Appendix 2

Multi-State Surveillance Quality Improvement Review on TBI and Related Diagnoses

Reviewer Manual

Updated: Wednesday, January 23, 2019

PROJECT VARIABLES (CO indicates Colorado only)

DEMOGRAPHICS

Study Name (STUDY_NAME)

Definition: The name of the stratum to which the record belongs.

Values: Skull fracture without intracranial injury
Intracranial injury with or without skull fracture
Head injury not otherwise specified (NOS)

Study Number (STUDY_No)

Definition: The number of the stratum to which the record belongs.

Values: 2A = Skull fracture without intracranial injury
2B = Intracranial injury with or without skull fracture
2C = Head injury not otherwise specified (NOS)

Notes: The study numbers 2A, 2B and 2C relate to Colorado. Massachusetts, Maryland and Kentucky may use different identifiers, if at all.

Corporation (CORP) (CO)

Definition: The corporate affiliation, if any, of the facility.

Example: Centura

Facility (SFAC) (CO)

Definition: The facility at which the patient was evaluated.

Notes: Data item imported from electronic billing database.

Example: Castle Rock Adventist

CHA ID (CHAID) (CO)

Definition: The unique identification number assigned to the facility by the Colorado Hospital Association
Values: 3-digit number

Notes: Each state will have different numbering schemes obtained from their electronic billing sources. This number is useful in merging case lists and request letters.

Example: Colorado Hospital Association ID 342 (Centura Castle Rock Adventist Hospital)

Name (LNAME, FNAME)

Definition: The patient's last and first names as listed on the facesheet in the medical record.

Example: SMITH, John

Sex (SEX) (CO)

Definition: The patient's sex as reported in the electronic billing database or as documented on the facesheet of the medical record.

Values: M = Male
F = Female
U = Unknown

Notes: Accept the answer as reported by the electronic billing database or as documented on the facesheet, regardless of other documentation in the record. If sex is not documented on the facesheet and not imported from electronic billing database, choose "Unknown".

Age (AGE)

Definition: The patient's age at the time of admission to the emergency department.

Values: Variable, up to 3 digits

Notes: This study includes all ages with two main age groups: Age 5 and under (the patient has not reached their 6th birthday) and age 6 and over. Confirmation of accuracy of age and parsing of age groups will occur in the analysis stage.

Medical Record Number (MRN)

Definition: Medical record number as assigned by facility.

Notes: The MRN might begin with a leading zero. Adjust the database field to accept a leading zero.

Example: Centura Castle Rock Adventist Hospital MRN J0155277

ANON ID (ANONID) (CO)

Definition: Anonymous identifier assigned to the patient.

Notes: The anonymous identifier as assigned by electronic billing database or as assigned by state reviewer.

DOB (DOB) (CO)

Definition: The patient's date of birth as submitted by electronic billing database.

Notes: Use m/d/yyyy format.

Examples: 4/19/2010

Corrected DOB (CDOB) (CO)

Definition: The date of birth as recorded on the facesheet of the patient's medical record in the event of a mismatch.

Notes: If comparison of the date of birth as submitted by electronic billing database and that recorded on the facesheet reveals a mismatch, use this variable to document the date of birth recorded on the facesheet. If they match, leave this field blank. Use m/d/yyyy format.

Examples: 4/19/2010 [changed from reported DOB of 4/9/2010]

DOD (DOD) (CO)

Definition: The patient's date of discharge as reported by electronic billing database or as documented on facesheet.

Notes: If date of discharge is not known, enter Unknown.

Examples:
Date of discharge on facesheet: 4/9/2016
Date of discharge not available: Unknown

Corrected DOD (CDOD) (CO)

Definition: The date of discharge as recorded on the facesheet of the patient's medical record in the event of a mismatch.

Notes: If comparison of the date of discharge as submitted by electronic billing database and that recorded on the facesheet reveals a mismatch, use this variable to document the date of discharge recorded on the facesheet. If they match, leave this field blank.

