



Strabismus and Amblyopia

เกณฑ์มาตรฐานแพทยสภา 2555 ข้อ 2.3.7.1 เรื่อง

Disorders of ocular muscles (strabismus, amblyopia)

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Resource (Flipped Classroom) (COVID-19 era year 4)

Objectives

- สามารถวัด VA ในเด็กวัยต่าง ๆ ได้ถูกต้อง
- รู้และเข้าใจกายวิภาค และสรีรวิทยาของกล้ามเนื้อตา (prerequisite)
- ทราบนิยาม และลักษณะของตาเขชนิดต่าง ๆ
- สามารถตรวจตาเขได้ด้วยวิธี Hirschberg test, cover test
- สามารถแนะนำผู้ป่วย ผู้ปกครอง และส่งต่อผู้ป่วยตาเขในเวลาที่เหมาะสม
- บรรยายภาวะ amblyopia ชนิดต่าง ๆ ได้ถูกต้อง

Contents

- Tests for VA
- Strabismus
- Amblyopia

Tests for VA

- Fixation target test :
 - fix and follow
- Allen card
- LEA chart
- E-symbol
- Snellen chart



Fixation target test



OD fix and follow

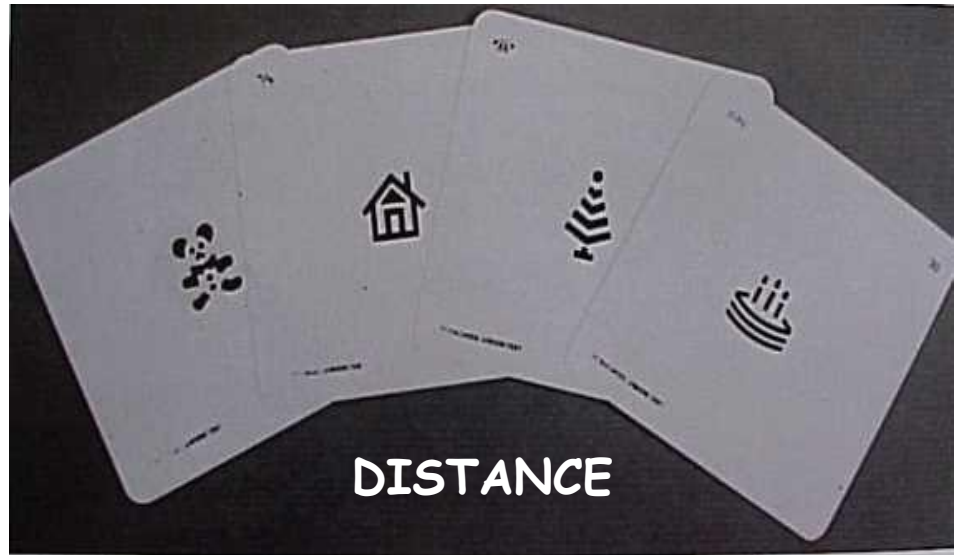
OS fix and follow



NEAR

Allen card

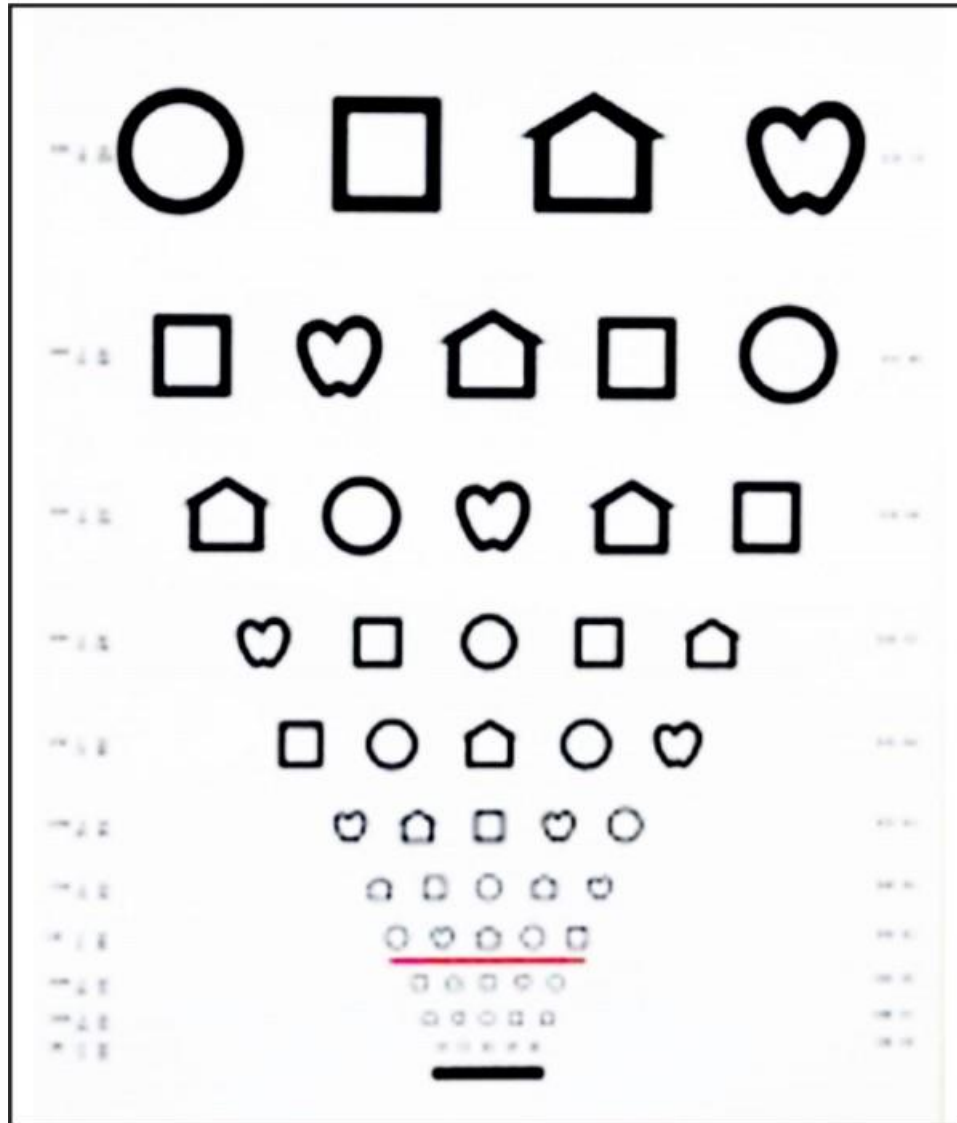
VA 20/30 is the best



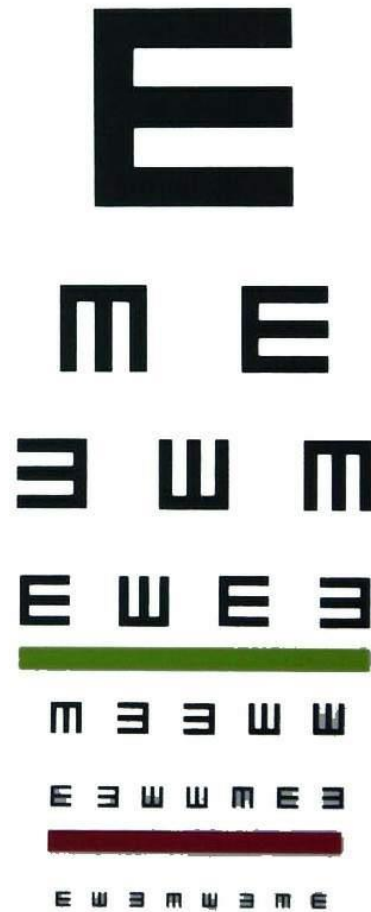
At 20 ft → VA 20/30

At 7 ft → VA 7/30

LEA chart



E-symbol



DISTANCE

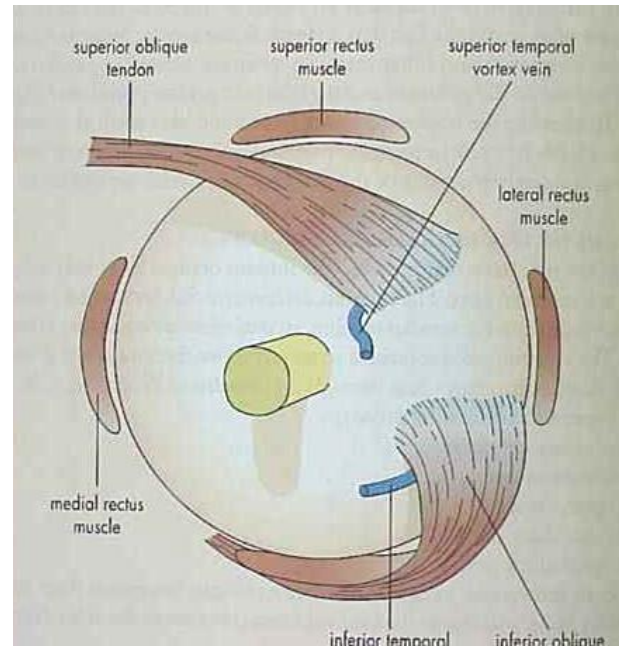
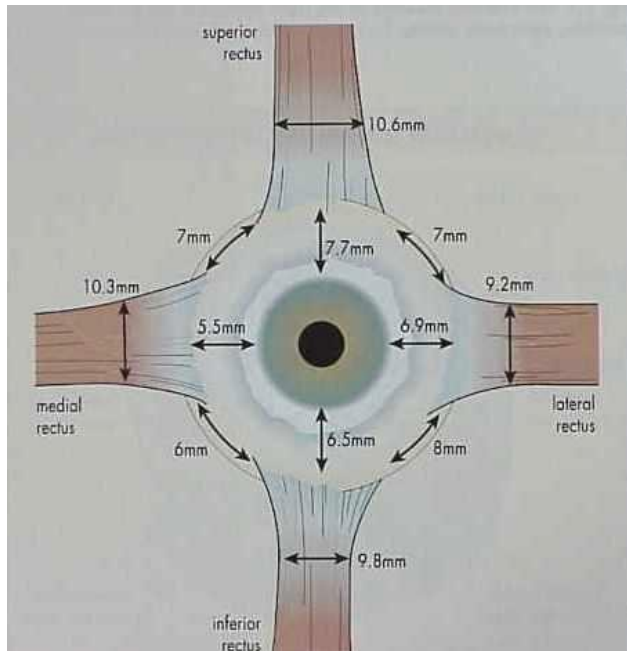
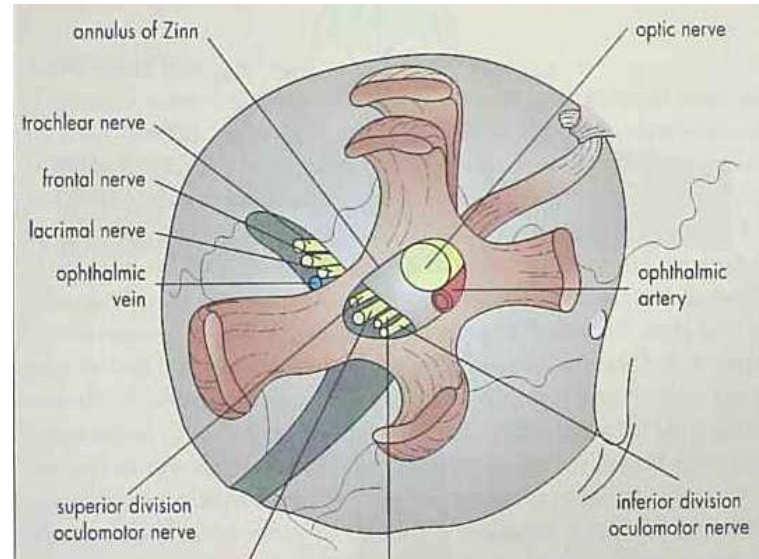
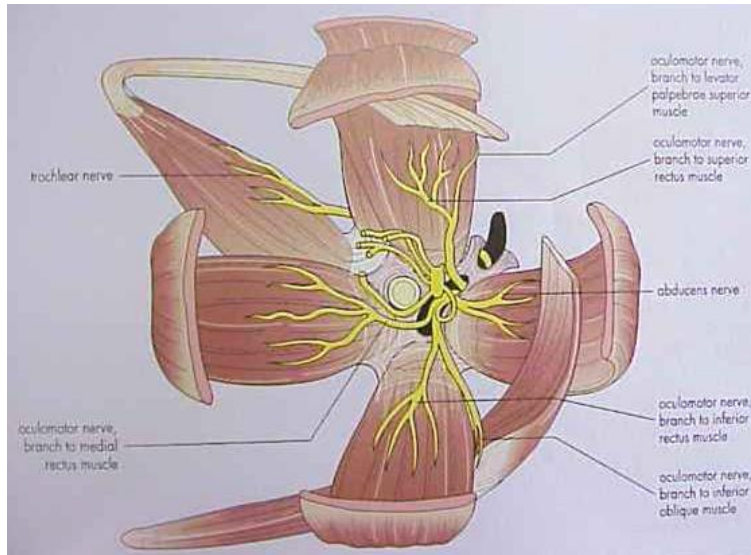
Terminology



