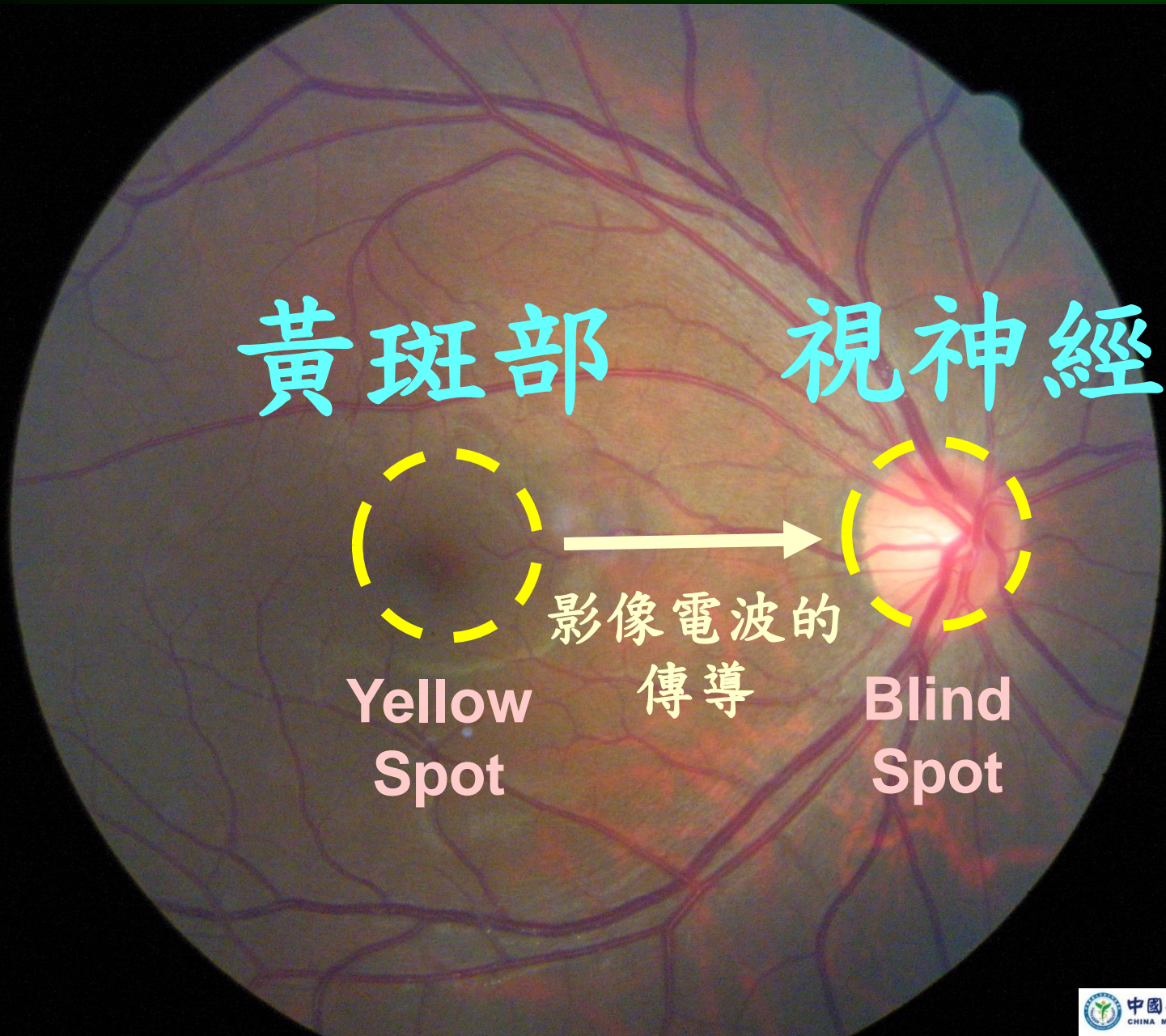
光線如何成像？



視覺的缺陷



視覺的缺陷-盲點



瓢蟲測試

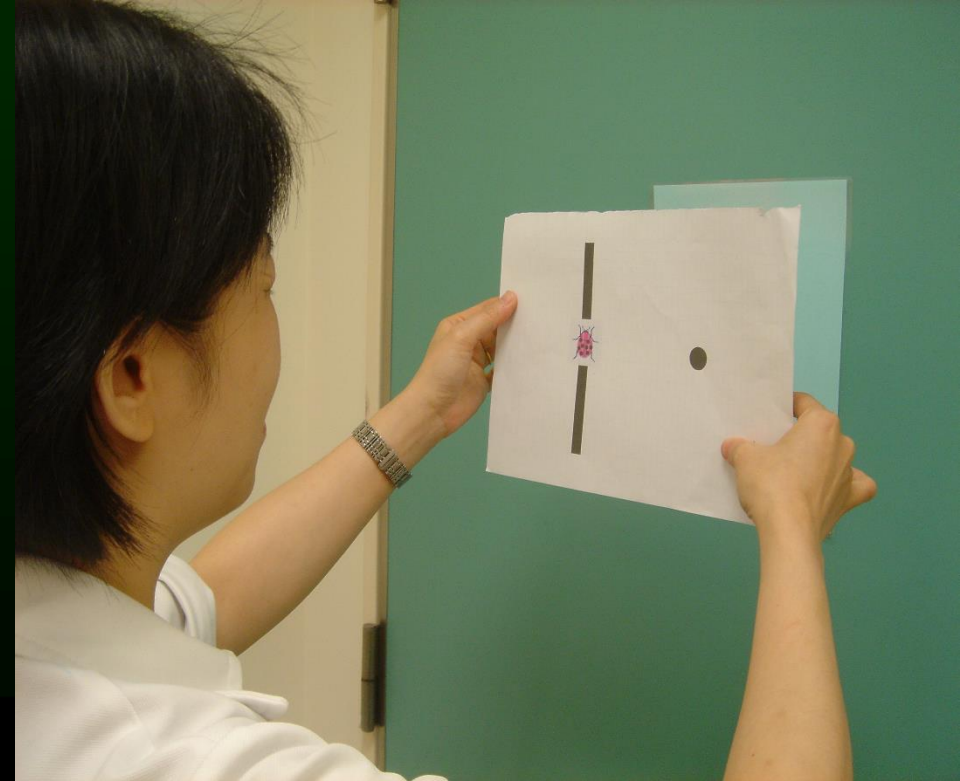
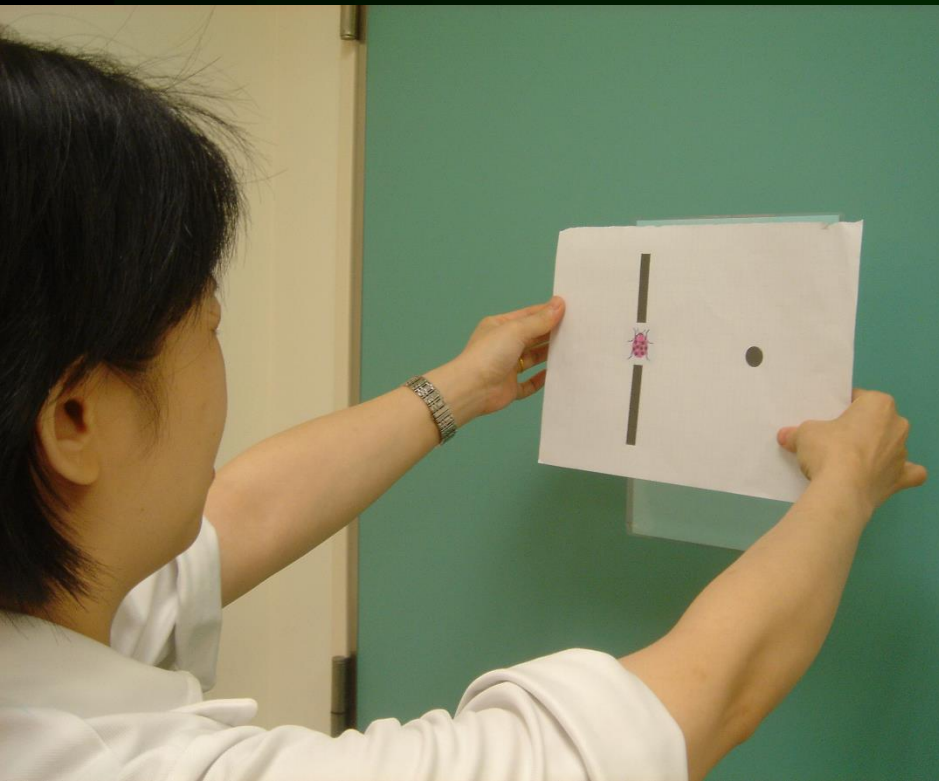
瓢蟲哪裡去了？



請看講義

瓢蟲不見了嗎？ 直線連起來了嗎？

閉右眼 左眼直視黑點 紙張由遠至近



Why seeing is tired?

Stupid, it is muscles induced.

—not by Bill Clinton

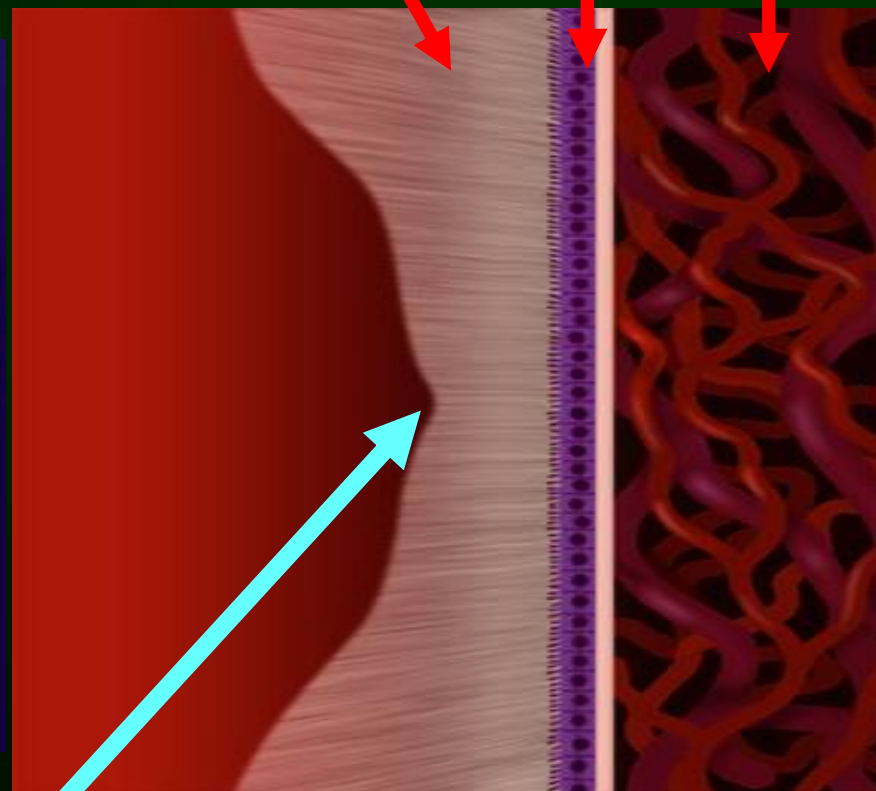
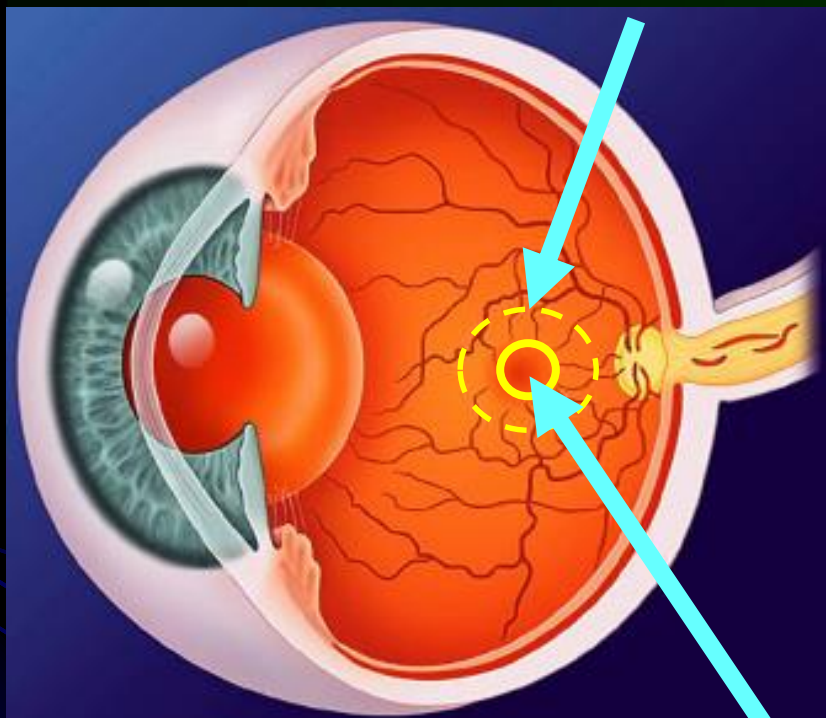
什麼是肌肉症狀
(Muscle Symptom)?

