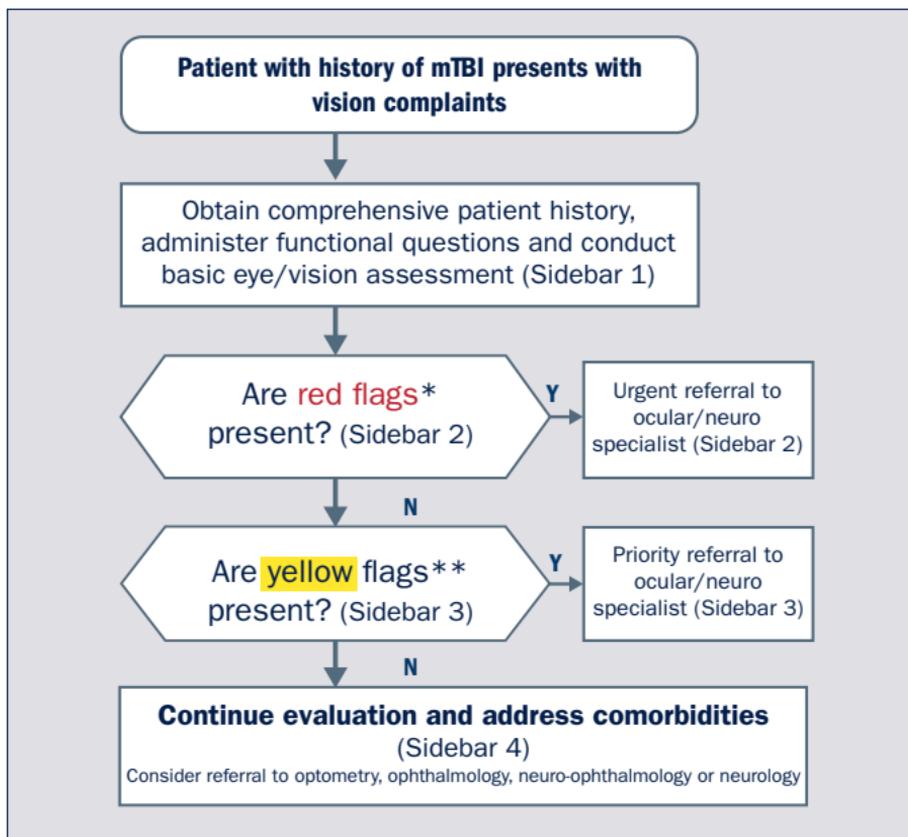


Assessment and Management of Visual Dysfunction Associated with Mild Traumatic Brain Injury

This algorithm is intended to assist primary care providers (PCP) with evaluating and providing appropriate referrals for patients presenting with suspected eye or vision problems following mild traumatic brain injury (mTBI). Included is a listing of red and yellow flags and specific comorbidities which should be explored based on the patient's symptomatology. The processes outlined in the algorithm should not replace sound clinical judgment or standard clinical practice when caring for a patient.



***Red Flags:** Signs and symptoms of potential ocular, cranial nerve or structural brain injury which may cause sight and/or life threatening outcomes, thus requiring urgent referral or consultation (see Sidebar 2)

****Yellow Flags:** Issues that require follow up. Common visual symptoms that may occur following concussion or blast exposure which may be related to trauma or premorbid/comorbid conditions (see Sidebar 3)

Sidebar 1A

Comprehensive Patient History

Concussion/mTBI history*

Specific visual symptoms and their clinical course

Mechanism(s) and details of injury/potential exposure	<ul style="list-style-type: none">▪ Blast▪ Blunt▪ Penetrating▪ Sports injury▪ Damage to eye glasses/protective equipment
Associated injuries	<ul style="list-style-type: none">▪ Tympanic membrane rupture▪ Facial laceration or fractures
Comorbidities	see Sidebar 4