- strabismus*
- squint*
- crossed eye (eso)
- walled eye (exo)
- lazy eye **?
- ตาเข
- ตาเหล่
- ตาเอ๊ก
- ตาส่อน
- ตาเล่อ
- ตาเซ่ ฯลฯ

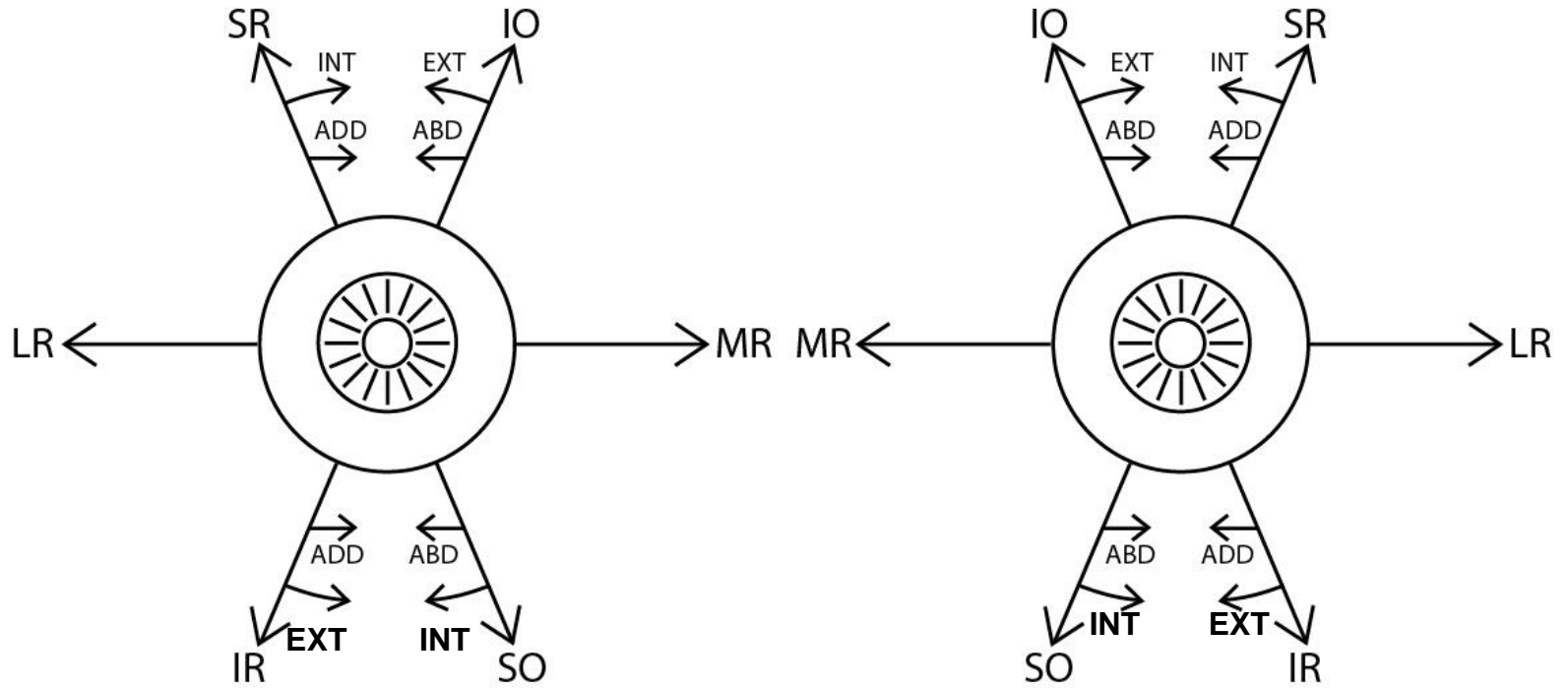


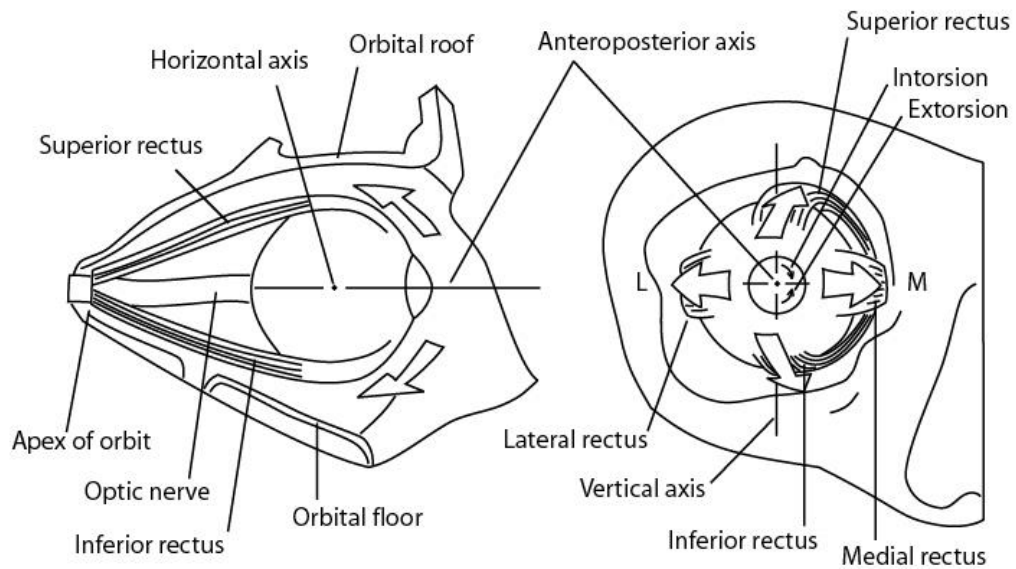
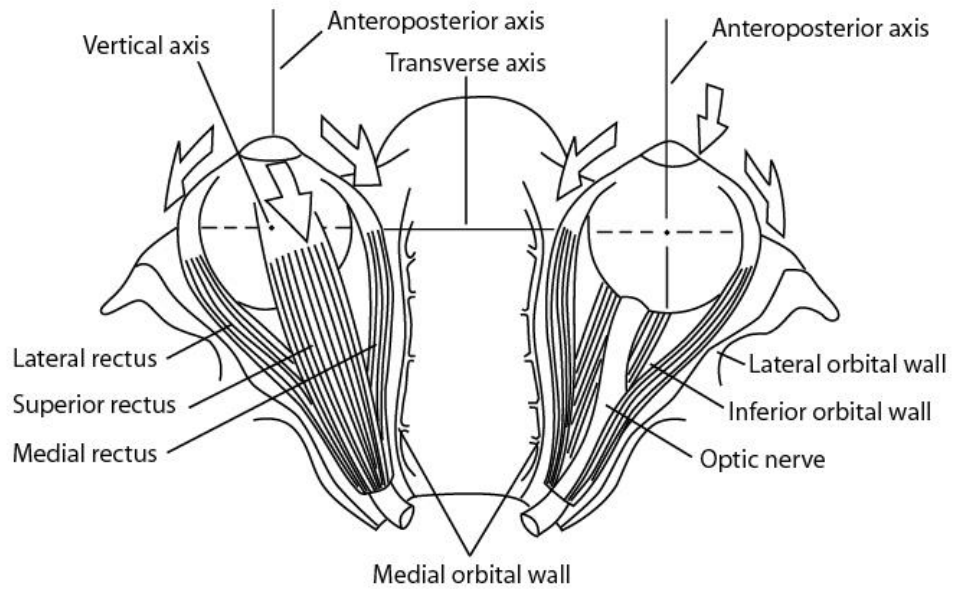