Examples: 4/10/2016 [changed from reported DOD of 4/9/2016]

Injury Event (INJURY)

Definition: Any external strike, force of acceleration/deceleration, or explosive force/shock wave.

Values: 0 = No: Stop review
1 = Yes, known
2 = Yes, suspected

Notes:

- If no definite or suspected injury event is documented or a coding error has occurred and the answer to this variable is 0 = No, stop the review. Document this under Optional Reviewer Comments.
- This variable addresses any general injury event. "Known" and "suspected" do not refer only to TBI or concussion.
- If found down, continue with review and choose 2 = Yes, suspected.
- Any documentation in the record is valid, regardless of the informant.

Examples:

- "Coach states patient struck in head by line drive." Choose 1 = Yes, known.
- "EMT report states patient was passenger in car accident. Burst pattern break in windshield on that side." Choose 2 = Yes, suspected.
- "The patient was found down with a goose egg on his forehead." Choose 2 = Yes, suspected.
- "The patient complains of headache for a week." No injury noted. 0 = Choose No.

Injury due to abuse (ABUSE)

Definition: Documentation indicates the injury was secondary to abuse.

Values: 0 = No
1 = Yes, known
2 = Yes, suspected

Notes:

- The focus is on acute abuse resulting in an acute injury and not history of past abuse.
- If social services, state child/adult protective agencies, law enforcement or other similar entities were involved in the case upon presentation to the ED or were contacted by ED staff, choose 2 = Yes, suspected.
- This variable applies to all ages.

Examples:

- "This 87-year-old male is admitted with complaints of headache and dizziness after being assaulted by his caretaker." Choose 1 = Yes, known.
- "This 4-year-old is admitted after having fallen and hitting her head. She was in the ED 2 months ago for suspected child abuse." Choose 0 = No.
- Child Protective Services was contacted upon admission to the ED. Choose 2 = Yes, suspected.

Date of admission (DOA)

Definition: The date the patient was admitted to the ED as listed on the facesheet.

Notes: Use m/d/yyyy format. This format is one of the standard options available in Excel under Number Format, Date, Category, Type. This variable is used to calculate the time frame of the injury event.

Example: Date of admission: 3/12/2017

Time of admission (TOA)

Definition: The time the patient was admitted to the ED as listed on the facesheet.

Notes: Use hh:mm AM/PM format. This format is one of the standard options available in Excel under Number Format, Time, Category, Type. This variable is used to calculate the time frame of the injury event.

Example: Time of admission: 2:45 PM

Date of injury (DOI)

Definition: The date the injury event occurred.

Notes:

- Use m/d/yyyy format. This format is one of the standard options available in Excel under Number Format, Date, Category, Type. This variable is used to calculate the time frame of the injury event.
- This information may be found on the EMT report or in ED physician documentation.
- If the exact date of injury is not documented, type "Unknown." This will cause the variable HOURS to populate with the error message #VALUE!," the appropriate indicator that variable DOI is unknown.

Examples:

- Date of injury: 3/12/2017 (EMT report)
- "The patient fell yesterday morning". Date of admit 3/12/2017; document date of injury 3/11/2017.
- "The patient fell a day or two ago". Enter "Unknown."

Time of injury (TOI)

Definition: The time the injury event occurred, if known.

Notes:

- Use hh:mm AM/PM format. This format is one of the standard options available in Excel under Number Format, Time, Category, Type. This variable is used to calculate the time frame of the injury event.
- This information may be found on the EMT report or in ED physician documentation.
- IMPORTANT: If the time of injury is not documented, type "Unknown." The variable HOURS will populate with the error message #VALUE!," the appropriate indicator that variable TOI is unknown. Leaving this field blank will cause an improper calculation of the elapsed time in variable HOURS.

Examples:

- Time of Injury: 7:15 AM (Per EMT report). Enter exact time.
- "The patient fell between 7 and 8 AM this morning." Enter "Unknown."
- "The patient was found down this morning." Enter "Unknown."

