Table 1. Definitions of mild traumatic brain injury used and modifications made

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| **Definition Number** | **Lead author** | **Original definition** | **Adjustments and Clarifications** | **No of citations\*** |
|  |  | ***GCS Alone*** |  |  |
| 1 | Hollingworth31 | GCS 13-15 and blunt head traumaExclude penetrating injury | No change | 5 |
| 2 | Pentland32 | GCS 13-15 | No change | 2 |
|  | ***GCS and Clinical Symptoms*** |  |  |  |
| 3 | Levin33 | GCS 13-15 and LOC<30 min and closed head traumaExclude: penetrating injury, present >24 hours since injury | LOC<30 min = LOC <5 min | 31 |
| 4 | Hawley34 | British Society of Rehabilitation Medicine (BSRM)35:GCS 13-15 and LOC<15 minutes | LOC<15 minutes = LOC< 5 minutes | 15BSRM- 0 |
| 6 | Halley36 | GCS 13-15 and closed head injury and LOC/ amnesia <5 minutesExclude: intoxicated or suspected non-accidental injury | No change | 3 |
| 8 | Babikan37 | AIS 1-2:381: GCS 15 and at least two: nausea, vomiting, headache, dizziness or a concussion diagnosis which includes any of: diplopia, ringing in the ears, or seeing stars symptoms usually disappear in the emergency room. 2: GCS 13-14 and LOC< 1 hour or some symptoms with or without skull fracture or no neurological deficits and level of consciousness and sensorium improving  | 1: No nausea, dizziness,diplopia, ringing in the ears or seeing stars2: Considered ‘some symptoms’ to be the same symptoms as outlined for criteria 1. LOC <1 hour= LOC >5 min‘level of consciousness and sensorium improving’ = no deterioration in GCS | 11AIS- 603 |
| 7 | Grubenhoff39 | 1. Isolated blunt head trauma <24 hours and
2. with altered mental state: isolated blunt head trauma <24 hours and: GCS 13-14/witnessed LOC (time undefined)/PTA

Exclude: alcohol and open skull fracture | No change  | 6 |
| 4 | Yeates40-44 | Blunt head trauma and: LOC< 30 minutes or GCS 13-14, or at least two of the following symptoms: PTA, transient neurological deficits, vomiting, nausea, headache, diplopia, dizziness, disorientation, and other mental status changes (i.e., dazed, foggy, slow to respond, lethargic, confused, asks repetitive questions sleepy)Exclude: neurological deterioration | LOC<30 min = LOC <5 min “transient neurological deficits” = those resolved before discharge.No nausea, double vision or dizziness available. ‘foggy and asks repetitive questions’= did not include‘dazed’ = slow to respond or altered mental state. ‘lethargic and sleepy’= drowsy | 396 |
| 5 | Tham45 | GCS 13-15 and any period of transient confusion/disorientation/impaired consciousness. PTA<24h or neurologic or neuropsychological dysfunction | ‘transient confusion/disorientation’ = disorientated or PTA‘neurologic dysfunction’= neurologic deficits.‘neuropsychological dysfunction’ unavailable  | 11 |
| 10 | Gagnon46-48 | ACRM7: any LOC; 2) any loss of memory for events immediately before or after the accident; 3) any alteration in mental state at the time of the accident (e.g., feeling dazed, disoriented, or confused); and 4) focal neurological deficit(s) that may or may not be transient; but where the severity of the injury does not exceed the following: i) LOC of approximately 30 mins or less; ii) after 30 mins, GCS 13–15; and ii) PTA ≤ 24 hours | ‘any loss of memory’= PTA‘any alteration in mental state’ = disorientated/altered mental state. LOC>30 minutes = LOC >5 minutesGCS 13-15 at arrival PTA >24hours = unavailable | 124 ACRM- 681 |
|  | ***GCS, Clinical Symptoms and Neuroimaging*** |  |  |  |
| 11 | Roncadin49 | GCS (or children’s modified GCS) 13-15 and loss/ disruption of consciousness <15 min and no neurosurgical intervention, and negative neuroimaging other than linear skull fractureExclude: inflicted injury, gun shot injury | Loss/ disruption of consciousness <15 min = LOC <5 minutes/drowsiness | 12 |
| 12 | Anderson50-53 | GCS 13-15 and no abnormality on CT/MRI scans and no neurologic deficits and altered consciousnessExclude: neurologic/radiologic abnormalities, or suspected non-accidental injury | No change considered ‘altered consciousness’ = any LOC/drowsiness. | 587 |
| 15 | Blinman54 | GCS (or children’s modified GCS) 15 and blunt head trauma and no focal neurologic examination findings and negative head CT scan. However CT only for: LOC/ amnesia/ headache/seizure/nausea/ vomiting/confusion/sleepiness  | Confusion = disorientatedSleepiness = drowsyNo nausea | 13 |
| 14 | Spencer55 | GCS 14-15 and with or without abnormalities on head CT scansExclude: penetrating injury | No change | 1 |
| 13 | Luis56 | GCS 13-15 and normal CT scan and neurologic examination findings, and absence of depressed skull fracture | No change | 9 |
|  | ***Clinical Symptoms Only*** |  |  |  |
| 16 | AbdelMalik57 | Grade 2-4 of 7 grade head injury system (Geyde58)Grade 2: minor head injury and no LOC and no history of being stunned or dazedGrade 3: minor head injury with momentary LOC only or history of being stunned or dazedGrade 4: head injury with LOC more than momentary but less than 1 hour, and/or dizziness, confusion, and/or behavioral changes in the days following. AbdelMalik defined momentary as <2 minutes | Grade 2: Stunned or dazed =1Grade 3: Stunned or dazed =slow to respond or altered mental state. ‘Momentary LOC’ = LOC 5- 5minsGrade 4: LOC = >5 min. Confusion= any PTA. No behavior change in days following or dizziness.  | 17Geyde- 82  |
| 17 | Korinthenberg59 | LOC<1 min or not at all and ability to answer questions at time of admission and no intensive care admission or contusion/intracranial haemorrhage | LOC<1 min =LOC<5 seconds.‘ability to answer questions at time of admission’ = not slow to respond or altered mental state  | 7 |

GCS= Glasgow Coma Scale, LOC= Loss of consciousness, PTA= post-traumatic amnesia, AIS= Abbreviated Injury Scale, ACRM = American Congress of Rehabilitation Medicine, min= minutes \*citations sourced from PubMed