ตาเขหลอก pseudostrabismus
(pseudoesotropia) ข่าวฟัง 2562



RE

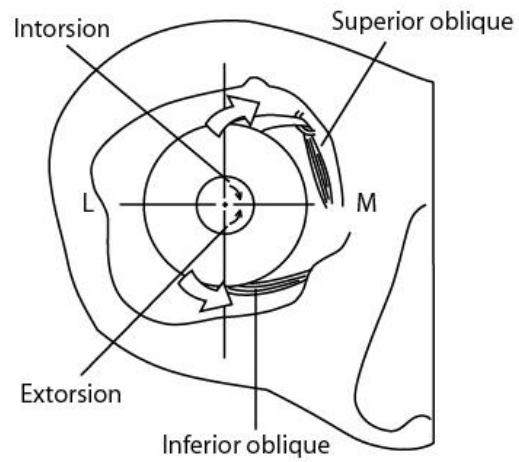
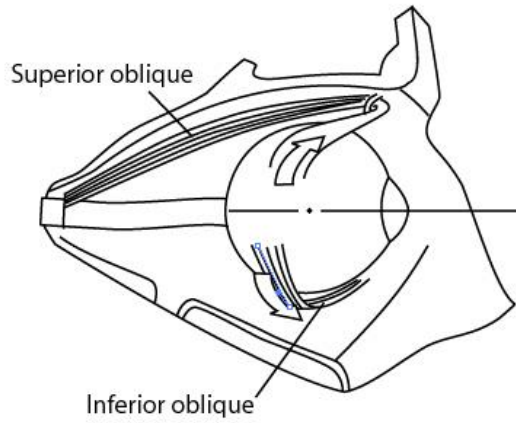
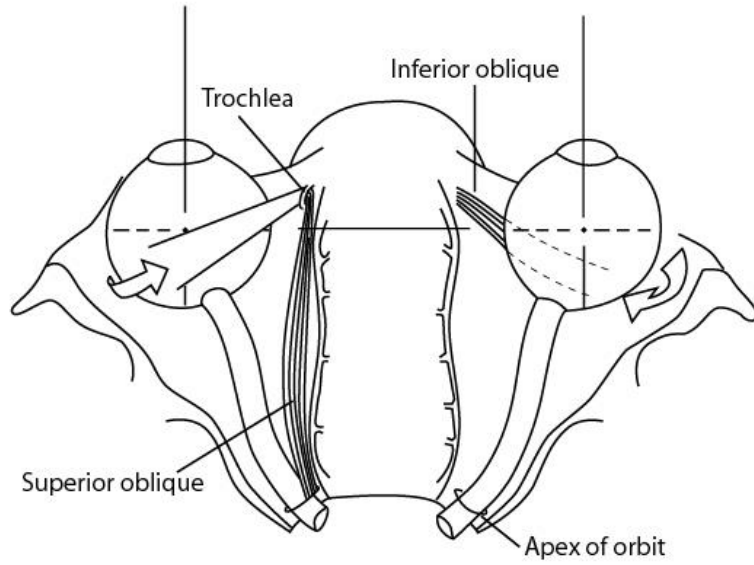
LE





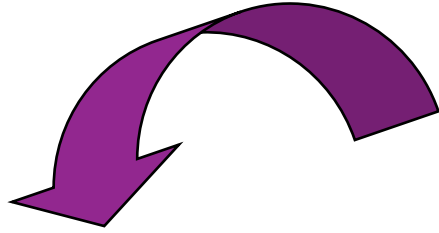
Reassure and follow 6-12 mo.



