Classification of strabismus

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If the strabismus was present during the first 6-8 months of life, there is no potential for normal binocular vision.

Most prominent feature to have in mind = BINOCULAR VISION potential? Yes or No

This potential means that treatment (……) may restore binocularity, warranting stability and avoiding recurrences.

Binocular vision = eyes are like wheels on the rails of a railtrack.
What is BINOCULAR VISION?

1. Normal - Bifoveolar fixation with normal visual acuity in each eye, no strabismus, no diplopia, normal retinal correspondence, normal fusional vergence amplitudes, normal stereopsis.

2. Subnormal (abnormal) – 1 or more of the following; anomalous retinal correspondence, suppression, deficient to no stereopsis, amblyopia, decreased fusional vergence amplitudes.

3. Absence of Binocular Vision - no simultaneous perception, no fusion, no stereopsis

Besides, the classification of strabismus is based on a number of features including:

- The relative position of the eyes
- The time of onset (=clue for binocular vision potential),
- Whether the deviation is intermittent (=clue for binocular vision potential) or constant
- Whether the deviation is comitant (supranuclear cause) or incomitant (nuclear or infranuclear cause, clue for binocular vision potential if the eyes are straight in one position)
- According to the associated refractive error (accommodative strabismus)
### Most common types of strabismus in children

#### Supranuclear causes (generally comitant)

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#### Paralytic, muscular or orbital causes (generally incomitant)

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**Supranuclear causes**

- **Infantile esotropia**
- Accommodative esotropia
- Sensory esotropia
- Acquired late esotropia
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Esodeviation present before the age of 6-8 months, variably associated with other clinical features including dissociated vertical deviation, over-elevation in adduction, pseudoparesis of abduction, latent nystagmus, crossed fixation, asymmetrical monocular optokinetic responses (OKN) and, usually, no prominent refractive error.

**Paralytic, muscular or orbital causes**

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- Congenital cranial dysinnervation disorders (Brown, Duane, congenital fibrosis)
- Myopathies (myasthenia, chronic progressive ophthalmoplegia) (rare)
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Accommodative esotropia, or refractive esotropia, refers to eye crossing that is caused by the focusing efforts of the eyes as they try to see clearly (= around 2 to 3 y-o). Patients with refractive esotropia are typically hyperopic. Full optical correction of hyperopia may cure the esotropia totally (= **fully accommodative esotropia**) or partially (= **partially accommodative esotropia**).

Both conditions may be associated with innervational convergence excess, necessitating bifocals (= **accommodative non refractive esotropia**).

Severe optic disc anomaly on the RE, leading to very low vision and right esotropia.

Unilateral low vision from organic cause ⇒ squint (esotropia in children, exotropia in adults).
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- After 3-4 years of age, diplopia often present.
- Swann type: after a transient interruption of fusion (monocular occlusion for instance)
- Franceschetti type: no peculiar history, banal refraction, sometimes related to psychic trauma, severe illness, or neurological disease (posterior fossa tumor, hydrocephaly, Arnold-Chiari)

Chloé, 4 y-o, no previous strabismus, esotropia after 10 days of occlusion

Often after 2 years, less amblyogenic if intermittent.
Asymptomatic, or photophobia, closure of one eye, asthenopia, and reading difficulties.
Most prominent for far (near compensation by accommodative vergences), and when the child is tired or dreaming.
May become constant with loss of stereopsis.
Necessitates the use of +3 for near measurements (suppression of accommodative vergences) in order to distinguish divergence excess from convergence insufficiency and basic exodeviation (important for surgical plan)
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Pattern strabismus:
- Pattern A: >10D between up and down gaze
- Pattern V: >15D between up and down gaze, over-elevation and under-depression in adduction

Common Associated Findings:
- Small eso/exotropia angle (<8D horizontal and <4D vertical), in binocular condition, extramacular fusion and macular scotoma on the non-fixing eye (beautifully highlighted with the Gracie Biprism test)
- Common Associated Findings: can be primary, genetic or acquired after surgical treatment of infantile strabismus, can be associated with anisometropia, amblyopia often present, stereopsis present but poor, alternate cover test may reveal larger deviation than simultaneous cover test. Good fusional vergence amplitudes.
- General Comments: promotes stable ocular alignment and sensory status. Can deteriorate into constant, larger angle esotropia, requiring surgical treatment.

MONOFIXATION SYNDROME

Worse than normal binocular vision but much better than no binocular vision
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Congenital right superior oblique palsy: left head tilt, positive Bielschowsky test (right hypertropia) with head tilted on right shoulder.
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Myasthenia: before and after steroids

Bilateral IVth nerves palsy due to hydrocephaly

Left traumatic IIIrd paresis

Right traumatic Vth paresis
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Slanted mongoloid or antimongoloid orbits changes the direction of muscle vector forces, leading to pattern strabismus (V in antimongoloid, A in mongoloid orbits)

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Right floor fracture leading to restricted elevation
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