痠、麻、脹、痛

中心凹的地理位置

黃斑部

視網膜 間膜 脈絡膜

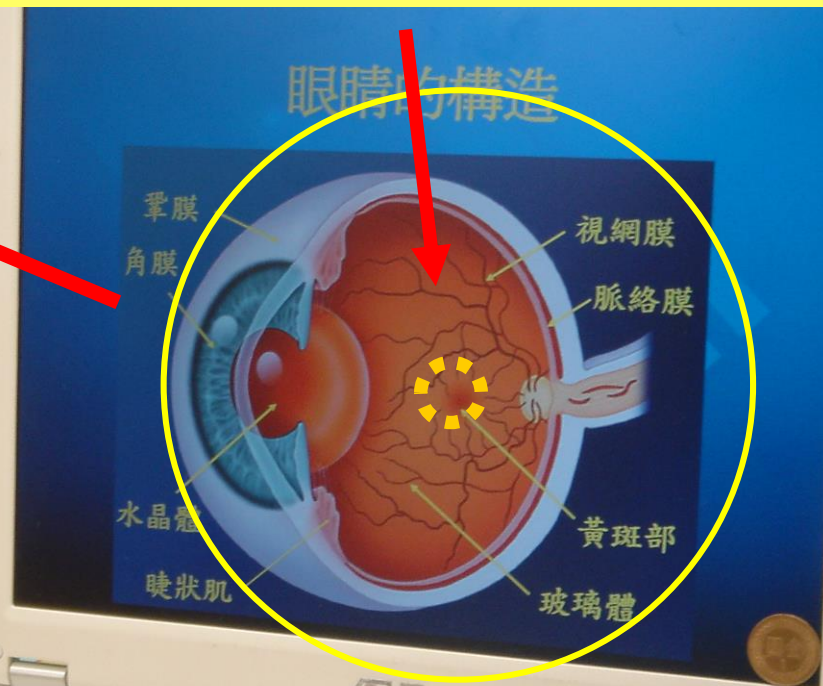


中心凹

當您打開電腦時

中心凹(閱讀時你真正想看的地方)

中心視角 20°



中心凹主司：固視

固定目標的視力。固視不良，看書、看雜誌會跳字跳行。車上無法看書。

環境影響固視：眩暈

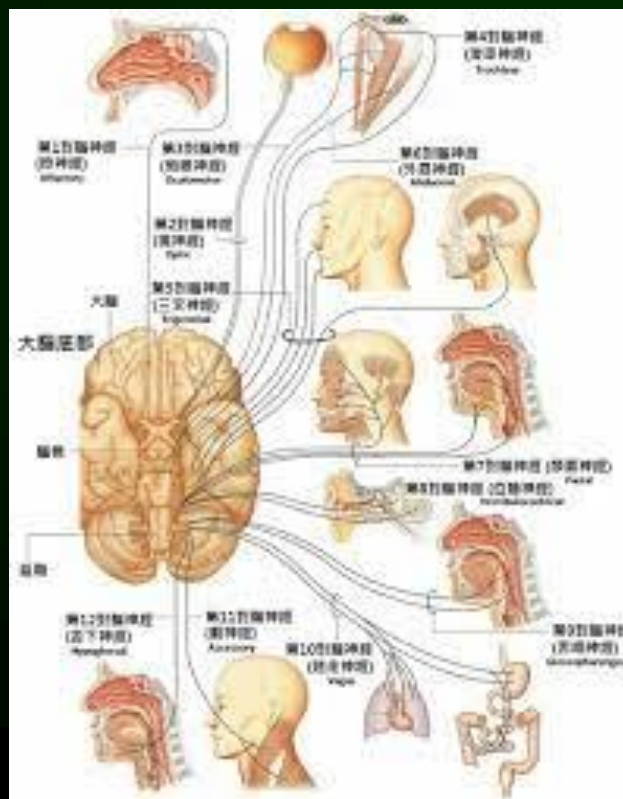


Why Muscles Alignment(排列對準) is Complicated?

Central Nervus System:

12對腦神經

4對與vision協調有關

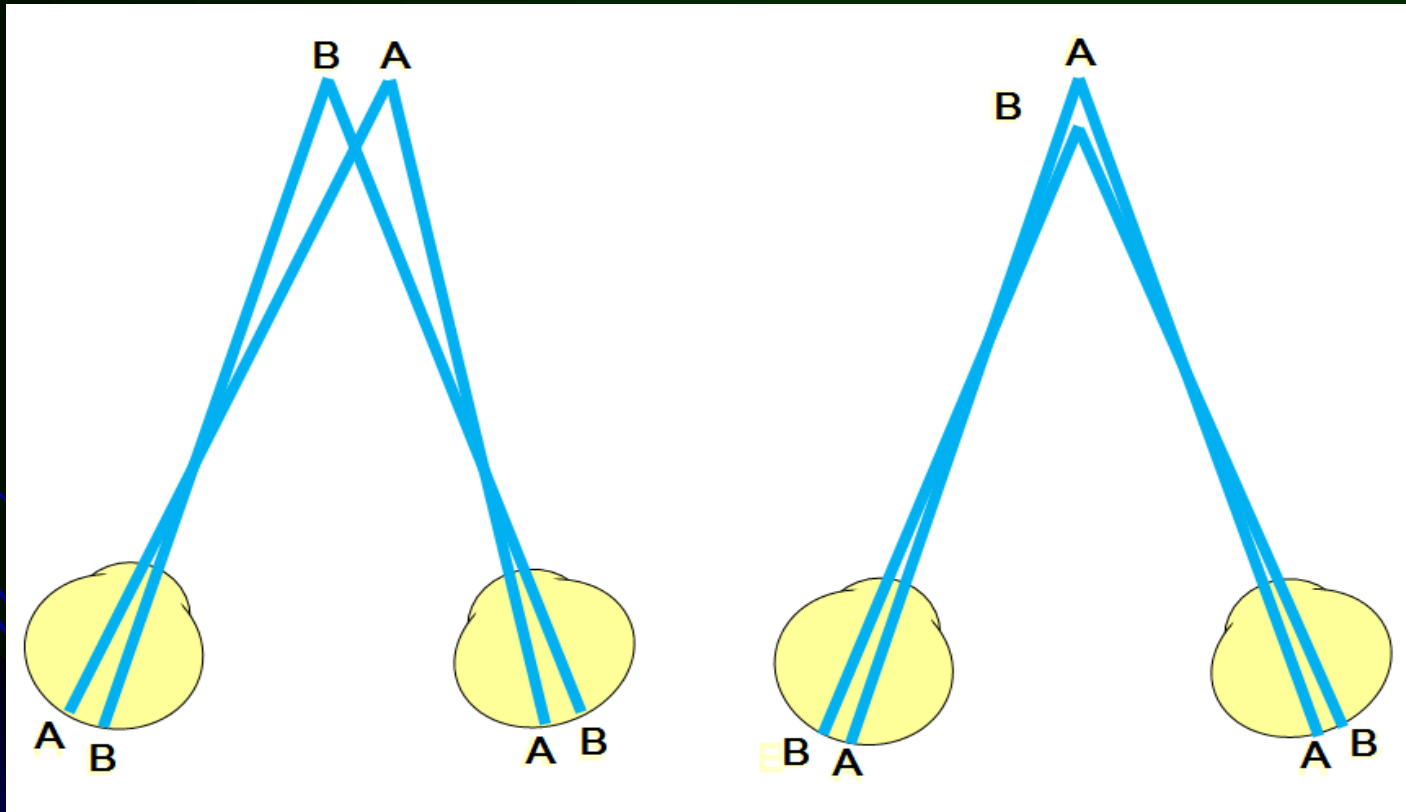


Fusion(融像) is Complicated, that's why Fusion is Tired

NRC:

Normal Retina Correspondence

正常視網膜相對應

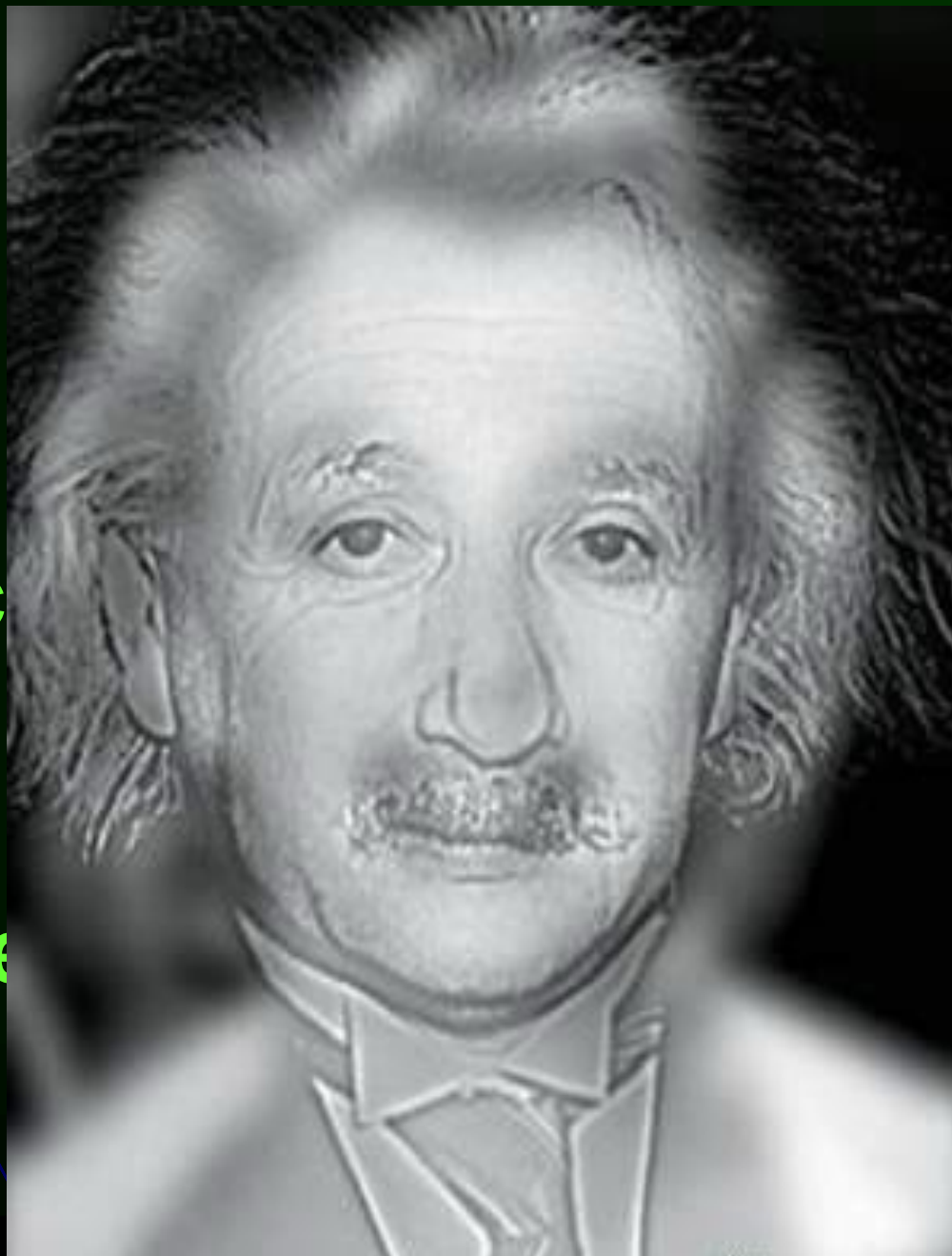


Fusion

ry tired

Confuc

Shakespe



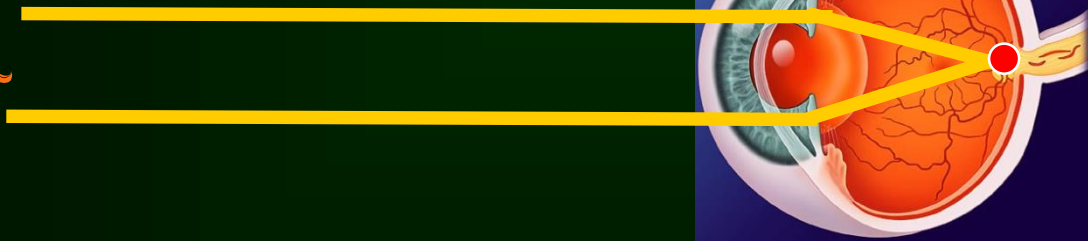
**vision
ground**

天生我眼(Eye borned for Far) (1)

為什麼眼球是圓的？

凸透鏡聚光

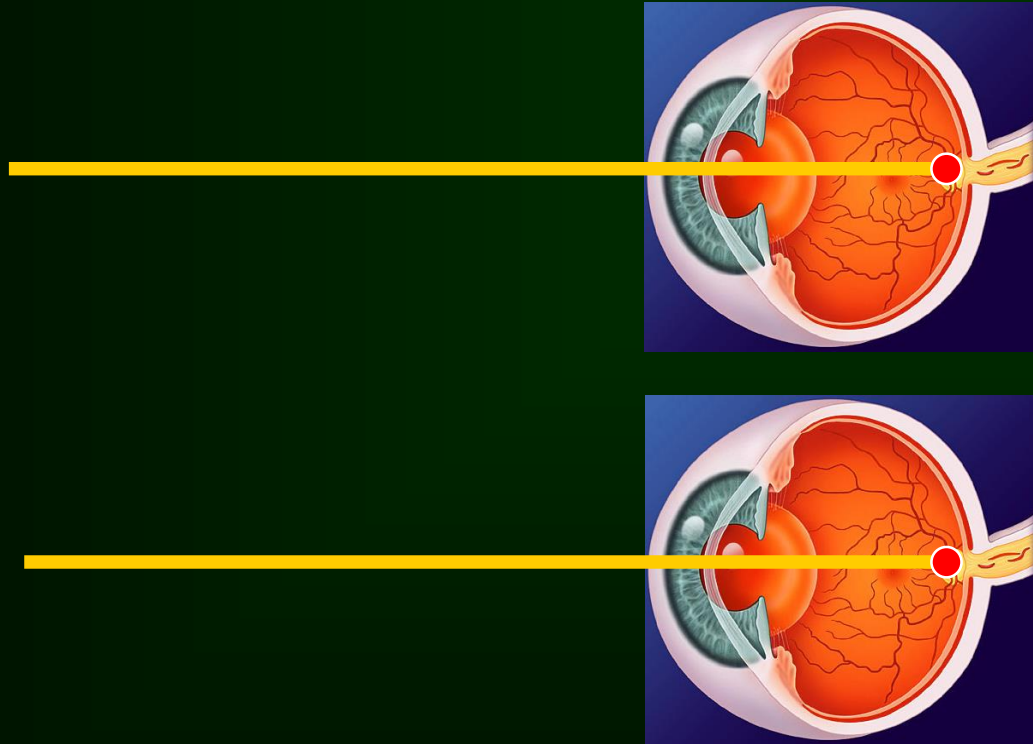
Far



遠處平行光不費力可聚光

天生我眼(Eye borned for Far) (2)