*See VA/DoD Clinical Practice Guidelines for Management of Concussion/mild TBI

Sidebar 1B

Functional Vision Questions to Consider

- “Have you experienced any change in vision?”
- “Do you ever experience blurred vision (far or near?)”
- “Do you ever experience double vision?”
- “Have you experienced any vision loss?”
- “Do you ever experience sensitivity to light or glare?”
- “Do you see equally with each eye?”
- “Do you experience problems with balance or dizziness?”**
- “Do you have difficulty maintaining clear vision for extended time periods?”
- “Do you have problems reading across a page or computer screen?”
- “Do you get a headache when reading or using a computer?”
- “Have you experienced any changes to visual habits such as cell phone/texting use, driving, video games, etc?”
- “Do you see better if you tilt or turn your head?”
- “When do you notice visual problems?”
- “What were you doing when you noticed the visual problem?”

**See TBICoE Clinical Recommendation for the Assessment and Management of Dizziness Associated with Mild TBI

Sidebar 1C

Basic Eye/Vision Assessment

Basic Eye/Vision Assessment*

Visual acuity	<ul style="list-style-type: none"> Distance (right, left, together) Near card (right, left, together)
Monocular confrontation fields	<ul style="list-style-type: none"> Four quadrant finger counting (each eye)
Pupils	<ul style="list-style-type: none"> Size/equality Direct response to light Swinging flashlight test
Eye movements	<ul style="list-style-type: none"> Eye tracking (horizontal and vertical)
Nystagmus	<ul style="list-style-type: none"> Primary position Gaze evoked
External exam	<ul style="list-style-type: none"> Inspection Consider lid eversion for foreign body sensation Direct illumination of anterior segment
Slit lamp exam	If available

*Optional PCP Oculomotor Dysfunction Assessment

Test	Result	Referral
Letter test at distance monocularly	Difficulty reading letters at 20/40 level	Optometry/ Ophthalmology
Cover/uncover test	Eye movement observed or patient reports target movement (vertical or diagonal only)	
Near letter test** monocularly	Difficulty reading letters at 20/40 level	
Near letter test** binocularly	Difficulty reading letters at 20/40 level or monocular performance better than binocular	

** Perform near letter test at the standard distance of 40 cm (16 in) and consider moving the target up to 20 cm (8 in) to evaluate accommodative amplitude on patients under age 40

Sidebar 2

Red Flags and Referral to Specialist

Red Flag	Specific Red Flags	Referral (Facility-specific)
Vision loss or decline	<ul style="list-style-type: none">▪ Monocular/binocular▪ Field loss/scotomas▪ Transient	Ophthalmology/ Optometry
Diplopia	<ul style="list-style-type: none">▪ Double vision	Ophthalmology/ Neurology/ Optometry/ Neuro-ophthalmology
Abnormal pupils	<ul style="list-style-type: none">▪ Anisocoria (non-physiologic)▪ Afferent pupillary defect▪ Impaired reactivity▪ Irregular shape	Ophthalmology/ Neurology/ Optometry/ Neuro-ophthalmology
Abnormal external exam	<ul style="list-style-type: none">▪ Ptosis▪ Proptosis▪ Subconjunctival hemorrhage▪ Hyphema▪ Foreign body	Ophthalmology/ Optometry
Trauma	<ul style="list-style-type: none">▪ Ocular (including eyelid)▪ Facial▪ Polytrauma/moderate-to-severe TBI	Neurosurgery/ Ophthalmology/ Oral Surgery/ Maxillofacial (Plastic) Surgery/ Otolaryngology/ Optometry
Abnormal eye movements	<ul style="list-style-type: none">▪ Restricted gaze▪ Uncoupled eye movements▪ Nystagmus	Ophthalmology/ Neurology/ Optometry/ Neuro-ophthalmology
Abnormal visual behavior	<ul style="list-style-type: none">▪ Bumping into things▪ Lack of visual recognition	Ophthalmology/ Neurology/ Optometry
Acute ocular symptoms	<ul style="list-style-type: none">▪ Severe eye pain▪ Flashes and/or floaters▪ Severe photophobia	Ophthalmology/ Optometry