HOURS (HOURS)

Definition: Calculation of the hours elapsed between the injury event and admission to the emergency department.

Notes: If the date and time of injury are documented, the Hours field will autocalculate the elapsed time with this Excel equation:
=((Date of admission+time of admission)-(Date of injury+time of injury))*24

Time Frame (TIME_FRAME)

Definition: Documentation of the number of hours between the injury event and the time of admission.

Values:
<1 hour
1-11 hours
12-23 hours
24-48 hours
>48 hours
Unknown

Notes:

- Variability in reporting will determine whether or not a calculation under variable HOURS can be made.
- If date and time of injury are not known but a ballpark time frame is documented in the record, choose the appropriate time frame based on that figure.
- If date and time of injury are not documented or if the patient was found down, choose Unknown.

Examples:

- Per EMT note, the accident occurred at 3/12/2017 at 7:15 AM. (Date and time of admission 3/12/17 at 10:30 PM. HOURS calculates 15.25 hours.) Choose time frame 12-24 hours.
- "Patient fell 3 or 4 hours prior to admission." Choose time frame 1-11 hours.
- "Patient was found down at 8 AM." Choose Unknown.

SIGNS AND SYMPTOMS OF TBI

Overall question: Within the medical record, was there mention of the following signs and/or symptoms listed?

Description: Documentation includes, but is not limited to, EMT records and ED physician notes.

Values:
0 = No: Patient/informant denies symptom.
1 = Yes, known: Patient/informant acknowledges having the symptom or the provider documents signs.
2 = Yes, suspected: Symptom may have occurred but patient/informant uncertain.

Examples:

"The patient vomited in the ambulance." 1 = Yes, known for N/V.
"The patient does not recall dizziness. EMT states bystanders observed the patient to be unsteady on feet but was able to walk to ambulance." 2 = Yes, suspected for Dizziness.
"The patient denies double vision or blurriness." 0 = No for Change in Vision.

Age <6: Change in eating/nursing (SIX_EAT)

Description: Change in the child's normal pattern of eating, drinking or nursing.

Examples: "The child has been refusing his bottle." Choose 1 = Yes, known.

Age <6: Loss of interest in toys/activities (SIX_INTEREST)

Description: Change in the child's normal interest in enjoyable activities.

Example: "The child has been inconsolable since the fall and throws his teddy bear." Choose 1 = Yes, known.

Dazed, foggy, confused, unclear thinking (DAZED)

Description: Dazed, foggy, confused, disoriented, or not able to think clearly.

Examples:

- "The patient states 'I feel like I'm in a fog.'" Choose 1 = Yes, known.
- The patient complains of fuzzy thinking since the accident. Choose 1 = Yes, known
- Husband states the patient was alert and coherent after the fall. Choose 0 = No.

Memory Problems (MEMORY)

Description: Difficulty remembering what happened just before or after the injury event, difficulty recognizing people or places or learning new things.

Notes: This variable may be based on the patient's response regarding remembering or other physician documentation (e.g., ability to remember 3 objects immediately and at 5 minutes).

Examples:

- "The patient is amnestic for the event." Choose 1 = Yes, known.
- "The last thing the patient remembers is backing out of the driveway an hour ago." Choose 1 = Yes, known.
- "The patient remembers 3 objects immediately but only 2 objects at 5 minutes." Choose 2 = Yes, suspected.
- "The patient reports normal memory." Choose 0 = No.

Loss of Consciousness (CONSCIOUS)

Description: Loss of consciousness.

Notes: Also referred to as syncope or fainting. Loss of consciousness might be reported via bystanders' observations.

Examples:

- "Friend states the patient passed out for a few minutes." Choose 1 = Yes, known.
- "The patient recalls waking up on the ground." Choose 1 = Yes, known.
- "Husband states the patient was awake throughout the event." Choose 0 = No.

Nausea or Vomiting (NAUSEA)

Description: Nausea or vomiting that occurred early on following the injury event.

