

## **TBI SURVEILLANCE NOTES—Revised 9/5/06**

This is an on-going list of issues related to TBI surveillance. If you have anything you would like added, let Tracy know. If you have questions on a particular case or are unsure how to code a particular variable, ask Pam or Tracy.

### **Completing/Omitting the Form** *(When in doubt, complete the entire form)*

**False Positives--**Fill out the entire form as best you can (may have to put not applicable/unknown on some questions) and mark the appropriate upper left corner. Include information in the memo as to why it was a false positive. Complete the entire form even if there is no TBI code or it appears that the patient did not have a TBI.

**Out of State Residents--**Fill out the form with only the “omit” variables (i.e., Date of Review, Reviewer, Hospital, Hospital Record #, Patient Name, SS#, Date of Admission, Date of Discharge, All ICD-9-CM Codes and E-Codes) and mark the appropriate box in the upper left corner.

**Not Discharged from the Hospital in the Year of Interest--**Fill out the form with only the “omit” variables and mark the appropriate box in the upper left corner. Note: Look at the discharge date—not the date of injury and check the list to make sure you have the right stay.

### **Dates**

Use four digit years in all dates.

### **Age**

Specify age in years. For patients less than 1 year old, mark age as 0.

### **Race**

The numbers next to the race categories on the form do NOT correspond to hospital race codes (ignore coding numbers—they’re only for data entry purposes). Each hospital may code race differently, so verify each individual coding scheme. In general, code race according to what is reported on the face sheet. If there is overwhelming evidence in the chart that contradicts the face sheet, then race may be modified. If the insurance is IHS, then race may be marked “Native American/Alaska Native,” unless the patient is a pregnant female. Mark people of Middle Eastern descent as white.

### **Hispanic**

If “H” or “Hispanic” is the only thing listed for race on the face sheet or referred to in other chart documentation, then record race as “Unknown” and Hispanic as “Yes.” Do not make assumptions on a patient’s ethnicity (e.g., based on their name). The large majority of the time, Hispanic will be marked “Unknown.”

### **Relative/Friend Contact Information**

Look for any and all relatives or friends listed in the chart that are not living with the patient and record any contact information available. Usually the face sheet contains an emergency contact, but other surgical/procedure consent forms have people listed as well. For patients who are children, include the name of a parent or guardian. For adults, and if applicable, a spouse's name may be helpful as well.

### **County of Injury**

If county of injury is not specified AND county of residence and county of hospital are the same, then you can assume that the county of injury is the same as well.

### **Work-Related Injuries**

If a patient was working (generally for compensation) at the time of injury or the insurance is worker's compensation, then mark "Yes." If the patient was driving to or from work when the injury occurred, then mark "No." Volunteers, such as firefighters, paramedics, etc., may be counted as workers, in addition to self-employed people or family members working at a family business or farm. Sometimes occupation will be listed as retired, but the patient was injured while working as a farmer, rancher, etc. In these instances, it is acceptable to mark "Yes." If there is no mention in the chart about the injury being work-related, the payer is not worker's compensation, and you feel reasonably sure that it is not work-related, it is acceptable to mark "No."

### **Insurance**

If the insurance fields on the face sheet are blank, check with the medical records staff to see if blank consistently means unknown or self pay. If the hospital is not consistent, then mark "Unknown." If "pending" is in the chart next to the patient's insurance type, then assume the patient does NOT have that form of insurance. For example, if the only type of insurance is "Medicaid-pending," then mark "Self pay." Make a note that there was a pending form of insurance and Tracy will check in the hospital discharge database and verify the payer. If the insurance is "Workers' comp," then assume that the injury was work-related. Only mark the type(s) of insurance reported by the hospital. If an injury is work-related, but "Workers' comp" is not listed as a payer, then do NOT mark it (some workers are not covered by worker's compensation). "Third party liability" or "other liability" should be marked as "Automobile ins." Insurance listed for an inmate should be marked under "Other gov't program."

### **Discharge Disposition**

If a patient is discharged to home hospice or assisted living, mark "Home." Intermediate care facilities are nursing homes. Some "nursing homes" or "retirement centers" have varying levels of care from assisted living to skilled nursing. Be sure to distinguish exactly where (what level) the patient was discharged. Specialty hospitals and long-term acute care hospitals (LTACs) should be categorized under "Skilled nursing facility."

### **ICD-9-CM Codes**

The form has space for 27 codes; however, if the chart has more than that, record ALL codes and use the margins if necessary. Record the codes in the order they are listed in

the chart, beginning with the principal diagnosis (do not record the admitting diagnosis). Do not leave spaces for the E-codes. Record any V-codes that are in the diagnosis code list (do not include the separate section of procedure codes). Do not add any extra digits to the codes (such as zeros to the end), but do insert a period as appropriate (e.g., 873.43 or V45.81). Occasionally, charts without a TBI code will be reviewed. These records were selected in the sample because the patient died and was given a TBI code on their death certificate (they may or may not have been coded as having a TBI by the hospital). These records should be reviewed as normal. In general, do not use the codes and code descriptions to answer specific questions about the injury, such as loss of consciousness, presence of intracranial lesion or skull fracture, etc.

### **Hospital E Codes**

No matter where it is listed in the chart, always record the “place” E-code (begins with E849) in the 2<sup>nd</sup> E-code field. Keep all other E-codes in order and record ALL that are listed in the chart. If there is no place E-code, put a dash in the #2 spot and continue recording in the #3 spot.

