

Examination Algorithm for Trauma/Whiplash or Signs and or Symptoms Ascribable to VBI or Upper Cervical Instability

History & Observation

If Noncardinal Syx/Signs continue testing:

Blurred vision
Severe occipital pain/HA
Chronic HA
Facial hyper/hyp/anesthesia

If Cardinal Syx/Signs consult with MD

UMN:

Bilat/quadrilateral paraesthesia
Hemiparesthesia
Gait disturbance (e.g. ataxia)
Lost of sphinctor control

Deafness(esp.unilateral)
New onset of tinnitus
Dizziness or transient vertigo
Nausea
Vomiting
Dysphagia
Dysarthria
Hoarseness

UMN:
Dysphasia
Non-segmental anesthesia
Repeated unexplained falls
Feeling of being pushed to one side
Brainstem:
Ptosis
Facial weakness or asymmetry

Fainting
Clumsiness
Coldness
Heaviness
Causalgia (burning sensation of skin)

Vertical nystagmus
Periodic consciousness loss
Perioral pare/anesthesia
Horner's Syndrome

- If patient has positive cardinal syx/signs consult with MD
- If patient has positive non-cardinal syx/signs continue testing

Neurological Testing

• Cranial Nerve testing:

• I Olfactory:

Function: sense of smell

Positive symptoms: Paranosmia – hallucinatory smell (burned toast, feces)

Anosmia: loss of smell

Positive observations: none

I Olfactory cont.

Test: Eyes closed and one nostril covered.
Present smells (e.g. soap, coffee)

Positive Test Findings: Inability to smell

Cranial Nerve II Optic

Function: visual input from eye

Positive Symptoms: Visual disturbance (often cannot detect visual field loss since blind spot moves with eyes and/or head)

Positive Observations: None

Test: Confrontation Test: Patient and examiner face each other and focus on each other's eyes. For each eye (close together) present a finger or bright object

II Optic cont.

From the periphery of the right and left visual fields (top, bottom, side, and corners) equidistant from both parties

Positive test Findings: loss of visual field in one or both eyes

III Oculomotor, IV Trochlear, VI Abducens

Function: Somatic efferent – Motor control of extraocular muscles

Positive symptoms: visual disturbance, diplopia

Positive observations: strabismus, spontaneous nystagmus, ptosis, enophthalmos (retrusion of eyeball), exophthalmoses (protrusion of eyeball)

Oculomotor, Trochlear, Abducens cont.

Visual fixation test: patient eyes track therapist's finger which traces the letter H

Convergence test (exclusively for oculomotor): hold finger in the middle of the bi-ocular field & slowly move finger toward patient

Positive test Findings:

Visual fixation test: inability to track, nystagmus, inability to raise one/both eyelids

Oculomotor cont.

Positive Convergence test: inability of one eye to adduct

III Oculomotor: Visceral efferent: parasympathetic to ciliary & pupillary constrictor muscles

Function: photophobia (fear of light because the pupil cannot constrict)

Positive observations: pupillary abnormalities, asymmetrical pupil position

Oculomotor cont.

Test: Consensual reflex: cover ipsilateral eye while observing contralateral pupil. Continue observing contralateral pupil as ipsilateral eye is uncovered. Repeat with other eye.

Positive test Findings: as ipsilateral eye is covered, contralateral pupil does not dilate. As ipsilateral eye is uncovered, contralateral pupil does not constrict.

V Trigeminal

Function: Somatic afferent: sensation of face & scalp, conjunctiva (cornea), nasal, oral, lingual & paranasal sinus mucous membranes, teeth, external tympanic membrane, acoustic meatus and the meninges of the anterior and middle cranial fossae. Upper cervical proprioception via the spinal tract. General sensation from anterior 2/3 of tongue.

V Trigeminal cont.

Positive Symptoms: facial paresthesia or anesthesia (i.e. numbness), headache

Positive Observations: None

Test: Sensory testing of face and head: with toothpick check sensation bilaterally just off midline at the forehead, nose and chin.

Positive Test Findings: hypoesthesia or anesthesia, hyperesthesia is not relevant. It could indicate trigeminal neuralgia, which is very painful

VII Facial

Function: Brachial efferent: muscles of facial expression, stylohyoid, posterior digastric, stapedius and platysma muscles.

Visceral afferent: taste from anterior 2/3 of tongue (via chorda tympani)

Somatic afferent: small skin area around ear & much of the external tympanic membrane and acoustic meatus.

VII Facial cont.

Positive symptoms: hyperacusia (i.e. hypersensitivity to high frequency sounds), dysgeusia (i.e. taste disturbance)

Positive Observations: abnormal facial expression, mobility, and symmetry

Test: Facial strength test: assess lower facial muscles with smile, whistle, baring teeth, and puckering lips. Upper facial muscles can be assessed by closing eyes and wrinkling the forehead.

VII Facial cont.

Positive Test Findings: weakness of contralateral supraorbital and infraorbital facial muscles;

VIII Vestibulocochlear (Cochlear division)

Function: Special sensory: auditory (hearing)

Positive symptoms: disturbance in hearing, ringing or buzzing in ear (tinnitus)

Positive Observations: Cochlear tests: Finger rustling test: rub the thumb and index finger of each hand together and slowly move closer to the patient's ears.