Far

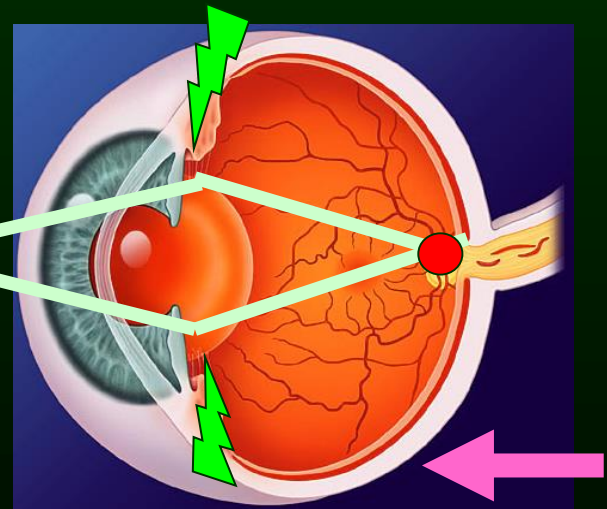


雙眼平行看遠很舒適

目標物靠近激起近反射(1)

調節 Accommodation (by ciliary muscles 睫狀肌)

Near

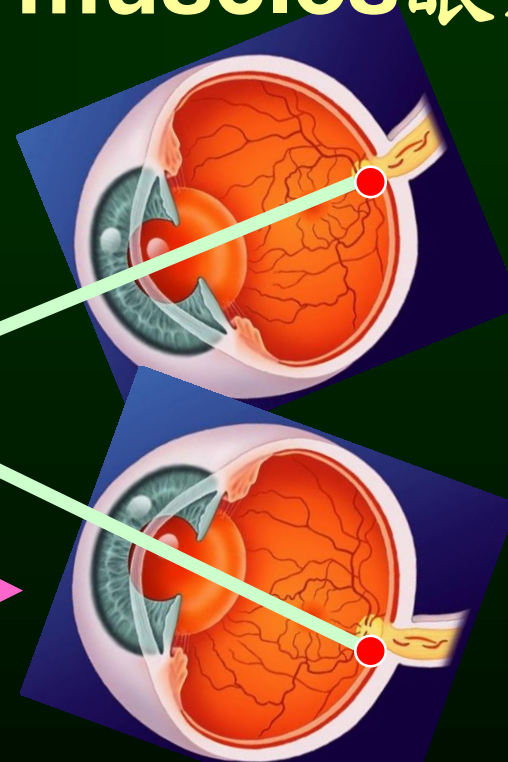
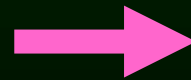


決定 focus

目標物靠近激起近反射(2)

內聚 **Convergence**
(by extraocular muscles 眼外肌)

Near



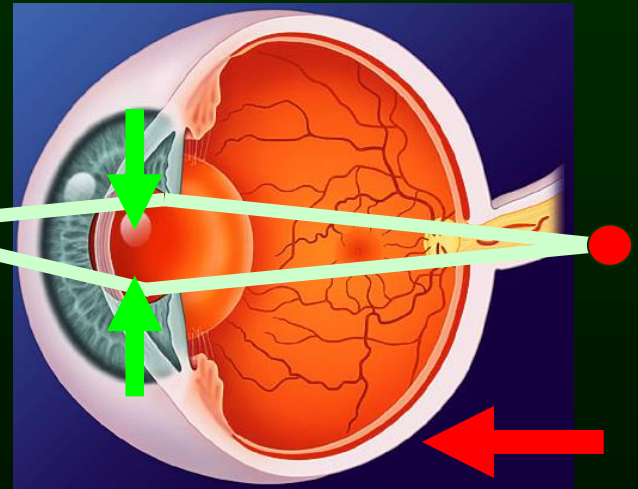
決定雙眼單影像

BSV (Binocular Single Vision)

目標物靠近激起近反射(3)

縮瞳 Pupil constriction (by iris circular muscles 瞳孔肌)

Near



決定景深(depth of focus)

During 3D(雙眼立體視), All Muscles Contract and Finally Get Tension and Tired

Miosis

雙眼立體視

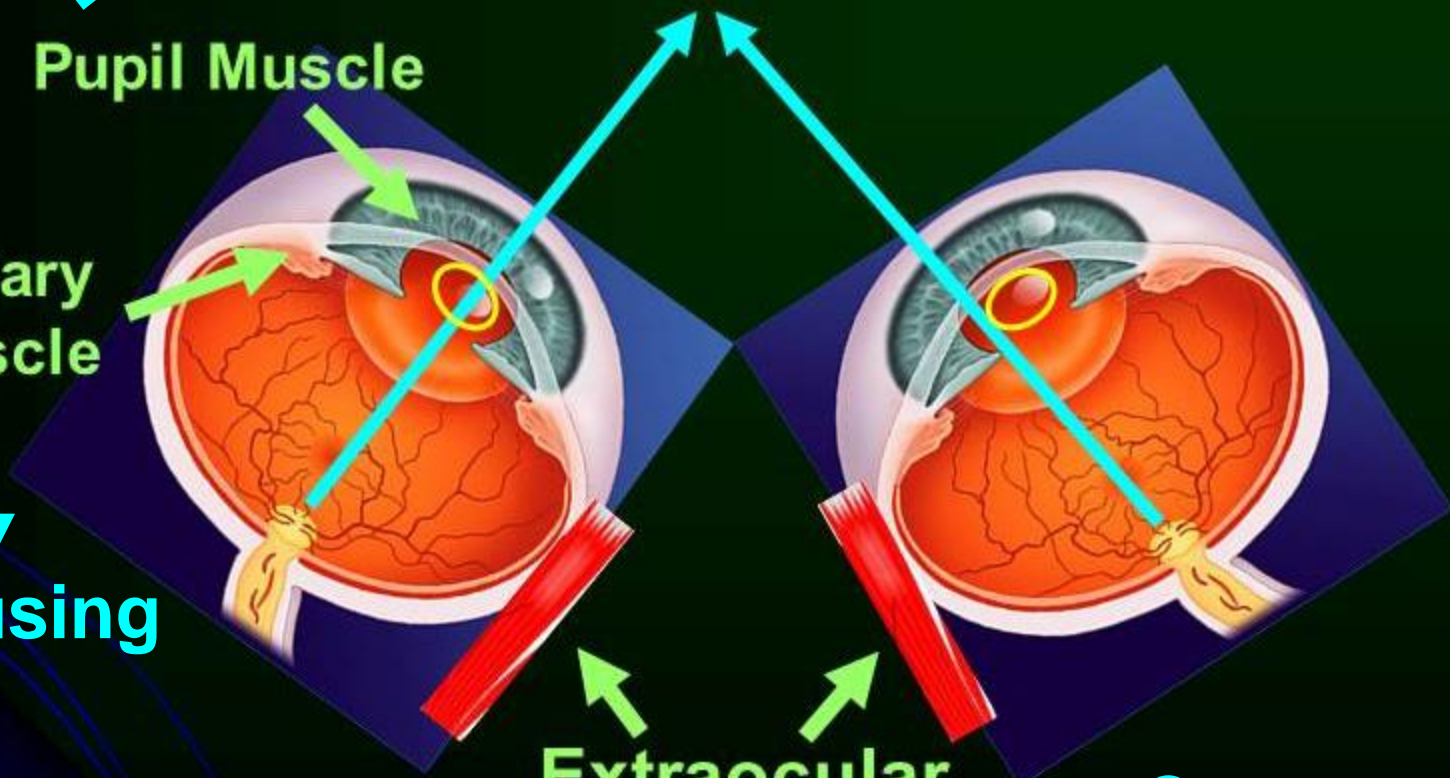
Pupil Muscle

Ciliary Muscle

Focusing

Extraocular Muscles

Convergent

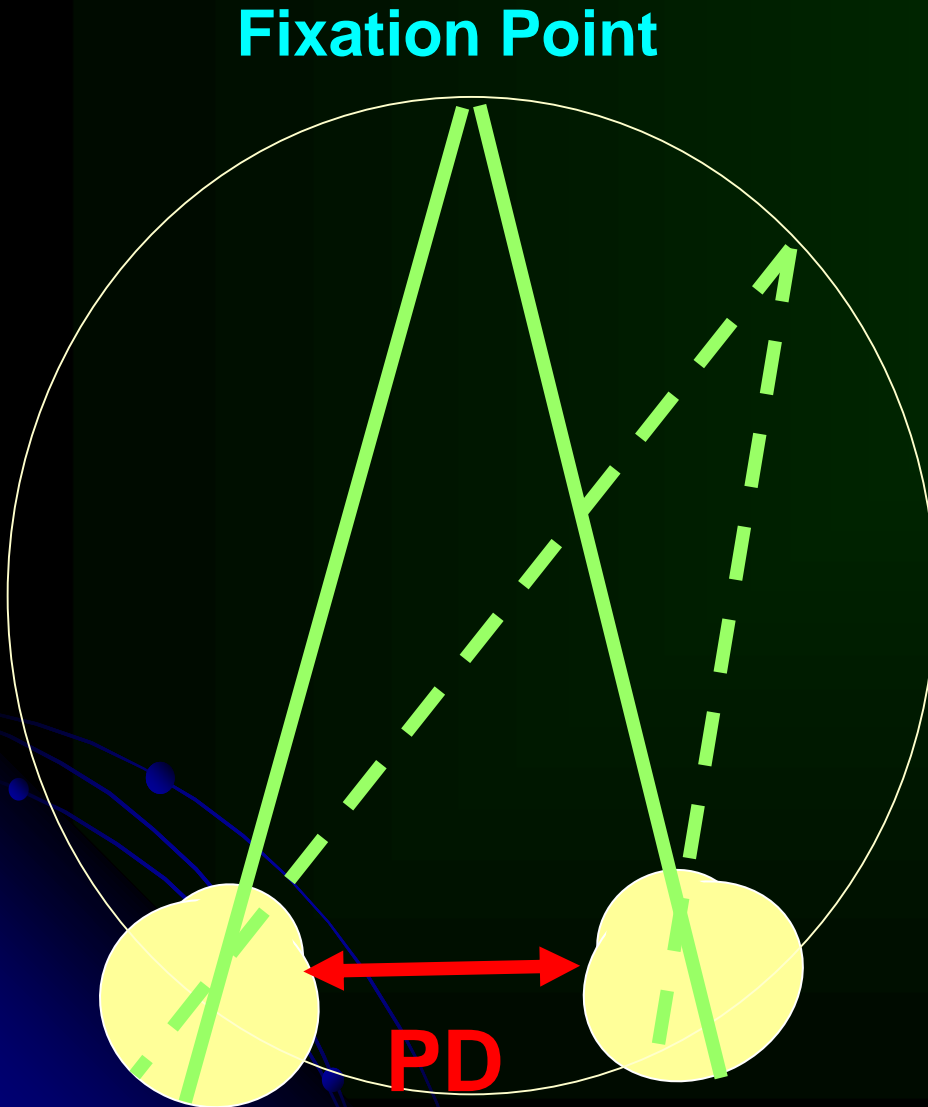


慣用眼(Dominant Eye Test)

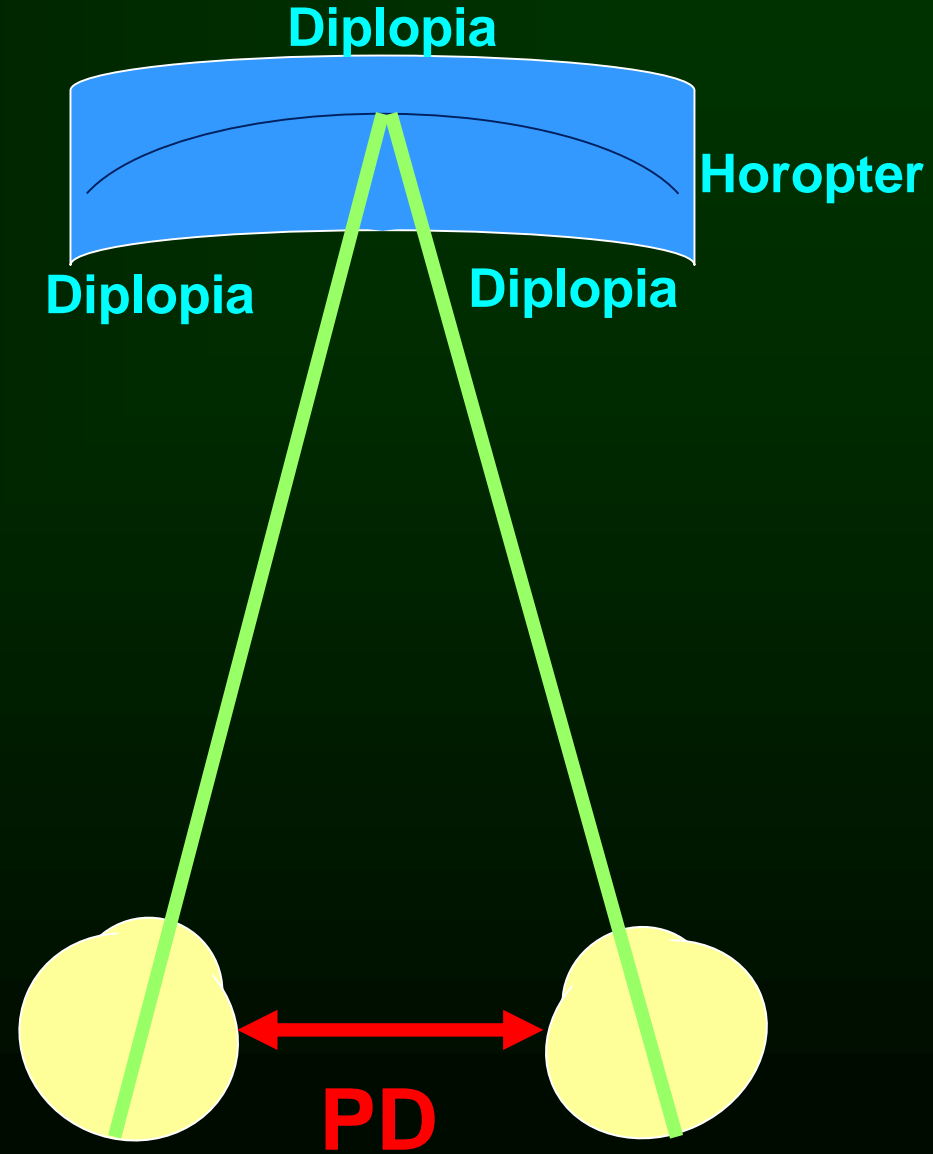


Normally, we don't need 3D
in most of our daily life.

