Rehabilitation Oculomotor Screening Evaluation (ROSE) INSTRUCTIONS

Equipment Needed: 30cm ruler with a small circular sticker at each end, metronome (app), stopwatch (app), eye cover (optional), pen light, a paper with a size 12, Calibri, "E" in the centre.

Smooth Pursuit

- Hold a small fixation target 40cm from the subject's nasion.
- Instruct them to look at the target and follow it while it moves.
- The subject should hold their head still. If unable to comply, stabilize their head for testing.
- Slowly (<40°/s) move the target to a span of 45° from midline (~40cm).
- Perform **2 cycles in all three directions** (there & back = 1 cycle). Look for deficits

Movement quality: *Small amplitude: ~2-5mm* *Large amplitude: >5mm*

Amplitude + jerkiness: *No jerkiness/ catch-up saccades OR less than 2 saccades*

Small amplitude OR 3-5 saccades *Large amplitude OR >5 saccades*

Asymmetry: *Symmetrical* *Minor* *Major*

- Count # of saccades, mark location of saccades during smooth pursuits on graph

Vergence

- Begin by holding a **30 cm ruler** on the subject's mid forehead (2cm above nasion).
- Slowly move the target toward the subject's nasion.
- Record the distance when the subject reports seeing double or when one of the eyes shift outwards (whichever occurs first) (**NPC**).

< 5.0cm of the nasion *>5.0cm & <10cm of the nasion* *>10cm of the nasion*

- Slowly move back out and record the distance (cm) when subject reports seeing the target clearly (I.e., no longer double) (**Recovery**).

< 7.0cm of the nasion *>7.0 & <12 cm of the nasion* *>12 cm of the nasion*

- **Repeat 3x trials** **If unable to test (no double vision), remove test from final score. **Symptom Rating (Smooth Pursuit + Vergence)**

Saccades

- The subject will be looking back and forth between the 2 targets on the ruler that is **40cm away** (15cm for vergence).
- Instruct the subject to look at the back and forth in between the two target as fast as possible for **8 seconds** (using a timer).
- Count the number of cycles performed in each plane. # of Saccadic Cycles (there & back = 1 cycle): *>7* *4-7* *<4*

- Do not allow the subject to move their head.
- Look for signs of apraxia, hypometria, dysmetria, inaccuracy, ocular flutter, and overshoot.

Accuracy: *Accurate* *Mild under/overshoot* *Severe under/overshoot*
[Mild: Deviation easily corrected] *[Severe: Consistent missing of target.]*

Symmetry of mvts: *Symmetrical* *Mild asymmetry* *Severe asymmetry*
[Mild: Deviates yet synchronous] *[Severe: deviates without synchrony]*

Symptom Rating (Saccades)

Fixation in 8 Gaze Directions (Can be performed immediately after smooth pursuits)

- The subject is advised to focus on a stable target (examiner's finger) positioned at the 45°(~40cm) in each gaze direction (vertical, horizontal, & diagonally) for at least **4** seconds per direction.
- Ensure the subject's head is stabilized in a fixed position for testing.
- Observe for gaze consistency, instability, loss of fixation, and nystagmus.:
  - *Stable fixation in 8 gaze directions. No signs of gaze induced nystagmus or drift. Able to maintain fixation in end of range gaze position for < 4s.*
  - *Gaze induced nystagmus and/or drift observed in 1 direction.*
  - *Gaze induced nystagmus and/or drift observed in >1 directions or not end of range*

Eye Cover Test

- Ask the subject to keep looking at the examiner's nose.
- Cover one eye for **2s**.
- Note if there is any corrective shift (eye mvt) observed in the uncovered eye. Mvt:

remains on target (no correction) *outwards inwards* *upwards downwards*

Alternate Cover-Uncover Test

- Ask the subject to look at the examiner's nose.
- Cover one eye for at least **1s** before switching.
- Once an eye is occluded, examiner observes the eye that was previously covered.
- Note the direction of any movement made on the image below. Uncovered eye mvt:

remain on the target *mainly outwards inwards* *upwards downwards*

- Perform at least **4x/eye**.

Symptom Rating (Cover Tests + Gaze fixation)

VOR Cancellation (cVOR)

- Ask the subject to sit with their feet on the floor, with their arms extended & hands clasped (thumbs up).
- While maintaining focus on the thumb, the examiner will rotate the subject's body, as a whole, achieving a total of 80° rotation.
- Use a **metronome set at 50bpm** (1 beat/direction).
- **Complete 5 cycles** CVOR eye mvt: (corrective saccades)

Remain on the target *Mild (under/overshoot)* *Severe (under/overshoot)*

[Mild CS: Deviation easily corrected] *[Severe CS: Consistent missing of target]*

Vestibular ocular reflex (VOR)

- Ask the subject to fixate at a small target (Calibri, size 12, "E", at the centre of a cue card) placed on a table in front of them (20□ of neck flexion).
- Move the subject's head from side to side (i.e., **"no"**), and then up and down (i.e., "**yes"**) for **5 cycles**, while maintaining fixation.
- Provide the cue "**don't resist me**," if the subject is tensing the neck.
- Move the head at **120bpm** (1 beat/cycle), through a range of ±25-30°

VOR: Stable target *Blurry or jumping target* *Inability to see target (E)*

Symptom Rating (cVOR+VOR)

TOTAL: score (/48) + VAS (/50 = 1-X5 (includes Baseline))
Smooth Pursuits (/14), Saccades (/16), Cover Test + Gaze fixation (/12), VOR +cVOR (/6)
What is/are the most provocative