Examples:

- "Patient reports an upset stomach since the injury." Choose 1 = Yes, known.
- "EMT reports patient vomited in the ambulance." Choose 1 = Yes, known.
- The patient vomited with morning sickness but none since the injury. Choose 0 = No.

Headache (HEADACHE)

Description: Headache including pain or feeling pressure in the head subsequent to injury event.

Examples:

- "The patient complains of a throbbing headache since the injury event." Choose 1 = Yes, known.
- "The patient is unsure if he had a headache after the event." Choose 0 = Unknown.

Dizziness/Poor Balance, Uncoordinated (DIZZY)

Description: Dizzy, uncoordinated, had poor balance, was stumbling around, was moving more slowly than usual, or had imbalance on gait testing (e.g., tandem walk ability normal/able vs abnormal; speed normal vs decreased).

Notes:

- Documentation of the patient having exhibited these symptoms, whether self-reported or reported by bystander.
- A positive Romberg test, failed rapid alternating movement exam and failed finger-to-nose testing should be considered 1 = Yes, known.
- Vertigo: Sensation of spinning often accompanied by nausea and vomiting.
- Disequilibrium: Sensation of being off balance and not usually associated with vomiting/nausea.

Examples:

- "Husband states patient was staggering like she was drunk." Choose 1 = Yes, known.
- "Romberg test is positive." Choose 1 = Yes, known.
- "The patient reports no difficulty with gait or balance." Choose 0 = No.

Change in Vision (VISION)

Description: Blurred vision, double vision, or decreased vision as compared to pre-injury state.

Notes: This variable may be based on the patient's response regarding vision or on physical examination (e.g., Snellen eye chart results).

Examples:
- "The patient reports seeing spots in his right visual field since his injury." Choose 1 = Yes, known.
- "The patient lost his glasses in the accident and states his vision is blurry because of that." Choose 0 = No.

Poor concentration (CONCENTRATE)

Description: Difficulty concentrating or easily distractible.

Notes: This variable may be based on the patient's response regarding concentration or other physician documentation (e.g. difficulty with serial 7's, difficulty with saying months of year backwards, or difficulty spelling "world" backwards).

Example:
- "The patient is unable to count backwards by 7's from 101." Choose 1 = Yes, known.
- "The patient is able to concentrate on his work." Choose 0 = No.

Sensitivity to noise or light (NOISE_LIGHT)

Description: Noise or light are disturbing or painful to the patient.

Examples:
- "The patient complained that the lights in the exam room were hurting his eyes." Choose 1 = Yes, known.
- "The patient denies sensitivity to light or sound." Choose 0 = No.

Irritability/Change in mood or personality (MOOD)

Description: Change in mood or personality such as irritability, nervousness, anxiety, feeling more or less emotional or sad, or feeling more bothered by things.

Notes: These symptoms may be reported by informants who observed the patient subsequent to the injury event.

Examples: "Wife reports the patient is normally a calm person but has been angry and snapping at her since the accident." Choose 1 = Yes, known.

Drowsiness/Change in sleep (SLEEP)

Description: Difficulty falling asleep, more drowsy than usual, or sleep quantity is noticeably more or less than usual.

Examples:
- "The patient states he has difficulty staying awake and wishes he could take a nap." Choose 1 = Yes, known.

- "The patient states she is sleeping normally since the accident." Choose 0 = No.

Speech problems (SPEECH)

Description: Slurred speech, inability to speak (aphasia) or other speech problem.

Examples: "The patient was observed to be slurring his words after the accident." Choose 1 = Yes, known.

Hearing problems (HEARING)

Description: Ringing in the ears (tinnitus) or other change in hearing.

Examples: "The patient reports a loud buzzing sound in his ears since the injury." Choose 1 = Yes, known.

Weakness/numbness (WEAKNESS)

Description: Motor or sensory loss including weakness, numbness or tingling.

Examples: "The patient complains of numbness and tingling in his fingers since the accident." Choose 1 = Yes, known.