Horopter(雙眼單視界) See as in a same plane



Pannum Space(視野單像區) interpreted as in 3D



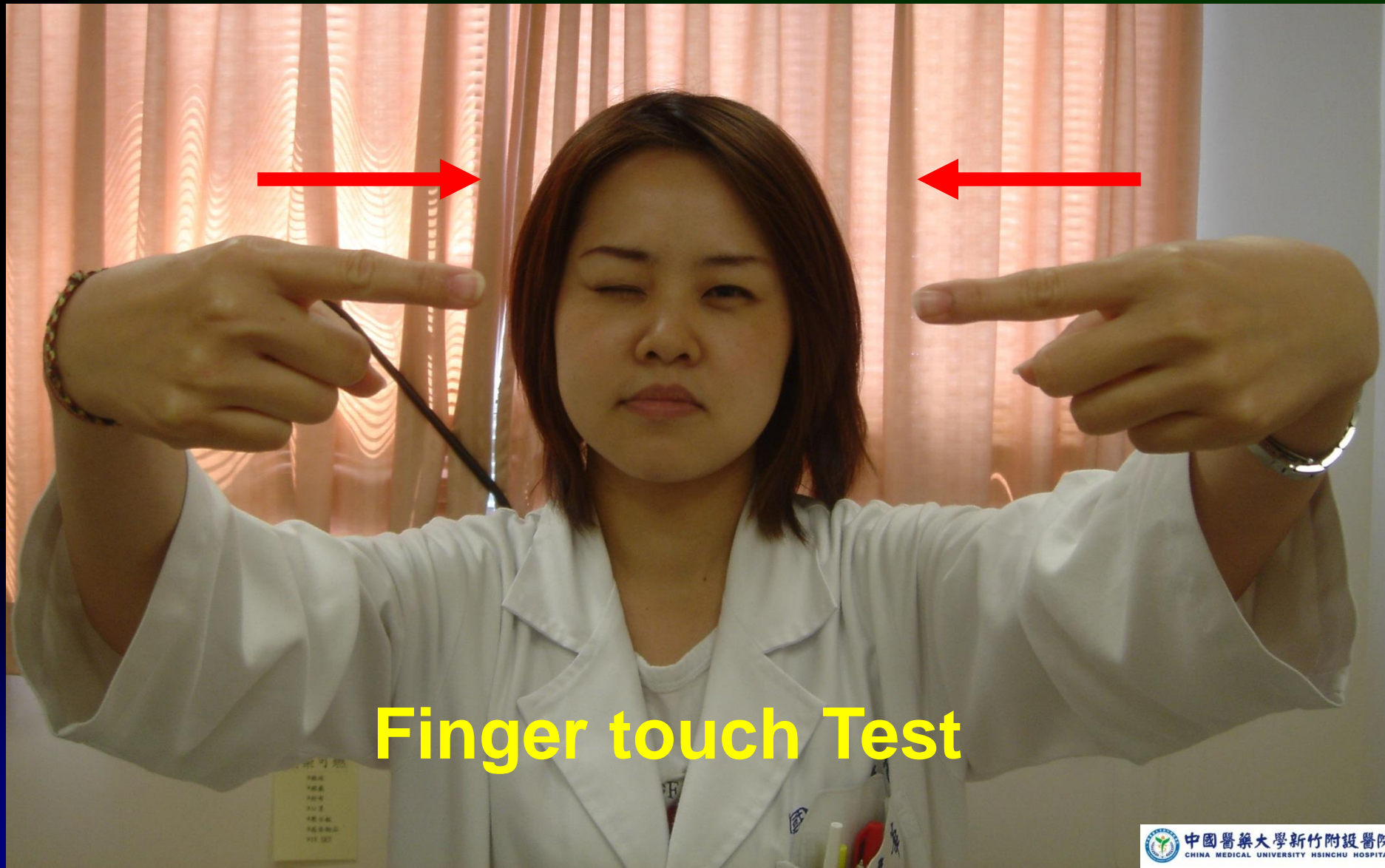
Pannum Space的臨床意義

攝影機

人眼



雙眼同視(有瞳距)

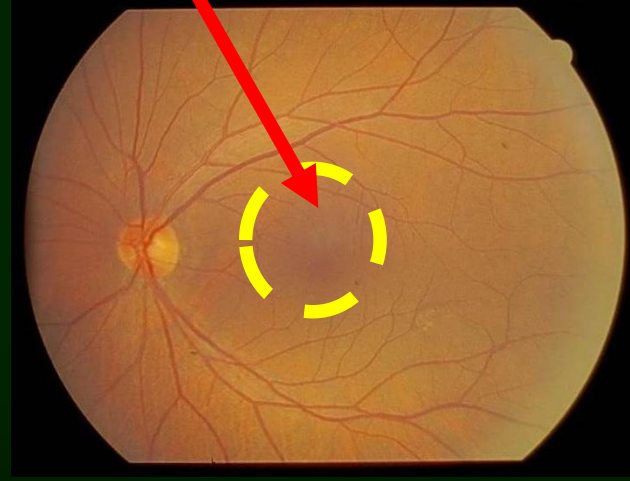
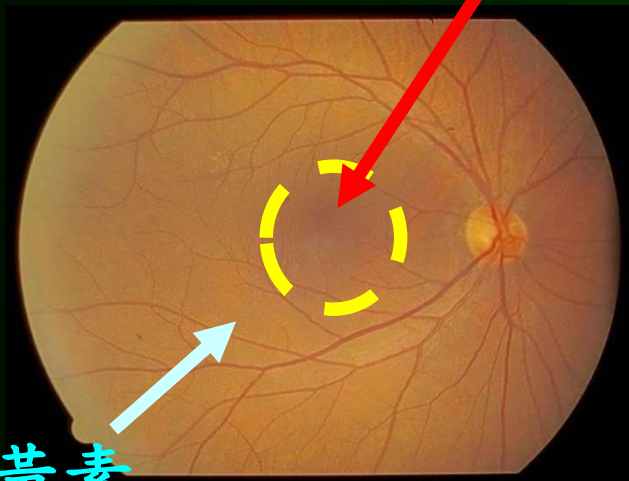


Finger touch Test

感覺視網膜的極致

黃斑部

雙黃成3D



富含葉黃素

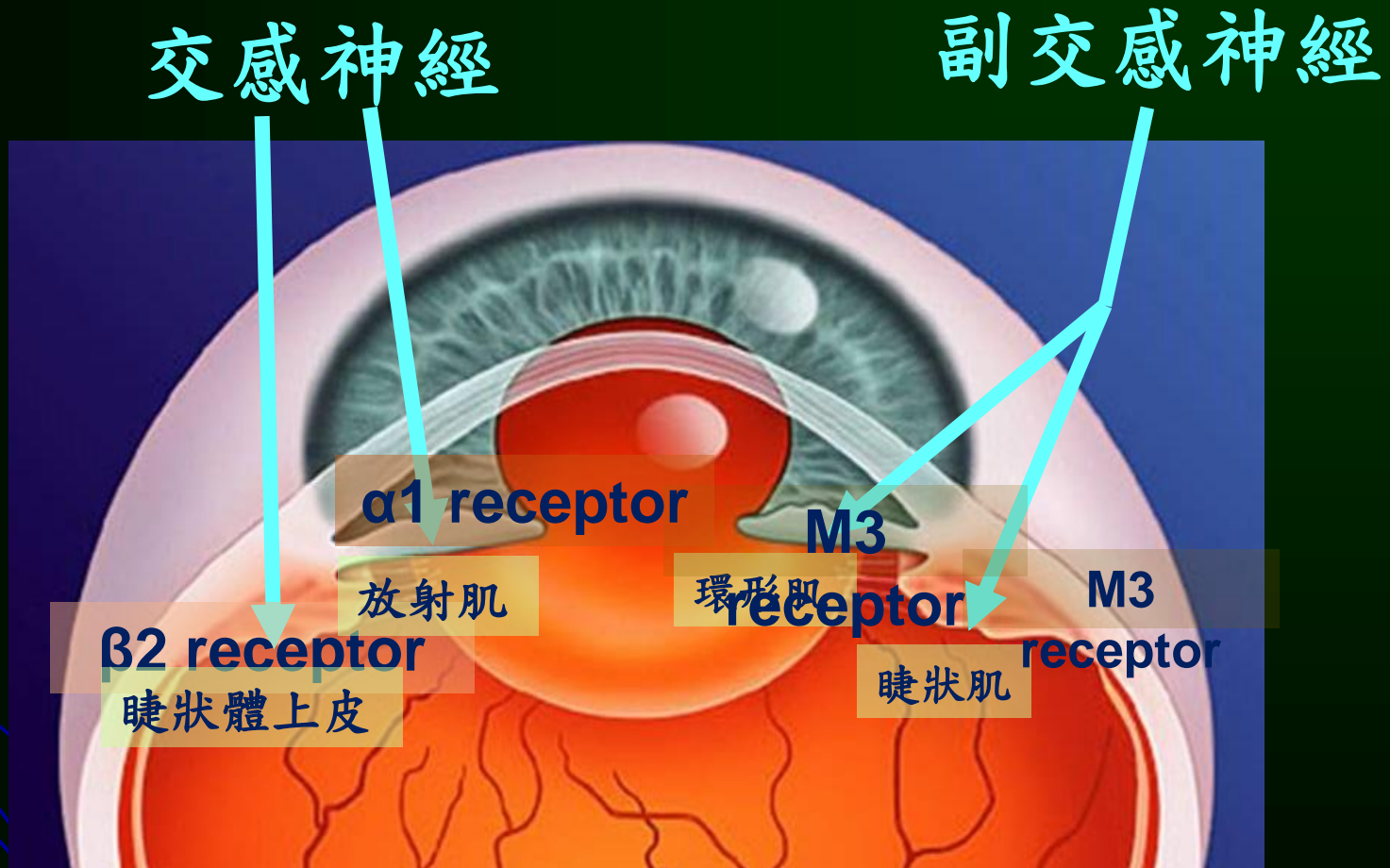
「Double York」

雙黃蛋



瞳孔肌及睫狀肌的神經控制

動作器之接受器



瞳孔的神經控制

CNS

脊柱

中腦(E-W核)

交感神經

副交感神經

3rd N.

5th N.
(三叉神經)

放射肌收縮

環形肌收縮

(動眼神經)