2024 ROSE STUDY - GENERAL SCORING SHEET
Glasses: N / Y:
Corrected visual acuity (x/20):
Double Vision: N / Y: Horizontal/Vertical
Eye Pathology:

Patient name:

Date & Time:

*Note: ☻ = reminder to fill out VAS for symptoms

1) Observations

All within normal limits ☐

Head tilt/turn	☐ Small (<10 degrees)	☐ Large (>10 degrees)
Head Tremor	☐ Small	☐ Large
Slow light reflex (PERRLA), or asymmetry ☐	No light reflex (PERRLA) (L) ☐	(R) ☐
Mild ptosis/retraction/lid fasciculation	(L) ☐	(R) ☐
Severe ptosis/retraction/lid fasciculation	(L) ☐	(R) ☐

Additional Notes

Right Eye Left Eye



☻

Symptoms Rating in the last 24hrs:

Dizziness Nausea Headache

Fogginess Eye pain

Other:

2) Smooth Pursuits

		Horizontal	Vertical
Movement Quality *Small amplitude: ~2-5mm* *Large amplitude: >5mm*	No jerkiness/ catch-up saccades **OR** less than 2 saccades	0	0
	Small amplitude **OR** 3-5 saccades	1	1
	Large amplitude **OR** >5 saccades	2	2

		Horizontal	Vertical	Vergence
Symmetry of eye movements	Symmetrical	0	0	0
	Minor asymmetry	1	1	1
	Major asymmetry	2	2	2

Smooth Pursuits Total Score	**/10**
Excessive blinking of the eyes	(Y) ☐ (N) ☐

Notes:

*Mark the location of the saccade(s) during smooth pursuits (i.e., Horizontal, Vertical or Vergence)

2024 ROSE STUDY - GENERAL SCORING SHEET

Patient name:

Date & Time:

3) Vergence

Trial 1		Trial 2		Trial 3		Longest Distance	
NPC	Recovery	NPC	Recovery	NPC	Recovery	NPC	Recovery Δ
cm	cm	cm	cm	cm	cm	cm	cm

NPC Score *NPC= Near point od convergence	≤ 5.0cm of the nasion	0
	>5.0cm & <10cm of the nasion	1
	≥10cm of the nasion	2
Recovery Δ	≤ 7.0cm	0
	>7.0 & <12 cm	1
	≥12 cm	2
	Vergence Total Score	**/4**
	Excessive blinking of the eyes	(Y) ☐ (N) ☐

Notes:

4) Saccades

	# of saccades:	Horizontal #:	Vertical #:	Vergence
Number of Saccadic Cycles *(there & back = 1 cycle)*	>7	0	0	0
	4-7	1	1	1
	<4	2	2	2

		Horizontal	Vertical
Accuracy	Accurate	0	0
	Mild under/overshoot	1	1
	Severe under/overshoot	2	2

		Horizontal	Vertical	Vergence
Symmetry of mvts	Symmetrical	0	0	0
	Mild asymmetry	1	1	1
	Severe asymmetry	2	2	2

Saccades Total Score	**/16**
Excessive blinking of the eyes	(Y) ☐ (N) ☐

Notes:

Patient name:

Date & Time:

5) Gaze Fixation + Cover Tests

Fixation in 8 Gaze Directions

		L	R
Fixation	Stable fixation in 8 gaze directions. No signs of gaze induced nystagmus or drift. Able to maintain fixation in end of range gaze position for ≥ 4s.	0	0
	Gaze induced nystagmus and/or drift observed in 1 direction.	1	1
	Gaze induced nystagmus and/or drift observed in >1 directions or not end of range	2	2

Notes:

Neglect: (Y) □ (N) □



Eye Cover Test

		Left	Right
Eye Movement *Score the eye that is* ***uncovered***	Uncovered eye remains on target (i.e., no correction)	0	0
	Uncovered eye moves outwards inwards	1	1
	Uncovered eye moves upwards downwards	2	2

Alternate Cover-Uncover Test

		Left	Right
Direction of Deviation	Eyes remain on the target	0	0
	Uncovered eye moves **mainly** □ outwards □ inwards	1	1
	Uncovered eye moves □ upwards □ downwards	2	2
	Total Gaze Fixation + Cover Tests Score	**/12**	
	Excessive blinking of the eyes	(Y) □	(N) □

Notes:

2024 ROSE STUDY - GENERAL SCORING SHEET

Patient name:

Date & Time:

6) cVOR + VOR		
VOR Cancellation (cVOR)		
cVOR *Mild: Deviation easily corrected* *Severe: Consistent missing of target*	Eyes remain on the target	0
	Mild corrective saccades (under/overshoot)	1
	Severe corrective saccades (under/overshoot)	2

Vestibular-ocular reflex (VOR)			
VOR		Horizontal	Vertical
	Stable target	0	0
	Blurry or jumping target	1	1
	Inability to see target (E)	2	2
	Total VOR + cVOR Score	**/6**	
	Excessive blinking of the eyes	(Y) ☐	(N) ☐

Notes:



TOTAL

Test Item	Score	VAS 	What is/are the most provocative
Baseline		/10	
Smooth Pursuits	/14	/10	
Vergence	/4	/10	
Saccades	/16	/10	
Gaze Fixation + Cover Tests	/12	/10	
cVOR +VOR Score	/6	/10	
Excessive blinking of the eyes *No (Y) = 0 *≥ 1 (Y) = 1 *≥ 3 (Y) = 2	/2		
Total Score	**/50**	**/60**	
Total Score without Vergence *Calculate only if patient sees double	**/46**		