Sidebar 3

Yellow Flags and Referral to Specialist

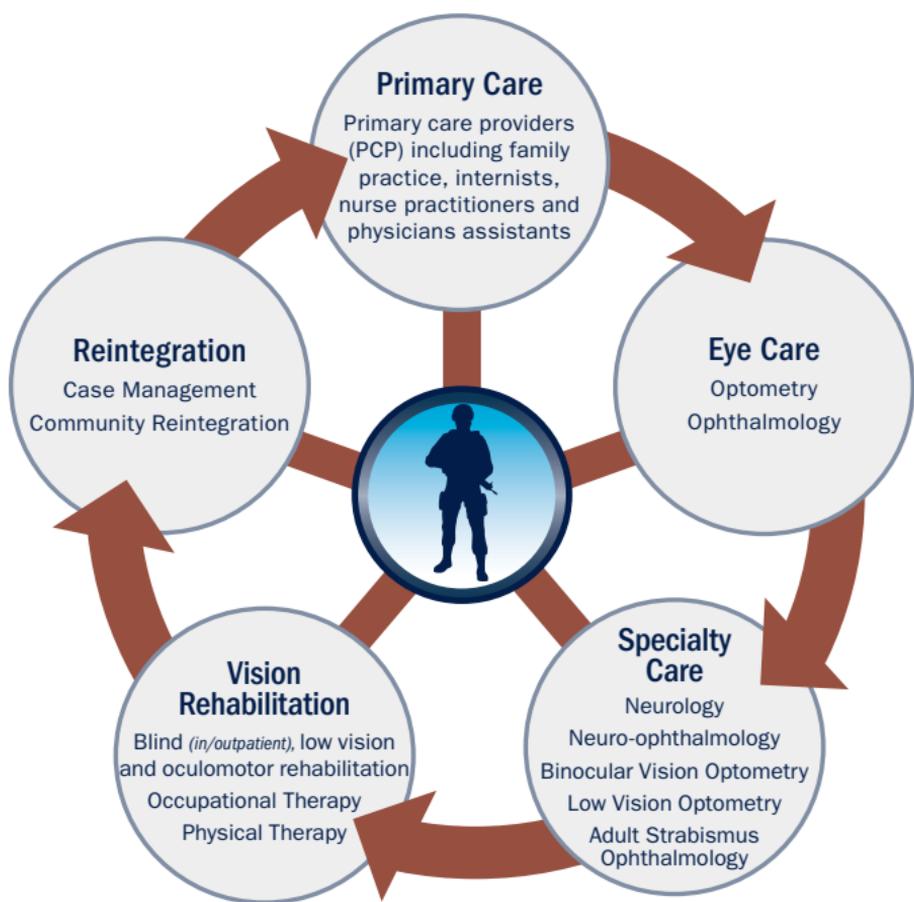
Yellow Flag	Specific Yellow Flags	Referral (Facility-specific)
Visual dysfunction	<ul style="list-style-type: none">▪ Eyestrain, blurred vision, difficulty focusing, ocular fatigue, difficulty reading, impaired depth perception▪ Problem with sustained vision tasks▪ Photophobia without associated headache▪ Color deficit	Optometry/ Ophthalmology
Neurologic symptoms	<ul style="list-style-type: none">▪ Uncontrolled headache with photophobia▪ Dizziness/vertigo▪ Visual neglect (right- or left-sided)	Neurology/ Neuro- ophthalmology
Physical exam finding	<ul style="list-style-type: none">▪ Abnormal head posture/ eye alignment or head turn (possibly compensating for visual problems)	Optometry/ Ophthalmology/ Neurology/ Neuro- ophthalmology

Sidebar 4

Continued Evaluation and Comorbidities

Comorbidities	<ul style="list-style-type: none">▪ Migraine▪ Sleep disturbance▪ Chronic pain▪ Additional injuries/illnesses▪ Medication side effects/drug interactions▪ Mood disorders▪ Posttraumatic stress disorder (PTSD)
Medications	Evaluate

Continuum of Care for Visual Dysfunction Following mTBI



PUID 4781.1.2.4

Released January 2013 | Reviewed February 2021
by the Traumatic Brain Injury Center of Excellence.

This product is reviewed annually and is current until superseded.
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