頸上神經節

睫狀神經節

睫長神經

睫短神經

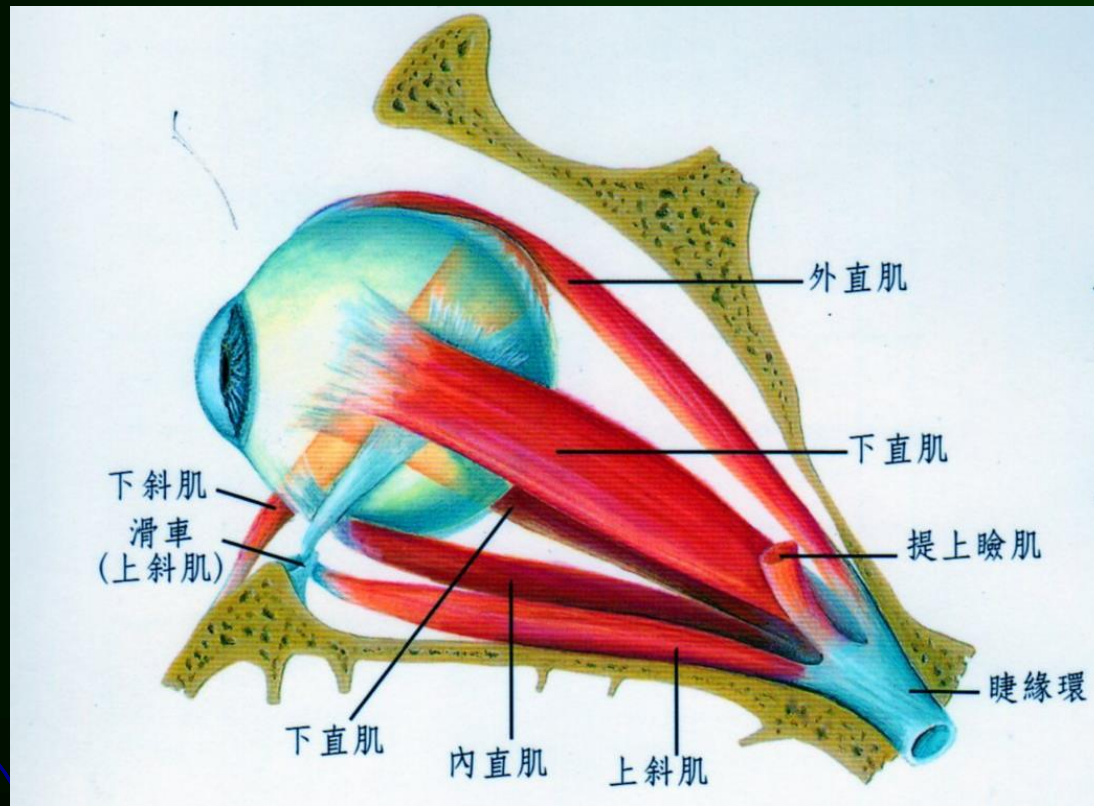
也至睫狀肌

散瞳

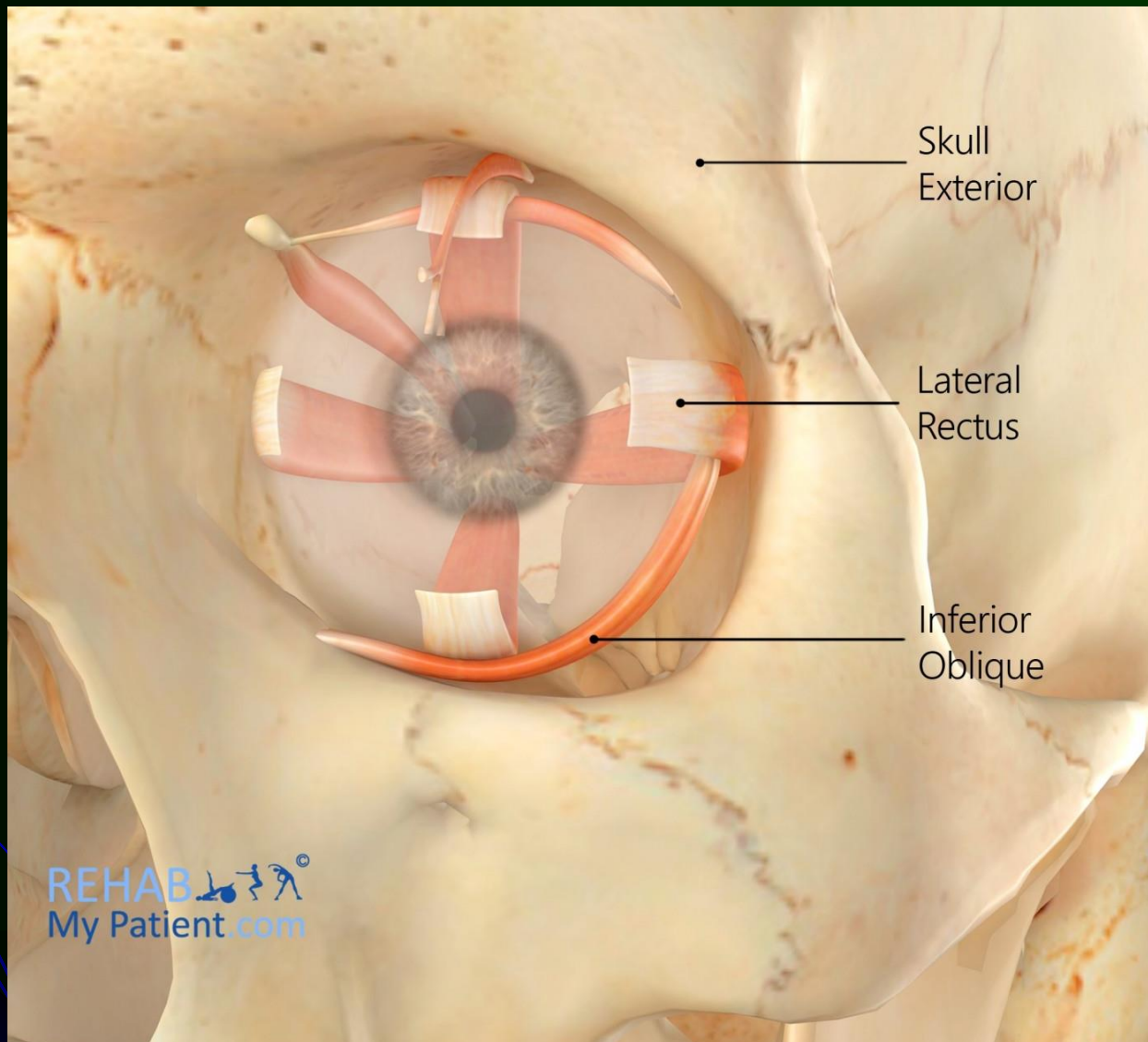
縮瞳

What is extra ocular muscles?

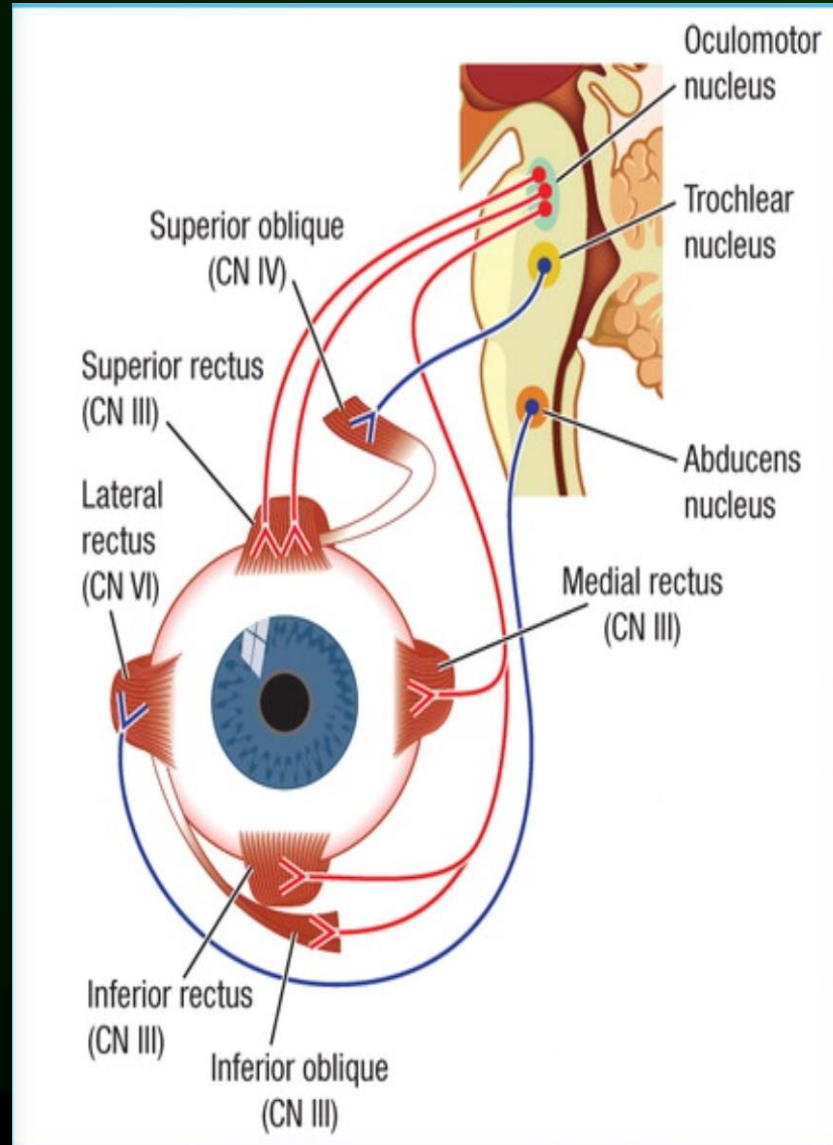
雙眼6對:4直+2斜
(上下左右+上斜、下斜)



肌肉為神經服務 運動為感覺服務



6對肌肉主要由第3對動眼神經控制 (除第4對(SO)和第6對(LR))



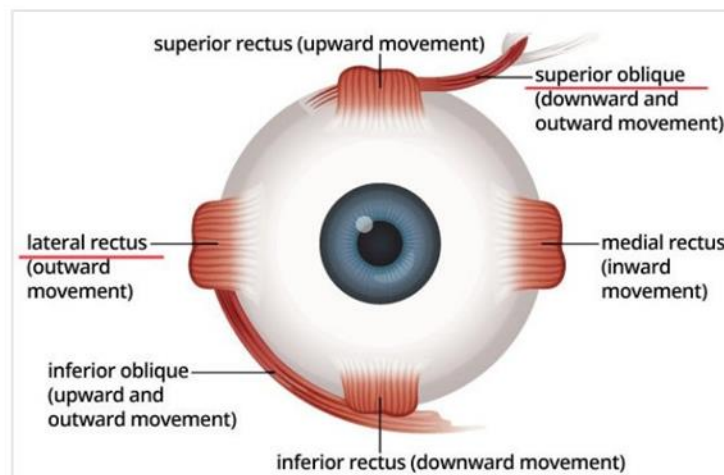
Nerve supply of Extraocular muscles

SO4 LR6

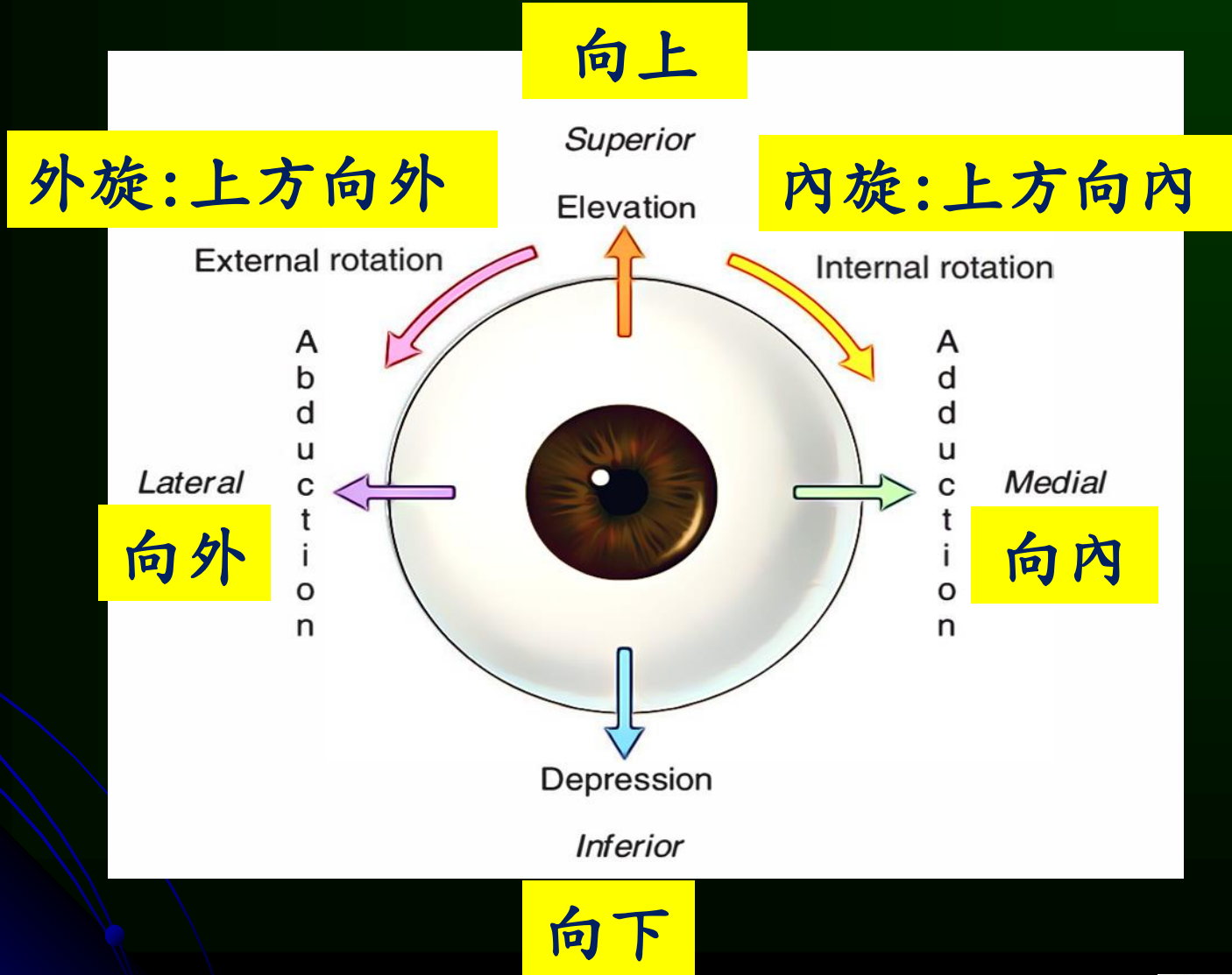
Superior Oblique → CN IV (Trochlear)

Lateral Rectus → CN VI (Abducens)

All other → CN III (Oculomotor)

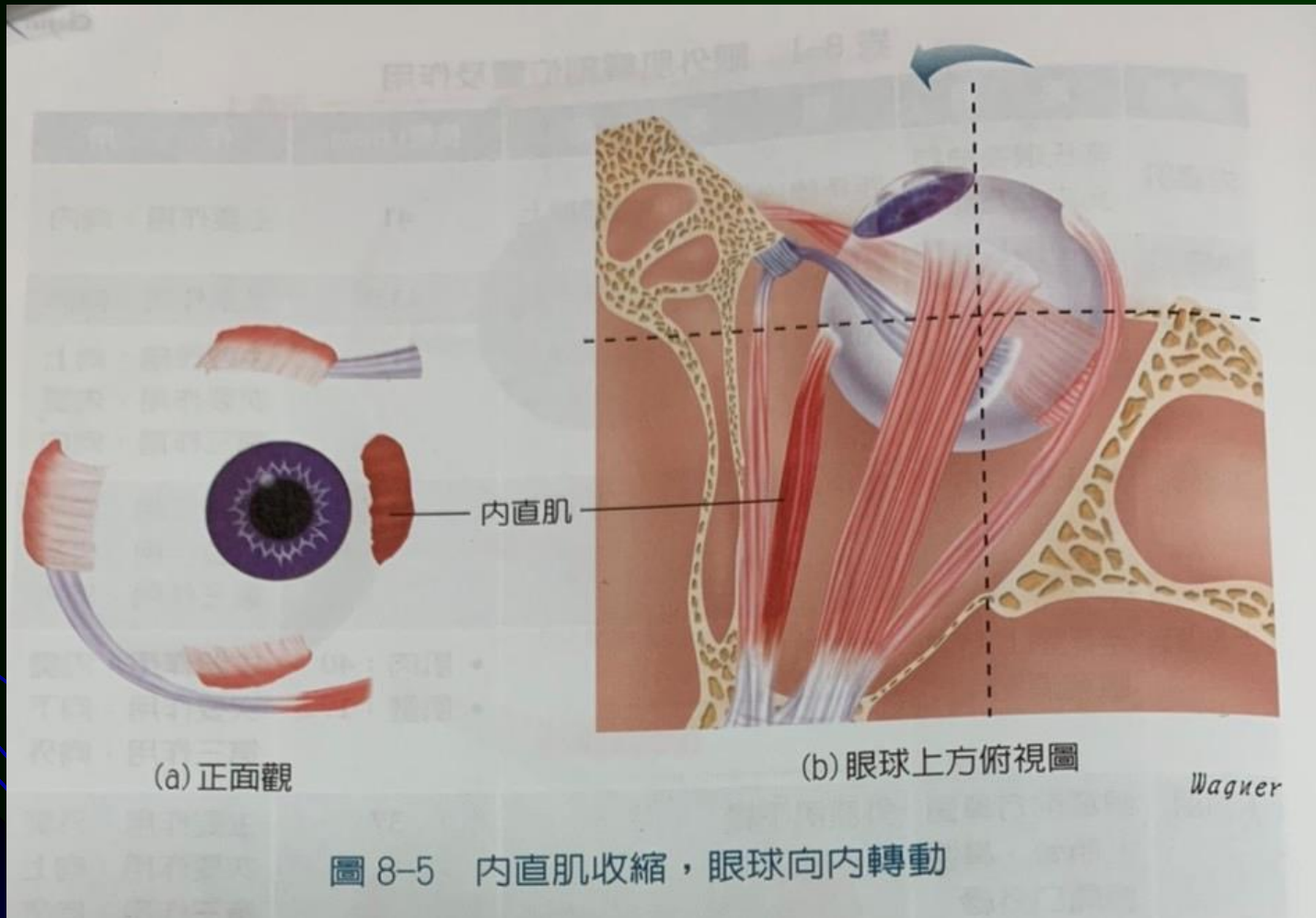


眼肌運動的方位(六方位)