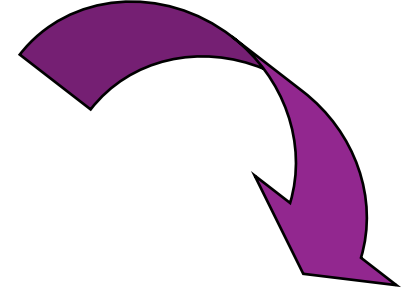


DUCTION

sursumduction

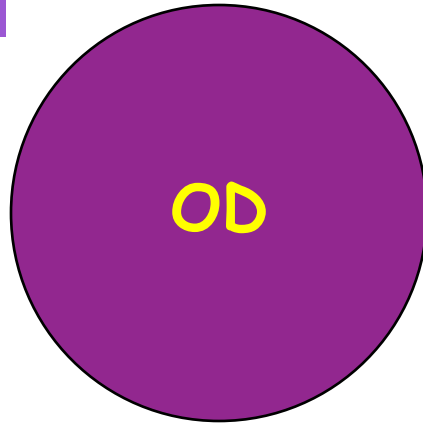


excycloduction



incycloduction

abduction



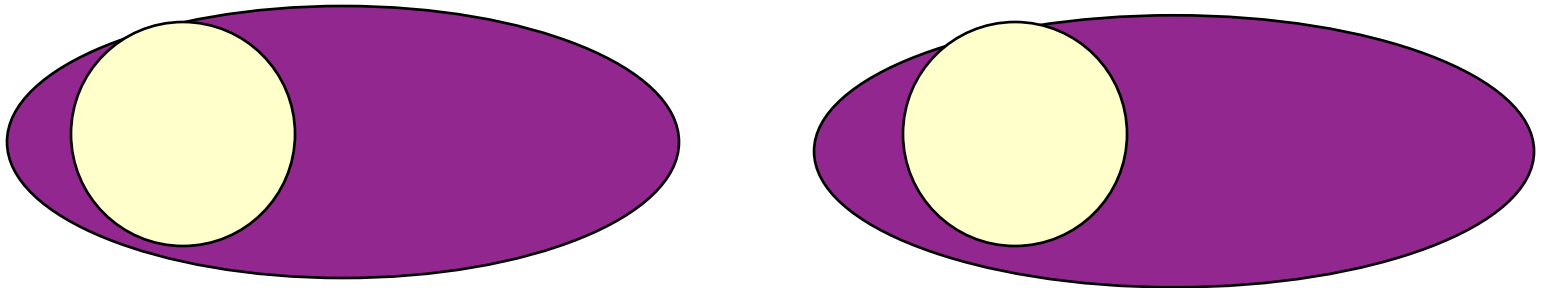
adduction



deorsumduction

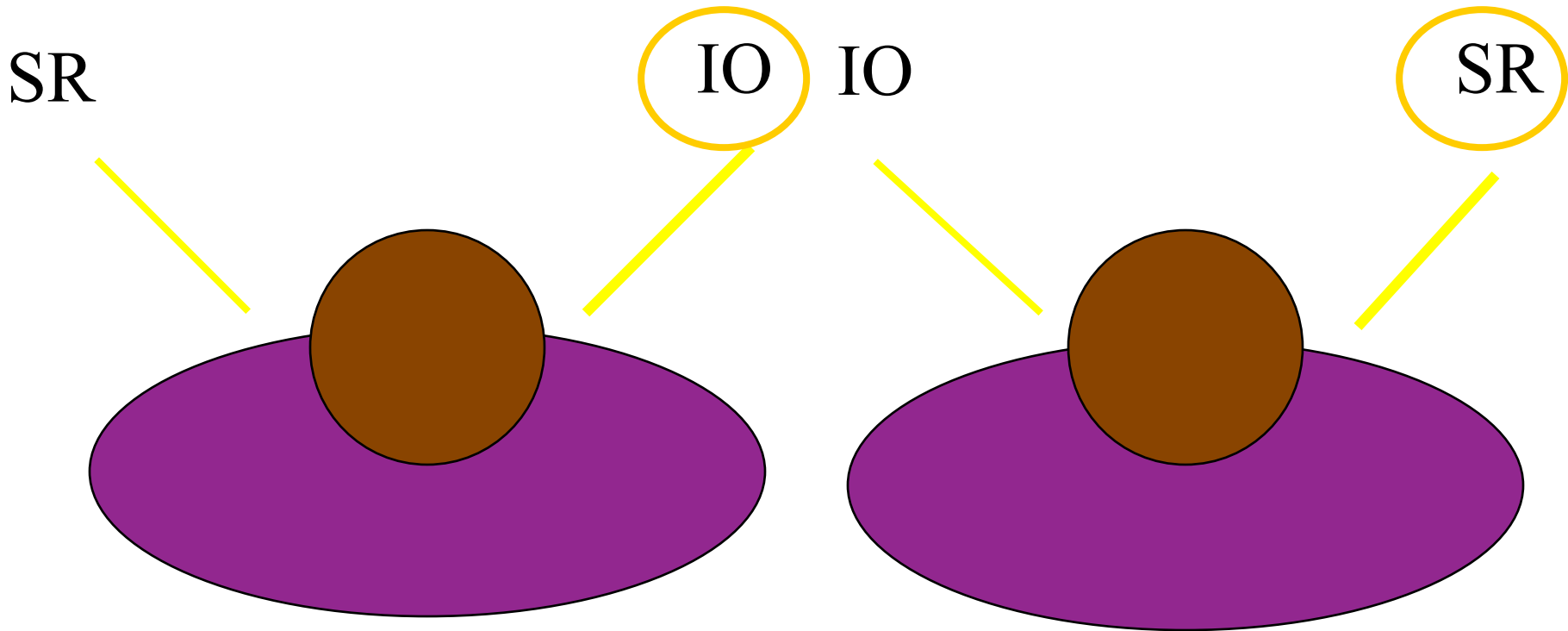
Version

- binocular eye movement
 - levoversion
 - dextroversion
 - sursumversion
 - deorsumversion
 - incycloverversion
 - excycloverversion



DEXTROVERSION

YOKE MUSCLES : RLR & LMR



OD

OS

YOKE MUSCLES

Strabismus classification

- *direction*: eso-, exo-, hyper-, hypo-
- *fusion ability* : heterophoria, heterotropia
- *age of onset* : congenital (infantile),
acquired-
- *comitancy*: comitant, incomitant
- etc...