OTHER FACTORS/INDICATORS

Alcohol/Drugs (ALCOHOL_DRUGS)

Definition: Any signs of alcohol or drug intoxication noted.

Values: 0 = No: No signs of alcohol/drug use or intoxication are report or observed.
1 = Yes, known: Documentation indicates alcohol/drug use associated with event, either by observation or positive laboratory testing.
2 = Yes, suspected: Documentation indicates suspicion of alcohol/drug use associated with event but not confirmed.

Notes: Includes documentation of blood alcohol level, toxicology screen, alcohol on the breath or any mention of drug use mentioned by patient/informant or as observed by the EMT or physician.

Examples:

- "The patient denies drinking but breath smells strongly of alcohol." Choose 2 = Yes, suspected.
- "Alcohol ingestion suspected but BAL is negative." Choose 0 = No.
- "Tox screen positive for opioids." Choose 1 = Yes, known.

Alcohol/drugs documentation (ALC_DRUG _DOC)

Definition: Any documentation in the record regarding alcohol/drug use or intoxication.

Notes: Free text field for documentation of blood alcohol level, toxicology screen, alcohol on the breath, needle track marks, etc. If variable Alcohol/Drugs was 0 = No, leave blank.

Dementia (DEMENTIA)

Definition: Dementia listed in patient history or by caregiver/family member report.

Notes: "Dementia" includes Alzheimer's or other condition documented as "with dementia."

Values: 0 = No: Patient/informant denies any form of dementia.
1 = Yes, known: Documentation or report of dementia in some form.
2 = Yes, suspected: Documentation or report of suspicion of dementia.

Examples:

- "Wife states the patient was diagnosed with Alzheimer's 2 months ago." Choose 1 = Yes, known (Alzheimer's is a form of dementia).
- "Patient has early-onset Parkinson's." Choose 0 = No (no mention of dementia).

Dementia documentation (DEMENTIA_DOC)

Definition: Any documentation in the record regarding dementia.

Notes: Free text field for documentation of dementia. If variable Dementia was 0 = No, leave blank.

Imaging (IMAGING)

Description: Documentation of whether or not imaging (CT, MRI or x-ray) of head was performed, with or without contrast medium (for CT or MRI studies).

Values:

For CT and MRI:
0 = No imaging performed
1 = Yes, imaging performed with contrast medium used
2 = Yes, imaging performed without contrast medium used
3 = Yes, imaging performed but contrast medium not documented

For x-ray:
0 = No imaging performed
1 = Yes, imaging performed

Positive results (POSITIVE)

Definition: If positive results are noted on imaging, document the radiologist's impression verbatim.

Notes:

- If imaging was normal, leave blank.
- If more than one imaging technique was used, document which technique the radiologist's impression addresses.

- Skull bones include vault including frontal and parietal bones; base of skull including occipital condyle, anterior fossa, ethmoid sinus, frontal sinus, middle fossa, orbital roof but not floor, posterior fossa, sphenoid and temporal bones; other specified skull bones; and unspecified skull bones.
- Positive results for an intracranial injury include intracranial hemorrhage (e.g., subdural, epidural, subarachnoid, intracerebral, or intraventricular bleeding), traumatic intracerebral hemorrhage, acute traumatic intracerebral hemorrhage, delayed traumatic intracerebral hemorrhage, traumatic brain injury, and traumatic intracranial hemorrhage.

Examples:
- If x-ray and MRI both done: X-ray shows depressed fracture of left parietal bone. MRI with contrast shows subdural hematoma.
- "Skull x-ray reveals fracture of the left maxilla." Leave blank as maxilla is a facial bone, not a skull bone.

Other TBI-related Symptoms (OTHER_SX)

Description: Documentation of any other potential TBI-related signs or symptoms.

Values: 0 = No
1 = Yes

Specify Other TBI-related Symptoms (SPECIFY_SX)

Definition: If variable Other TBI-related Symptoms was answered 1 = Yes, specify the symptoms as noted in the record.

