Eye movements produced by the action of single or combined extrinsic muscles of the right eye

OBLIQUE PULL OF SUPERIOR & INFERIOR RECTI

The orbit does not face directly forward but obliquely outwards. This results in the pull of the superior and inferior recti muscles being upwards/downwards but also INWARDS
The action of **Superior Oblique** is to pull its attachment to the globe upwards and medially. This will turn the cornea/eye downwards and outwards. Similarly the inferior oblique does the opposite, turning the cornea/eye upwards and outwards. The dotted line indicates the axis on which the eye “rotates” which is at right angles to the line of pull.

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- **UP/OUT** and **IN/OUT** movements are produced by **Superior rectus** and **Inferior oblique** muscles.
- **UP/IN** and **IN/IN** movements are produced by **Superior rectus** and **Medial rectus** muscles.
- **OUT** and **DOWN/OUT** movements are produced by **Lateral rectus** and **Superior oblique** muscles.
- **DOWN** and **DOWN/IN** movements are produced by **Inferior rectus** and **Inferior oblique** muscles.
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Superior rectus & inferior oblique

UP

UP/OUT
Inferior oblique

UP/IN
Superior rectus

OUT
Lateral rectus

IN
Medial rectus

DOWN/OUT
Superior oblique

DOWN
Inferior rectus & superior oblique

DOWN/IN
Inferior rectus

Superior rectus & inferior oblique

UP

UP/OUT
Inferior oblique

UP/IN
Superior rectus

OUT
Lateral rectus

IN
Medial rectus

DOWN/OUT
Superior oblique

DOWN
Inferior rectus & superior oblique

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We know that the isolated action of superior oblique is to turn the eye downwards & outwards. BUT lateral rectus & inferior rectus, acting together, could achieve the same action. By asking the patient to first look inwards (to negate the action of lateral rectus) & then downwards (inferior rectus is largely disabled when the eye is turned in) we test the isolated downward action of superior oblique.
Patient is looking to the left and both eyes are moving correctly.

Patient now looks to the right. Left eye moves correctly but right eye does not indicating a **right lateral rectus palsy** due to a defective right abducent nerve.

Patient is looking directly ahead. The right eye is normal. On the left there is a marked degree of ptosis, a dilated pupil and the gaze is downwards and outwards.

This indicates a **left third nerve lesion** with loss of parasympathetic to the pupil and loss of medial, superior & inferior recti & inferior oblique muscles.

The dominant muscles are now the lateral rectus (abducent n) and the superior oblique (trochlear n).