Tests

- motor
- sensory

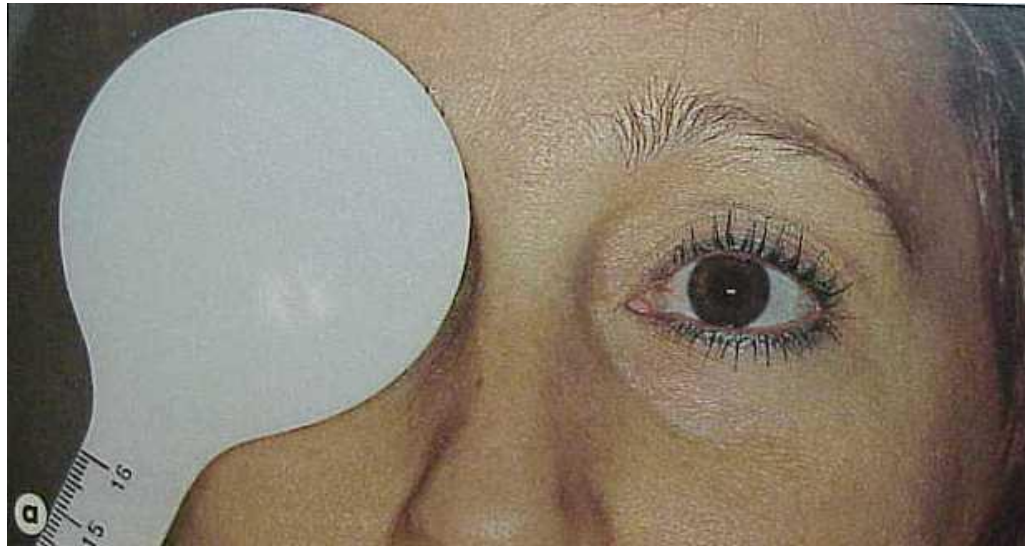
Cover test

cover-uncover :

detects (hetero)tropia

alternate cover test :

detects (hetero)phoria



OPD card

- Cover-uncover test:
 - Right/left eso/exotropia RET
 - Alternate eso/exotropia AXT
 - Orthotropia
- Alternate cover test
 - Esophoria E
 - Orthophoria



Hirschberg test

- Torch (penlight)
- Target
- Observe corneal light reflex OU



Hirschberg test

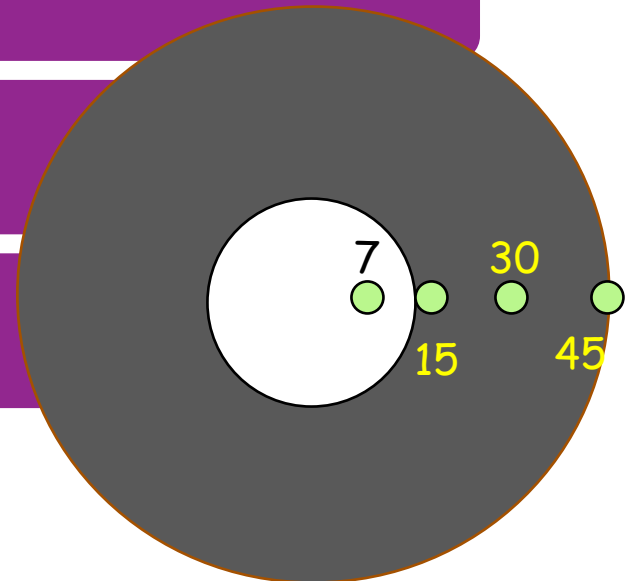
refer to pupil and limbus

between center and pupil margin : 7 deg

pupil margin : 15 deg

Mid-iris : 30 deg

limbus : 45 deg





Right hypotropia

Left hypertropia





Left sensory esotropia (LET)



RXT



Right hypertropia (RHT)