Values: Free text field

Notes: There might not be other symptoms. Other symptoms include objective findings documented by physician and might include, but are not limited to:
- Restlessness
- Combativeness
- Biting
- Dilation of one or both pupils
- Clear fluids draining from the nose or ears
- Penetrating brain injury
- Seizures/convulsions
- Paralysis

Symptom Inventory (SX_INVENTORY)

Definition: Documentation of an assessment of TBI with any type of symptom inventory.

Note: Do not count review of systems (ROS) or Glasgow Coma Scale (GCS) as symptom inventories.

Values: 0 = No

1 = Yes

Examples: Inventories may include but are not limited to:

- Post-Concussion Symptom Scale (PCSS)
- Health and Behavior Inventory (HBI)
- Post-Concussion Symptom Inventory (PCSI)
- Acute Concussion Evaluation (ACE)

Inventory Type (INVENTORY_TYPE)

Description: If variable Symptom Inventory was answered 1 = Yes, list the symptom inventories used.

Notes: See list under Symptom Inventory examples.

TBI-related Diagnosis (TBI)

Definition: Documentation of TBI, concussion or similar diagnosis.

Values: 0 = No
1 = Yes, known
2 = Yes, suspected

Notes:

- This must be documented in the ED physician's notes. Such documentation from other sources (EMT, nurse notes, radiology report) is not acceptable.
- Examples of medical terms indicating TBI or concussion include intracranial hemorrhage (e.g., subdural, epidural, subarachnoid, intracerebral, or intraventricular bleeding), traumatic intracerebral hemorrhage, acute traumatic intracerebral hemorrhage, delayed traumatic intracerebral hemorrhage, traumatic brain injury, and traumatic intracranial hemorrhage.
- Answer 0 = N if ruled out, negative, or if the only documentation is contusion of the head..
- Answer 1 = Yes, known if documentation indicates mild TBI, TBI, concussion, or other similar terminology.
- Answer 2 = Yes, suspected if ED physician diagnosis includes terms of uncertainty (e.g. "possible", "probable", "suspected", "rule in/out")

Reminder: ED records are outpatient records. Per ICD-10-CM 2019 Section IV.H Uncertain Diagnosis: "Do not code diagnoses documented as "probable", "suspected," "questionable," "rule out," or "working diagnosis" or other similar terms indicating uncertainty. Rather, code the condition(s) to the highest degree of certainty for that encounter/visit, such as symptoms, signs, abnormal test results, or other reason for the visit."

Examples:

- "Diagnosis: Mild TBI." Choose 1 = Yes.
- "Diagnosis: Rule out TBI." Choose 2 = Yes, suspected.
- "Diagnosis: Headache with nausea and vomiting. TBI ruled out." Choose 0 = No.
- "Diagnosis: Headache with nausea and vomiting." Choose 0 = No.

TBI Verbatim (TBI_VERB)

Definition: If variable TBI-related diagnosis was answered 1 = Yes, known or 2 = Yes, suspected, document verbatim how this was described.

Examples:

- "Diagnosis: TBI."
- "Diagnosis: Possible concussion with headache, nausea and vomiting."

Optional reviewer comments (REVIEWER_COMMENT)

Definition: List any other concerns to be discussed with the SQI team that the reviewer discovers during the review process.

Notes: This field can include feedback on any variables except those with a dedicated comment field.

Examples:

- "Record indicates the patient was admitted to 23-hour observation. The patient was not treated and released from the ED but not admitted, either."
- "The patient is a 10-year-old with severe autism and not communicative but shows change in eating habits."

Reviewer (REVIEWER)

Definition: Name of reviewer

Notes: Add reviewer names as needed to Data Validation and Variable Code table in Excel spreadsheet.

Date of review (REVIEW_DATE)

Definition: The date review and abstraction were completed.

Notes: Use m/d/yyyy format. CTRL ; will insert current date in Excel.