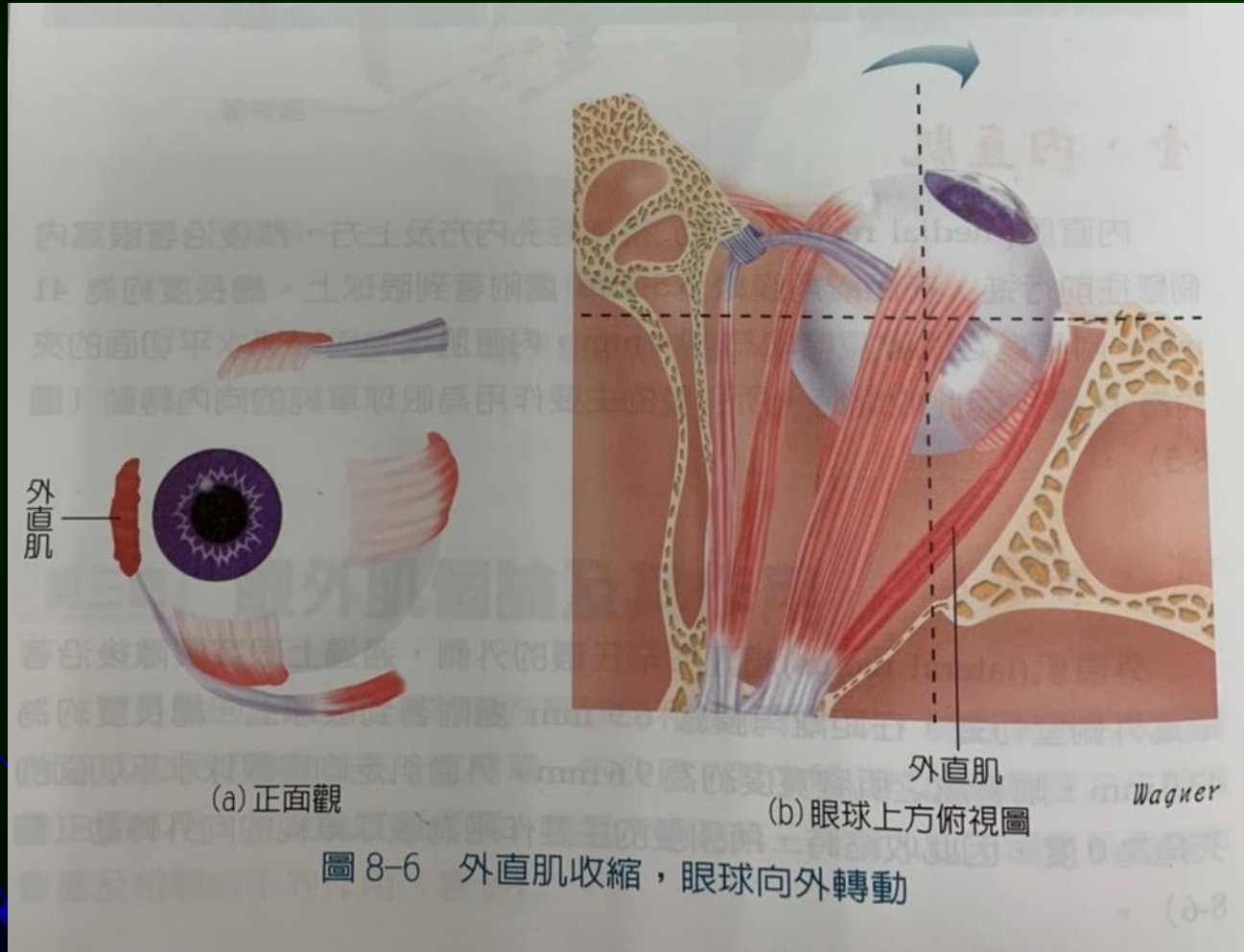
內直肌(MR, Medial Rectus)

單純向內



外直肌(LR, Lateral Rectus)

單純向外



上直肌(SR, Superior Rectus)

Insertion: 上、外、前

→ 上、內、內旋

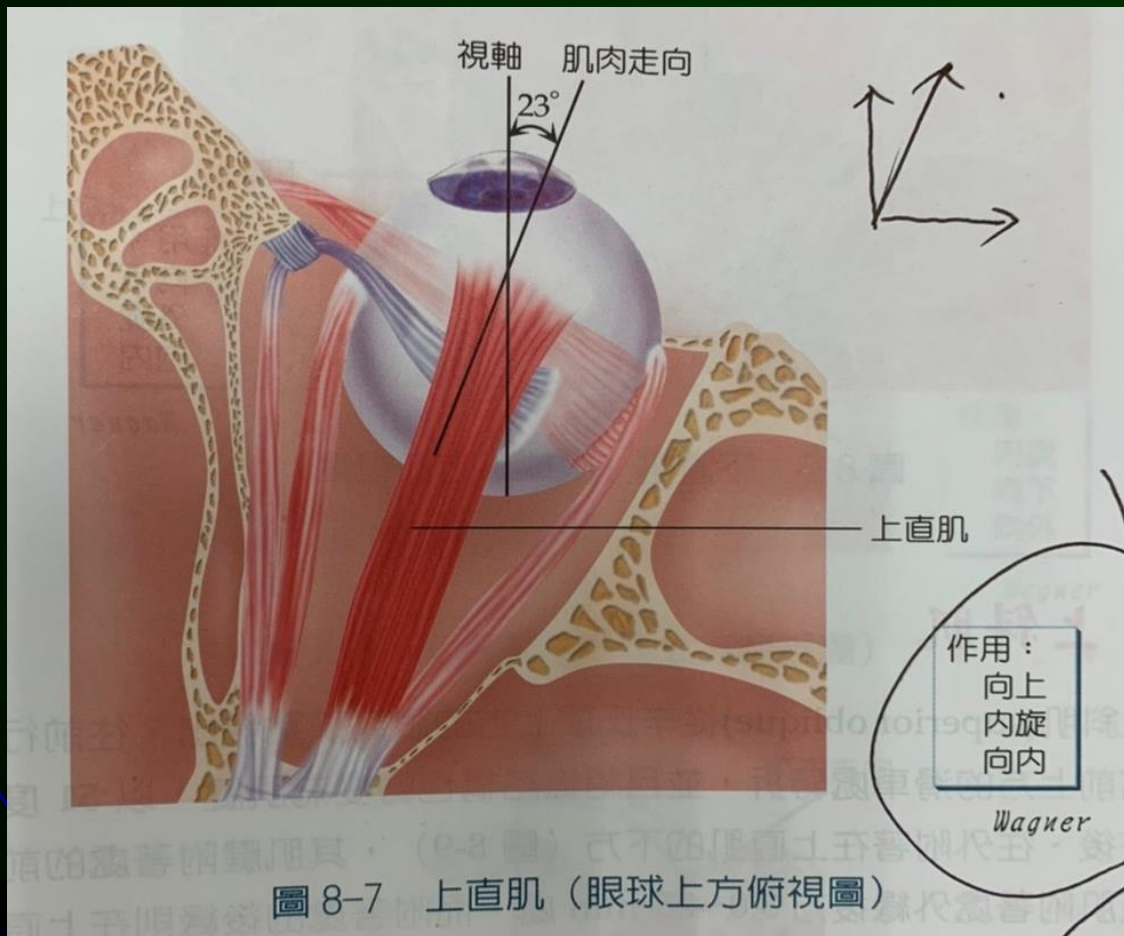
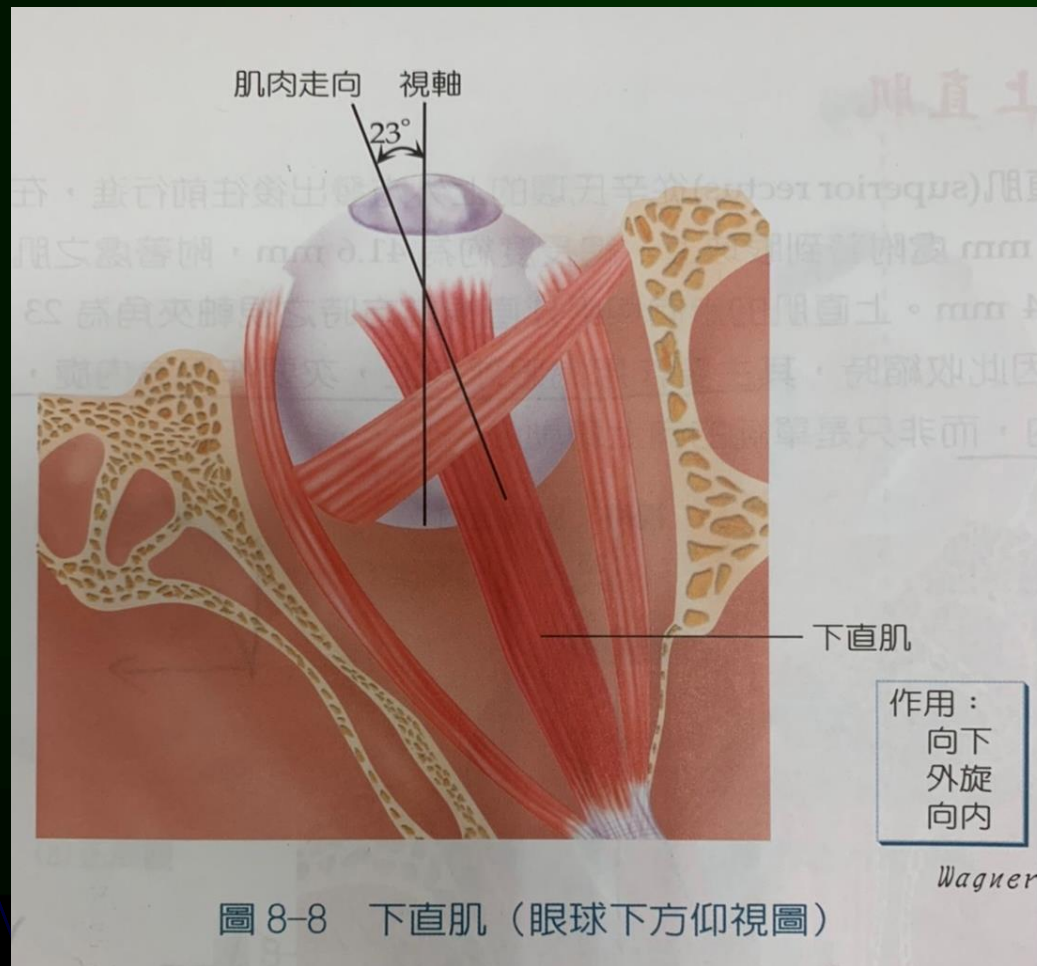


圖 8-7 上直肌 (眼球上方俯視圖)

下直肌(IR, Inferior Rectus)