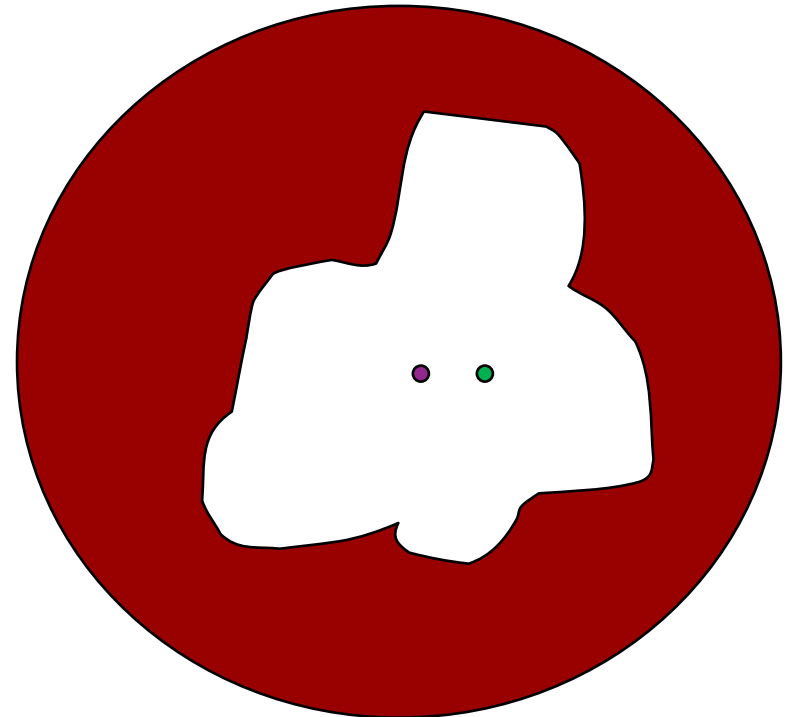
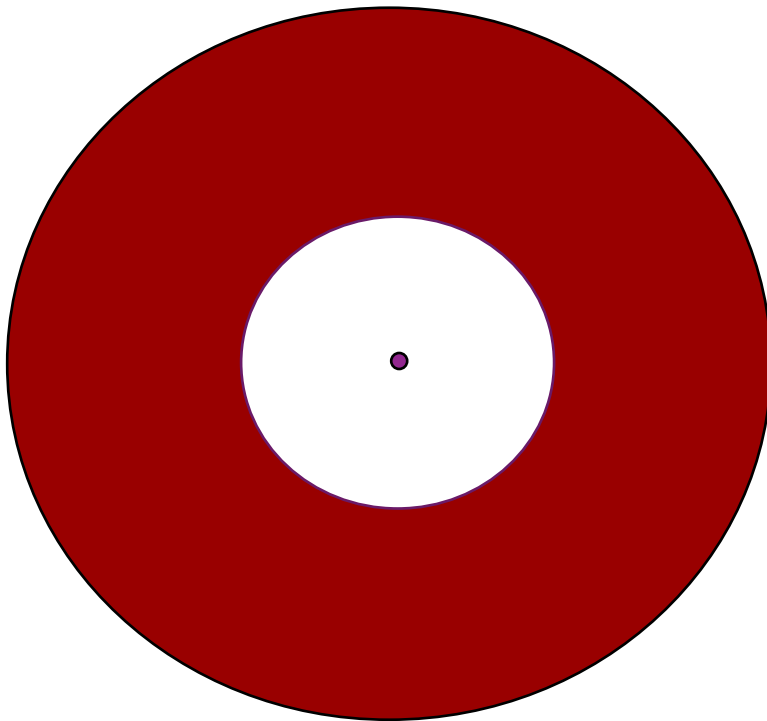
Right hypotropia (RHoT)

Hirschberg test

if pupil distorted, dilated, with posterior synechiae

decentration ? mm

1 mm ...7 degrees

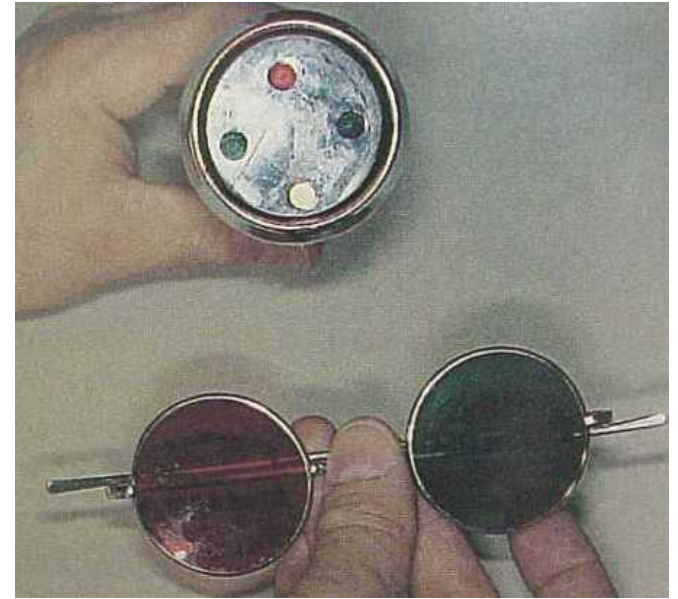


Alternate prism and cover test

- prism measurement of the deviation angle
- prism diopter (PD)
- 1 degree \sim 2 PD \triangle

Sensory test

- Worth-four dot test
 - fusion (see 4)
 - suppression of OS,OD or alternate suppression (see 2 or 3)
 - diplopia (see 5)



Sensory test

Titmus stereopsis test



Common strabismus conditions (SDL)

- Infantile esotropia
- Accommodative esotropia
- Intermittent exotropia
- Sensory strabismus
 - esotropia
 - exotropia

Common strabismus conditions (SDL)

- Paralytic strabismus
 - CN 3,4,6 palsies
- Restrictive strabismus
 - thyroid-related orbitopathy
 - blowout fracture

Infantile esotropia (SDL)

- onset before 6 months of age
- angle of deviation > 30 PD
- refractive error : normal with age
- amblyopia 40-50%
- treatment : surgery before 2 years of age

?





Occlusion therapy for right amblyopia
The earlier treatment, the better outcome

Accommodative esotropia (SDL)

- 2 types
 - refractive accommodative
 - high hyperopia
 - nonrefractive accommodative
 - high AC/A ratio
- treatment
 - hyperopic spectacle correction
 - bifocal spectacle correction



LET

(refractive accommodative ET)

(+6.00 diopters OU)



Orthotropia

(full hyperopic correction)

Nonrefractive accommodative ET; (high AC/A)



AT DISTANCE ตาตรง



AT NEAR เขเข้า



BIFOCAL SPECTACLE CORRECTION

Intermittent exotropia (SDL)



ORTHOTROPIA
ตาตรงคือไม่มี tropia



LEFT EXOTROPIA

Paralytic strabismus (SDL)