VIII Vestibulocochlear (Cochlear division) cont.

The patient is instructed to tell the therapist when they can hear the sound in each ear.

Positive test Findings: hears rustling finger better in one ear than the other, with humming one ear hears better than the other.

VIII Vestibulocochlear (Vestibular Division)

Function: Special Sensory: vestibular (balance) input from inner ear

Positive Symptoms: dizziness, nausea, vomiting. These are most frequent complaints of brainstem lesions

Positive Observations: nystagmus

Test: patient sitting at edge of table. Support occiput and upper trunk with one hand and forehead with other to minimize cervical

VIII Vestibulocochlear (Vestibular division) cont.

spine movement. First with the patient's eyes opened move them side to side, forward and backward and in circles in both directions. If this does not induce a positive response, you can repeat with the eyes closed. The more severe or acute the problem, the less stimulus is required to provoke the symptom. Conversely more subtle presentations require more vigor.

VIII Vestibulocochlear (Vestibular division) cont.

Positive test Findings: complaint of dizziness, nystagmus

IX Glossopharyngeal

Function: Visceral efferent: parasympathetics to parotid gland.

Branchial efferent: stylopharyngeus m.

Visceral afferent: sensory input from carotid body and sinus; taste from posterior 1/3 of tongue

Somatic afferent: general sensation from post. 1/3 of tongue, soft palate, and auditory tube

IX Glossopharyngeal cont.

Positive symptoms: dysphagia (difficulty swallowing fluids and eating solid foods); dysarthria (less often); dysgeusia (i.e. taste disturbance)

Positive observations: None

Test: Gag reflex

Positive test Findings: gag reflex is not performed in the PT clinic.

X Vagal

Function: multiple functions

Positive Symptoms: Dysphonia – difficulty with clear speech due to compromise of the larynx; Dysphagia – difficulty swallowing fluids and eating solid foods

Positive Observations: None

Test: Phonation Test: request the patient opens their mouth wide and say “ahhh”, while observing the uvula. Typically, the

X Vagal cont.

tongue depress allowing viewing of the uvula. If it does not depress, the therapist can use a tongue depressor.

Positive Test Findings: in unilateral paralysis or paresis, the uvula and median raphe of the palate move toward the intact side and the posterior pharyngeal wall of the paralyzed side move like a curtain toward the intact side.

XI Spinal Accessory

Function: Branchial efferent: sternocleidomastoid & trapezius ms.

Positive Symptoms: shoulder weakness, could manifest as AH impingement

Positive Observations: in lower motor neuron injury the trapezius will atrophy. In upper motor neuron lesion, there will be minimal atrophy

XI Spinal accessory cont.

Test: MMT for upper trapezius with shoulder shrug

Positive test Findings: upper trapezius contraction can be broken

XII Hypoglossal

Function: Somatic efferent: all intrinsic & extrinsic tongue muscles and hyoid

Positive Symptoms: dysarthria (slurred speech); Atrophy, fasciculation's, or tremors of the tongue while protruding or lying at rest in the mouth

Test: request that the patient stick their tongue out

Positive test Findings: tongue deviates to the weak side; with LMN pathology, one may observe atrophy, fasciculation's or tremors

- If cardinal syx/signs are positive consult with MD
- If syx/signs negative continue testing

Active Movement Testing

- Test active cervical flexion, extension, and rotation
- Less than 10 degrees in multiple directions (i.e. flex, ext, rot), might indicate an instability or fracture, so consult with physician
- If Cardinal signs positive consult with MD
- If negative signs continue testing

Fracture Tests (only in cases of recent trauma or suspected fracture)

1. Observation: severe volitional guarding
2. Active movement: Less than 10 degrees in multiple directions (i.e. flex, ext, rot), might indicate an instability or fracture, so consult with physician

Severe multidirectional spasm

If bilateral or quadrilateral paresthesia during these motions, support neck while physician is contacted

3. Resisted testing: (If irritable, test supine with head and neck supported). Painful weakness in multiple directions not corresponding to a particular muscle group, might indicate a fracture.
4. Compression: (If irritable, test supine with head and neck supported). Pain and spasm may indicate a fracture especially if associated with painful weakness.

Indications for referral for radiograph.

1. Any one or combination of the above physical findings could trigger a request for radiographs, The more positive findings, the stronger the request.

If suspected fracture or positive cardinal syx/signs consult with MD

If negative continue testing

Craniovertebral ligament stress tests

- Alar ligament
- Transverse ligament

If suspected instability or positive cardinal syx/signs consult with MD

If negative continue testing

VBI Testing

Minimally required testing positions:

- a. Extension
- b. Rotation right and left
- c. Pre-intervention hold (if applicable)
- d. Comparable posture, position, or manner (if applicable)
- e. Add testing positions of rotation right and left combined with extension if necessary

If positive cardinal syx/signs consult with MD

If negative continue - Treat as appropriate