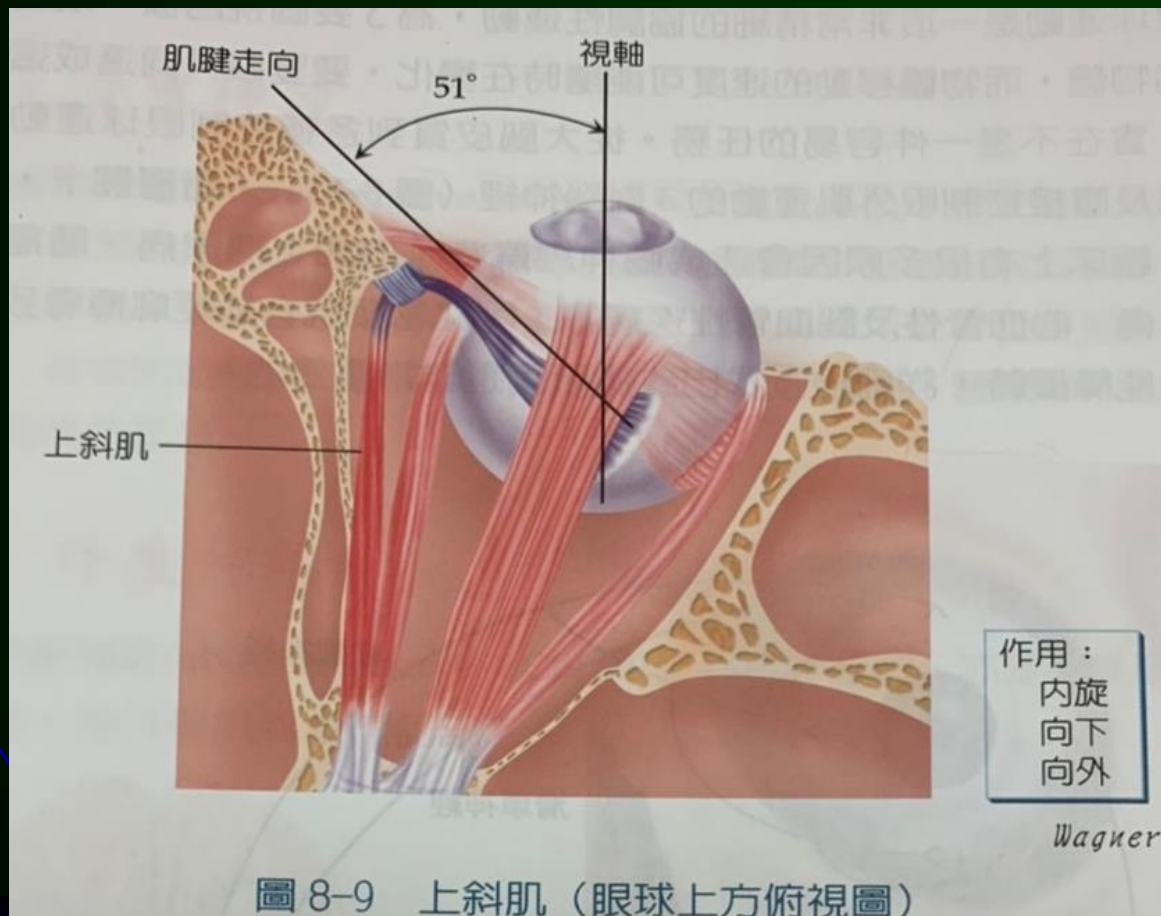
Insertion: 下、外、前

下、內、外旋



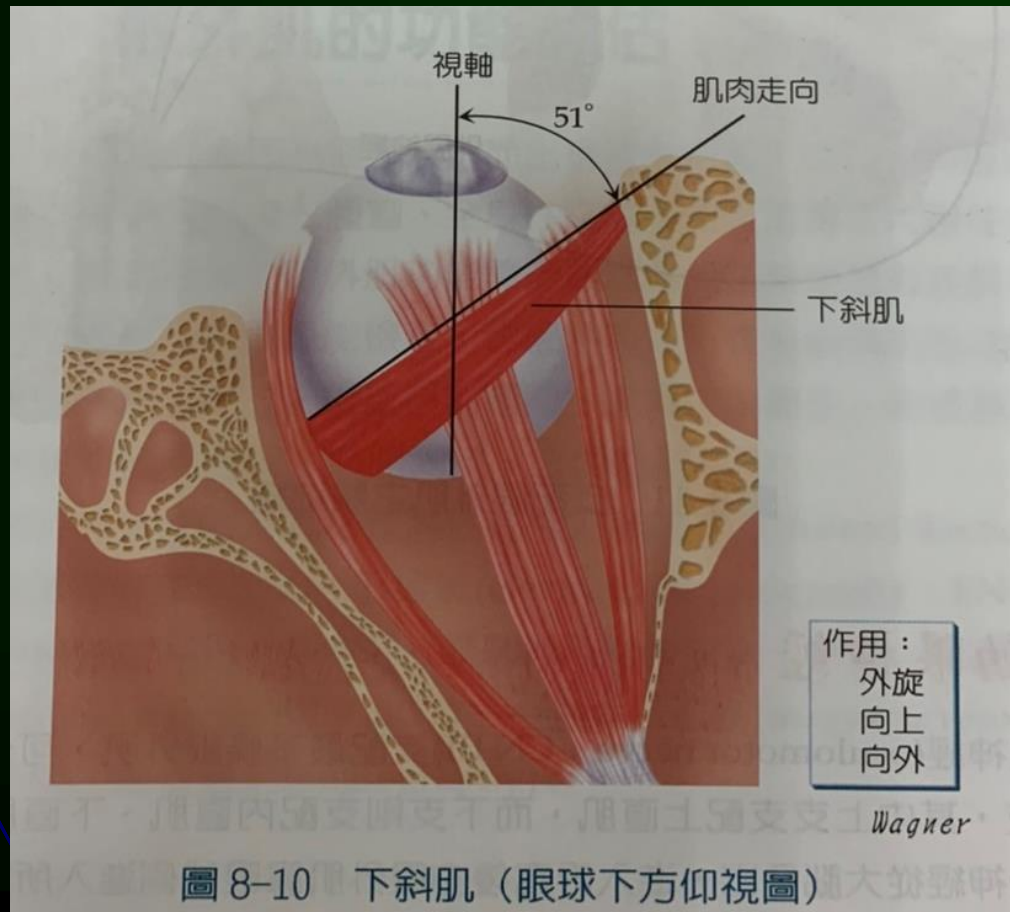
上斜肌(SO, Superior Oblique)

Insertion: 上、外、後
下、外、內旋

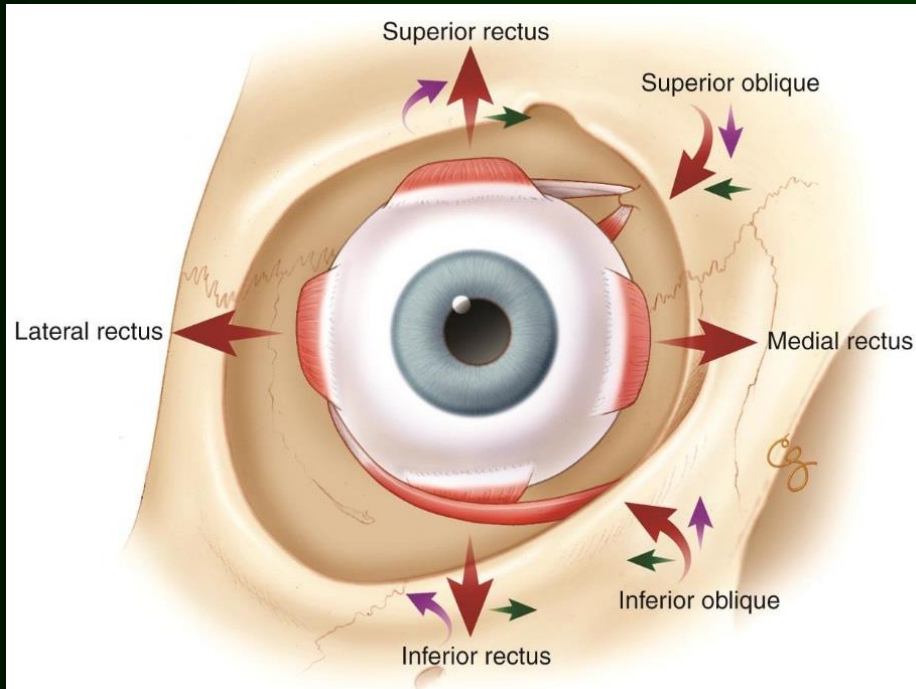


下斜肌(IO, Inferior Oblique)

Insertion: 下、外、後
上、外、外旋

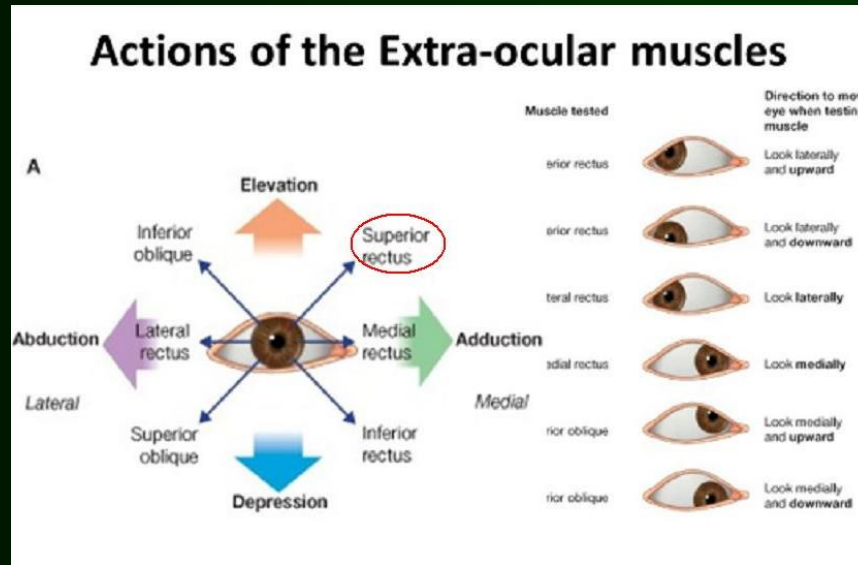


單眼六條眼外肌的作用 (1°主作用, 2°次作用, 3°小作用)



Muscle	Primary	Secondary	Tertiary
Medial rectus	Adduction		
Lateral rectus	Abduction		
Inferior rectus	Depression	Excyclotorsion	Adduction
Superior rectus	Elevation	Incyclotorsion	Adduction
Inferior oblique	Excyclotorsion	Elevation	Abduction
Superior oblique	Incyclotorsion	Depression	Abduction