- CN6

 - esotropia

- CN4

 - hypertropia

- CN3

 - exotropia + hypotropia

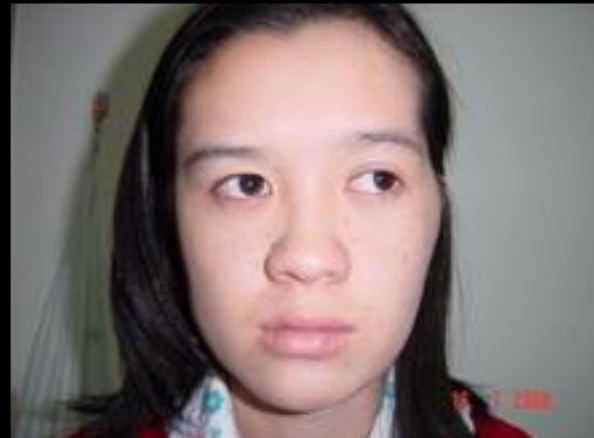
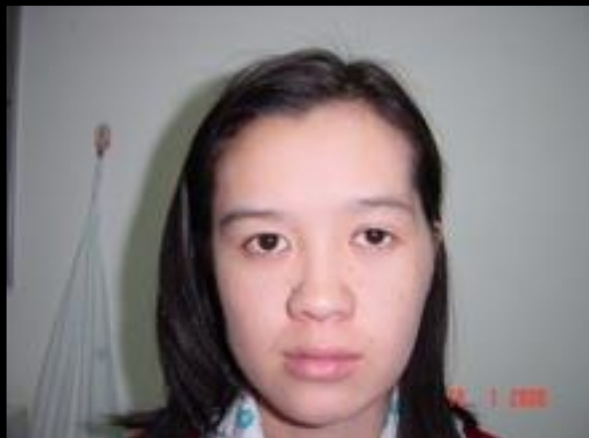
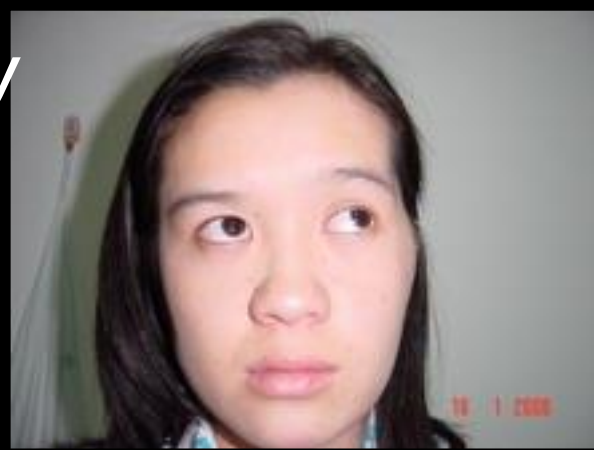
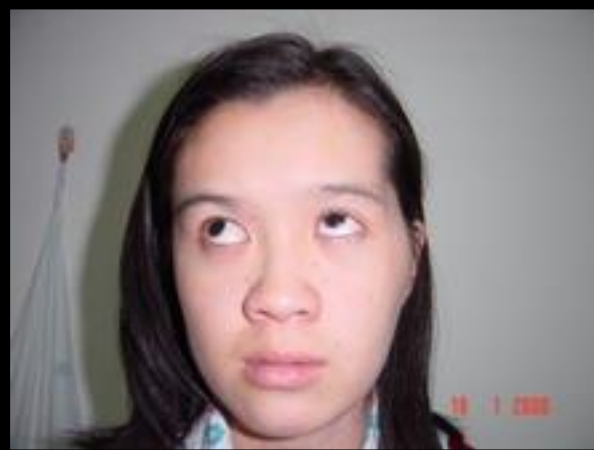


หาสาเหตุ

Third nerve palsy



Trochlear palsy



Abducens palsy



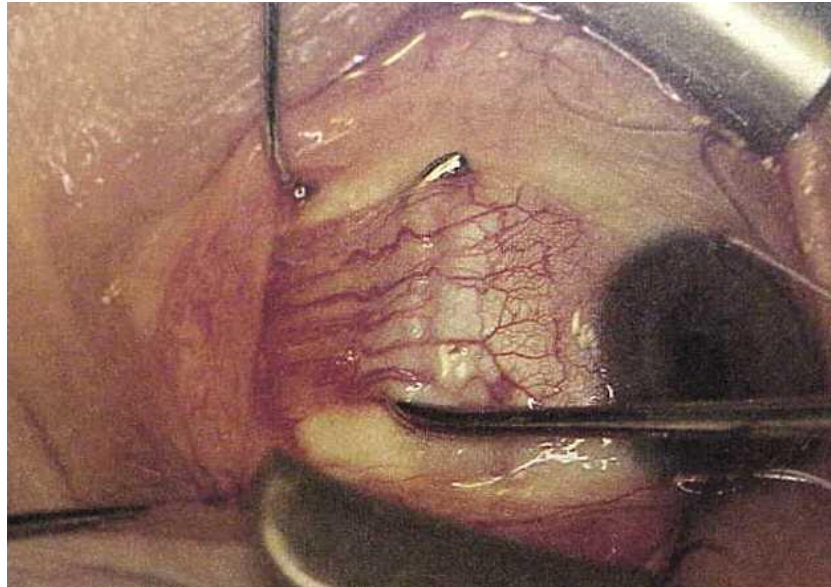
When to treat

- all children with strabismus
 - to prevent amblyopia
 - to improve single binocular vision
- strabismus in adults with symptoms

How to treat?

- Spectacles
- Patching (for kids with amblyopia)
- Surgery

Weakening -- *recession*



Strengthening -- resection



Botulinum (Botox) injection

Amblyopia

Features

- = **decreased vision** in an eye that otherwise typically appears normal
- usually unilateral
- may be bilateral (iatrogenic, uncorrected high bilat. refractive error)
- incidence : *2-4 %* (2-5%, Taylor) in general population
- The leading cause of monocular visual loss in 20-70 yo age group

Features

- never develop de novo after the age of *6-7 years*

(Tychsen,2002)

Features

- if previously amblyopic -- can return up to 10 years
- the younger at onset, the quicker and deeper it will develop
- the younger at onset, the more rapidly it can be reversed with treatment

Amblyopia (Lazy eye)

- Unilateral / bilateral
- Etiology
 - **Strabismus ****
 - High refractive error (iso-ametropia)
 - Anisometropia
 - Deprivation
- Treatment
 - Patch (the better eye)
 - Glasses
 - Correction of causes

VDO