眼外肌的主作用方向



IO

LR

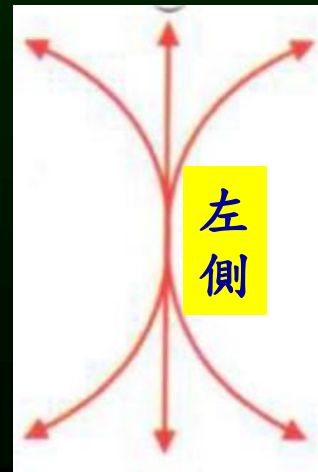
SO



SR

MR

IR



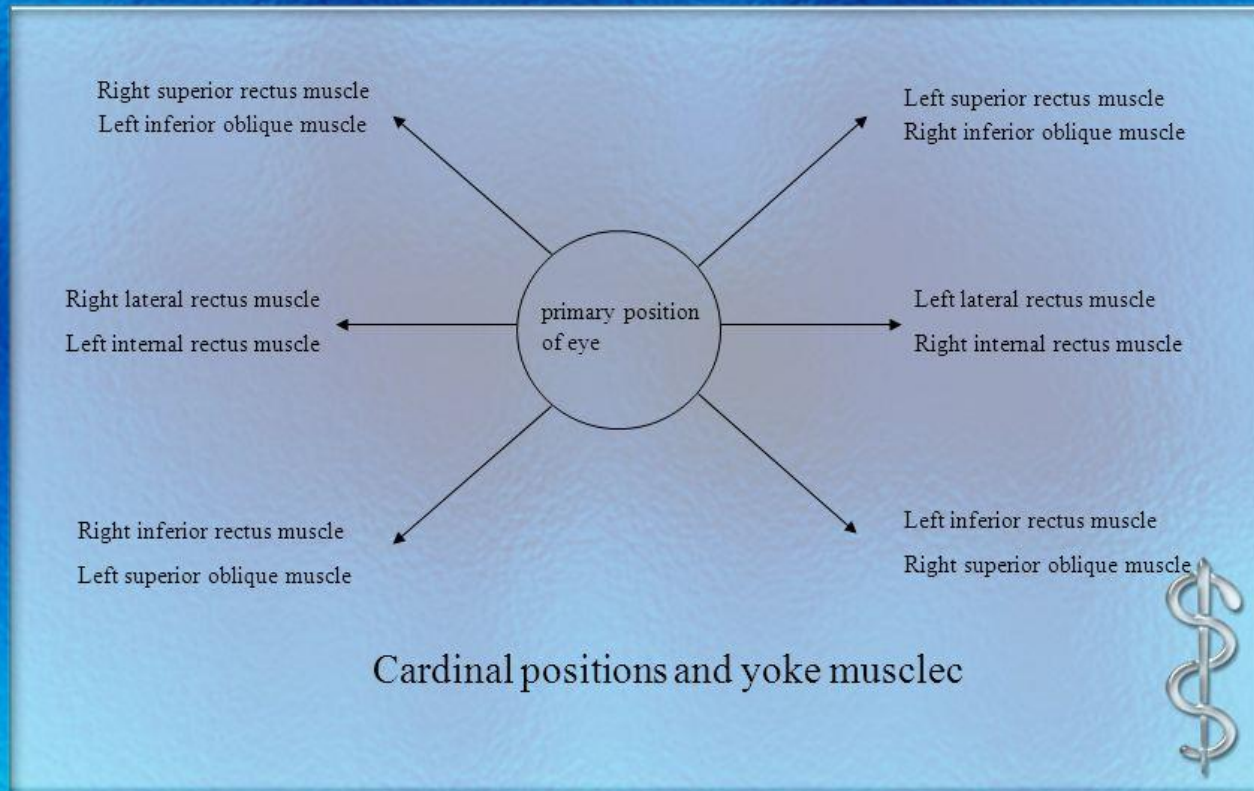
IO

LR

SO

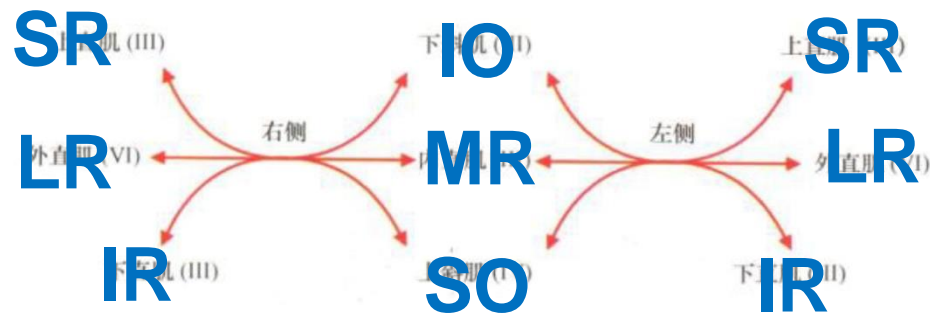
雙眼眼外肌同向的肌肉: Yoke muscles

Yoke muscles



雙眼眼外肌同向運動

SR：上直肌 IR：下直肌 MR：內直肌 LR：外直肌 S
O：上斜肌 IO：下斜肌



右上注視



左上注視



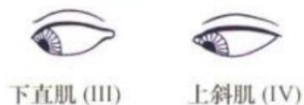
右方注視



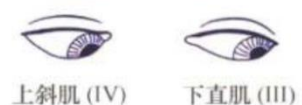
左方注視



右下注視



左下注視



半規管和眼外肌

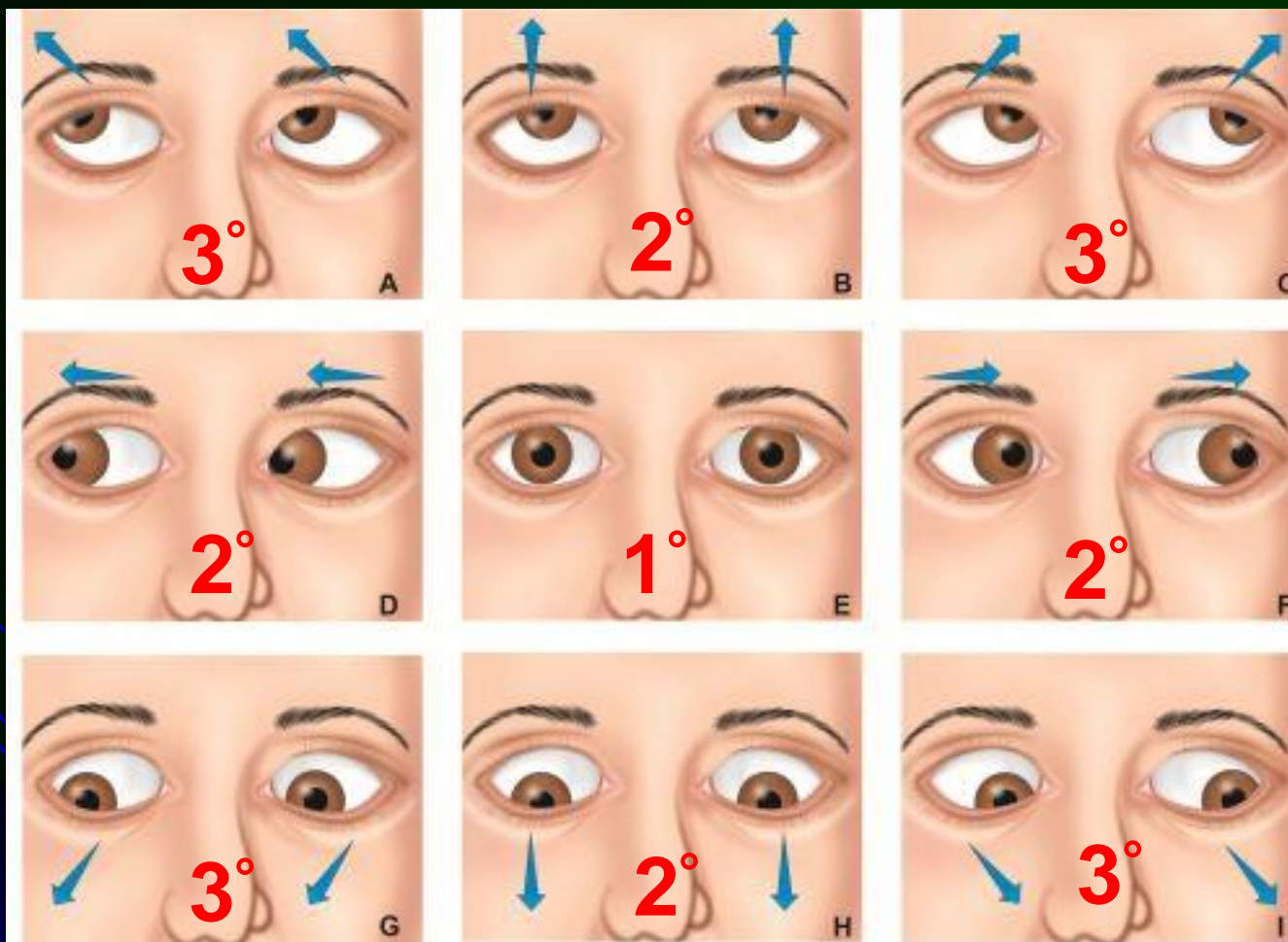
半規管	興奮	抑制
水平半規管	同側內直肌 對側外直肌	同側外直肌 對側內直肌
前垂直半規管	同側上直肌 對側下斜肌	同側下直肌 對側上斜肌
後垂直半規管	同側上斜肌 對側下直肌	同側下斜肌 對側上直肌

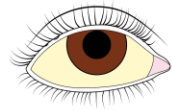
雙眼眼位檢查

1° position
(正位)

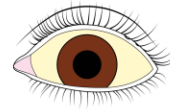
2° position
(上下左右)

3° position
(斜位)



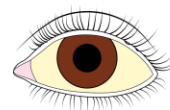
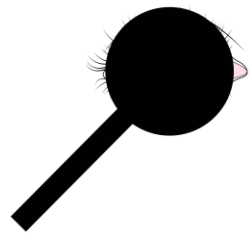


Hypertropic



Hypotropic

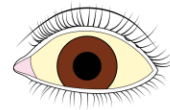
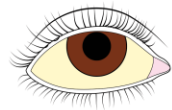
Skew deviation of pupils



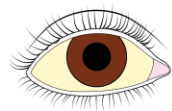
Refixated



Cover right and
Left eye moves up



Skew deviation of pupils



Refixated

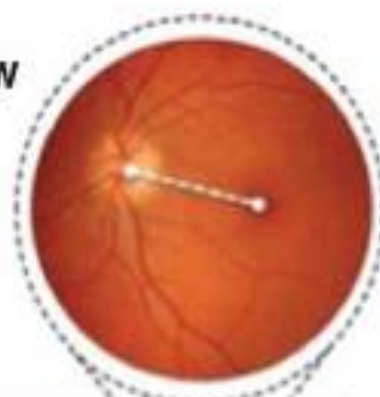
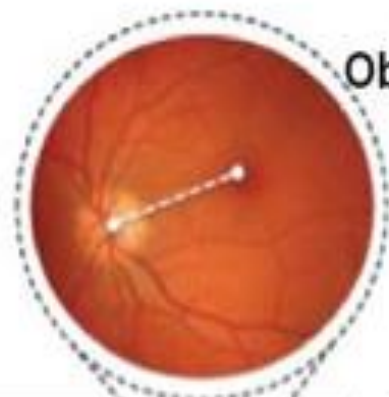


Cover left and
Right eye moves down

SKEW (OTR, ocular tilt reaction)

IV (SUPERIOR OBLIQUE PALSY)

A and B
Observer View



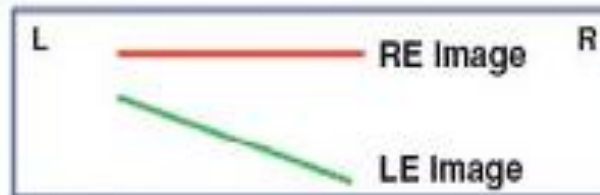
SKEW

SUPERIOR OBLIQUE PALSY

Higher eye intorted, lower eye extorted
Usually no or little torsional diplopia

Higher eye extorted
Torsional diplopia (images point to paretic eye)
Slant (top of object appears closer)

C and D (Patient View)

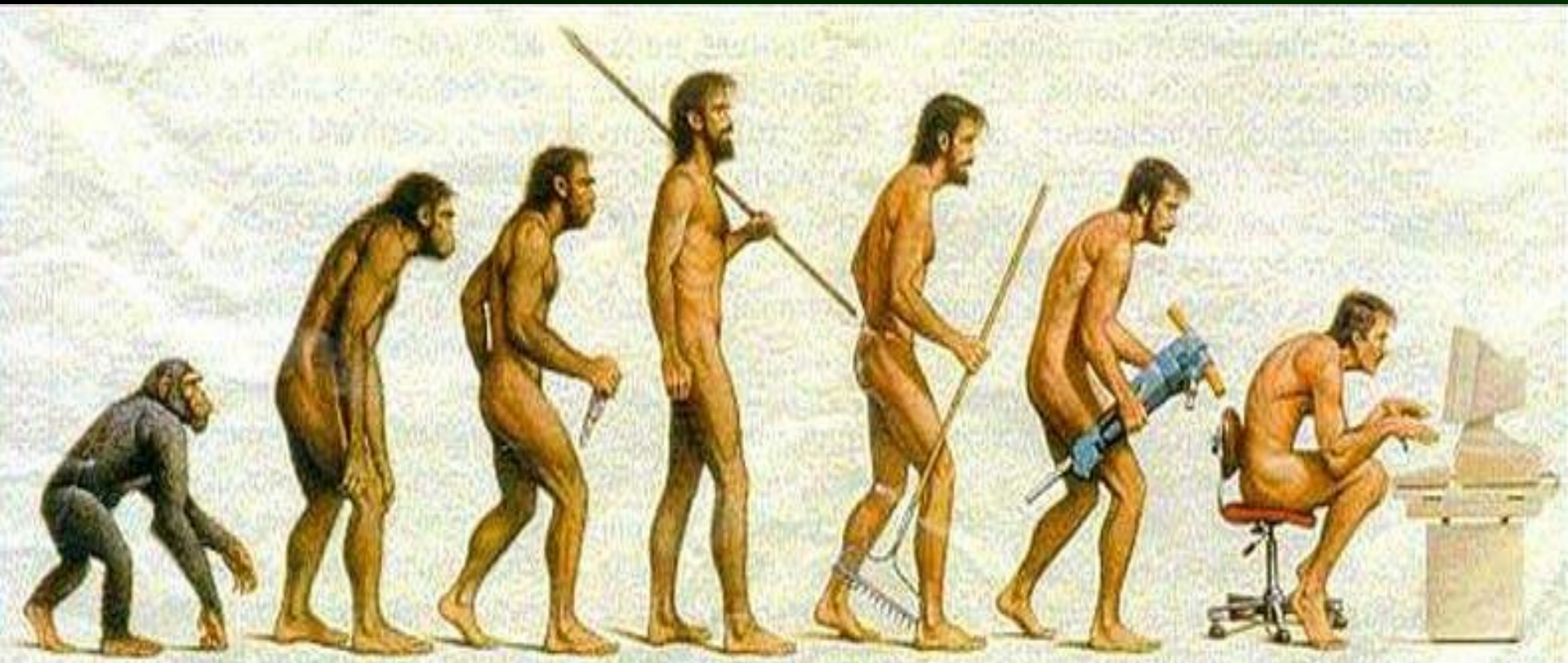


HINTS for DD Ac. Vestibular syndrome from stroke

1. Head Impulse test
(VOR: Vestibulo-Ocular Reflex)
2. Nystagmus Alexander's Law
3. Skew deviation 偏斜歪離

Side effect of Civilization 文明後遺症

Evolution VS Degeneration
進化 VS 退化



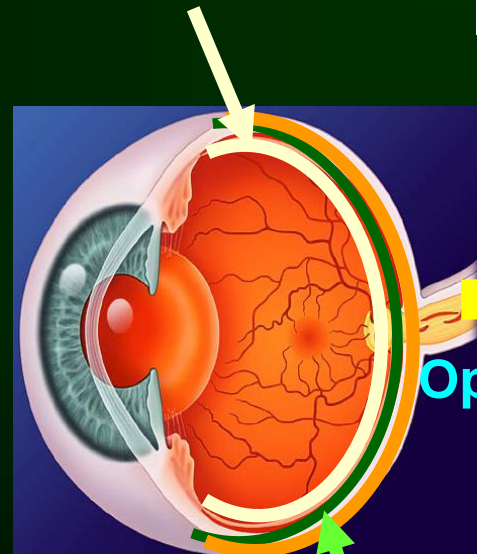
Simulator Sickness

C. Brain: Confusion
(Fusional dysfunction)

B. Both Eye:
Conflict
(Macula v.s Paramacula)
Mismatch
(Accommodation v.s
Convergence)

A. Single Eye: Tension
(Focus, Blue Light)

Retina
(Brain Nerve System)



Ophthalmic artery

Optic Nerve

Auricular nerve

BRB(RPE)

Choroid
(Cardiovascular System)



The Only Organ in the Body Could Precisely Say

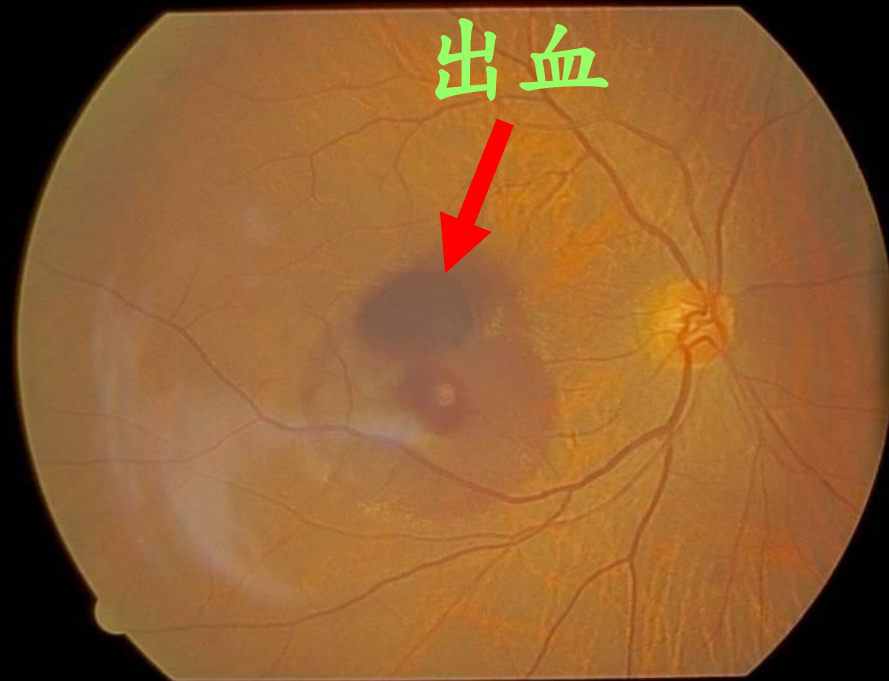


I (Eye) am Sick
Macula Speaks

Self-Test Sensitivity > 500X medical Test

正常黃斑部

自發性黃斑部病變



16-01-2003 12:15

黃斑部病變就是重點看不到

The image shows a person reading a newspaper with several articles and photos. The main headline at the top is '黃斑部病變就是重點看不到' (Macular degeneration is the key point you can't see). The newspaper content includes:

- 23億打造門面 瓏頂「迎光明」**: An article about a large-scale construction project, mentioning a 23-billion investment and the 'Lóngtǐng' project.
- 哈**: A large photo of a woman in a white dress, possibly a social event or wedding.
- 高62米 附歌劇院**: An article about a tall building with an opera house, mentioning a 62-meter height.
- 瘋者繼精晶片 5年內可握匙**: A headline about a psychiatric treatment or technology, mentioning '5 years' and 'holding a key'.
- 手製大足球**: An article about a hand-made football, featuring a photo of a large crowd.
- 英國皇室新一代比一比**: An article comparing the new generation of the British royal family, with photos of Prince William and Prince Harry.
- 門盤牛 撞斷角**: A headline about a bull, mentioning a door and a broken horn.
- 失獵食能力恐餓死**: An article about a bird, mentioning a loss of feeding ability and the risk of starvation.
- 最大行李箱**: An article about a large suitcase, mentioning a record-breaking size.
- 比兒女成績 英皇室也瘋狂**: An article about the British royal family's children's academic performance.
- 「沒小孩像他們一樣好」**: A quote or headline about children's behavior.

Call for Help

1. Is Nystagmus Reversible
2. Motion Sickness from 3C

CHINA MEDICAL UNIVERSITY HOSPITAL HSINCHU, TAIWAN

中國醫藥大學新竹附設醫院

感謝聆聽

Thank you !