### **Assault/IPV**

For assault-related injuries, indicate whether or not the injury was due to intimate partner violence. IPV includes violence between spouses, boyfriend/girlfriend/same sex partners, and ex-spouses/dating partners.

### **How and How #2**

In answering how the injury occurred, use the check boxes to indicate the primary activity and use “How #2” if the patient could also fit into a second category. Use “How Specified” to give further detail on the incident as appropriate. On all falls, use “How Specified” to indicate *what* the patient fell off of (e.g., off bed, down stairs, etc.) or *why* the patient fell if s/he did not fall from something (e.g., tripped, had a seizure, etc.)

#### *Examples:*

Hit by a car while riding a bike—How=Bicycle and How #2=MVC

Riding a bike and fell off—How=Bicycle and How #2=Fall

Hit in the head by a batted ball while playing baseball—How=Sports activity and  
How #2=Hit by flying object

Fell off while riding a horse—How=Sports activity and How #2=Fall

Hit by a train while driving—How=MVC and How Specified=Hit by train

### **Level of Consciousness**

Use GCS if available and valid; otherwise, code this variable according to the patient’s lowest level of consciousness at the time of presentation to the hospital.

**Coma**—Patients who do not open eyes, obey commands, or utter words

**Moderate impairment of consciousness**—Patients who are difficult to arouse (e.g., require noxious stimuli), who cannot obey simple commands, or who speak in a manner inappropriate or incomprehensible.

**Minimal or no impairment of consciousness**—Patients who are awake or easily aroused by verbal stimuli, who can obey some simple commands, and who can speak comprehensively. Some disorientation may or may not be present.

### **Length of Unconsciousness**

If no specific amount of time is given, see if the chart has any of these keywords and mark the corresponding time frame.

Momentary	(≤5 min)
Several minutes	(6-30 min)
Brief	(≤5 min)
+LOC	(Unknown length LOC)
Transient	(≤5 min)
Less than 15 min	(6-30 min)
At the scene	(Unknown length LOC)
At arrival of EMS	(Unknown length LOC)
In the field	(Unknown length LOC)

If a patient faints and then wakes up while falling or immediately upon striking the floor or another object, then do NOT count it as a loss of consciousness. If the patient faints and remains unconscious for a while, count it as a loss of consciousness. LOC is measured starting at the time of injury until the moment the patient regains consciousness. Most neurological diseases except those accompanied by epilepsy or acute strokes do not cause patients to lose consciousness abruptly. Therefore, any LOC following a head injury in a patient with dementia, etc. can usually be attributed to the injury.

### **CT Scan/MRI**

Mark “Yes” if a CT scan and/or MRI of the head were done. If only a skull x-ray was done, select “No.” Examples of things NOT considered abnormalities related to TBI:

- Lacerations/contusions only to the face, eye, ear, or scalp (soft tissue) without other clinical case criteria
- Fractures only of facial bones (e.g., nasal, mandible, maxillary sinus, etc.) without other clinical case criteria
- Birth trauma and congenital malformations
- Primary anoxic, inflammatory, infectious, toxic, or metabolic encephalopathies that are not complications of head trauma
- Cancer/brain tumors
- Brain infarction (ischemic stroke, lacunar infarcts) and intracranial hemorrhage (hemorrhagic stroke) without associated trauma
- Atrophy without acute lesions, age-related changes, and preexisting lesions

If the imaging results were abnormal (likely due to TBI), then specify the results/findings using Ruth’s cheat sheet as a guide (attached to the end of this document). Include measurements, locations, and as much detail as is available. If the results were normal, there is no need to justify the finding or include any other written documentation.

### **Skull Fracture**

In cases with an orbital fracture, count “Yes” for skull fracture if the chart mentions a fracture to the roof, wall, or posterior part of the orbit and count “No” for skull fracture if the chart mentions a fracture to the base, floor, or inferior part of the orbit. Skull fractures may be inferred by the doctor without being directly visualized radiographically. In many cases, a depressed skull fracture may also be coded as evidence of an intracranial lesion (see next section).

### **Intracranial Lesion**

Traumatic intracranial lesions include brain hematomas and hemorrhages (epidural, subdural, subarachnoid, intracerebral); cerebral contusions or lacerations; diffuse or focal cerebral edema of any severity; hypodensities consistent with contusions; hyperdensities consistent with hemorrhages; subdural hygromas; and penetrating cerebral injuries (e.g., gunshot wounds). Depressed skull fractures are likely to be accompanied by underlying focal brain contusions or lacerations. In the absence of information to the contrary (e.g., a CT or MRI showing a normal brain), a depressed skull fracture may be coded as evidence of an intracranial lesion, in addition to skull fracture.

### **Amnesia**

Code this variable “Yes” if the patient forgot how the injury occurred or forgot any events immediately preceding or following the injury. Just because a patient loses consciousness or is only documented as being confused and/or disoriented, does NOT mean that s/he has amnesia. Amnesia cannot be assessed for infants or patients without language. Documentation of “memory lapses” is not specific enough to indicate injury-related amnesia in patients with advanced Alzheimer’s disease or severe alcoholism. When severe dementia or mental retardation disrupt memory and communication, it is impossible to determine if trauma-related amnesia is present. If amnesia cannot be assessed, select “Unknown.”

### **Clinical Case Definition**

Circle whichever option you see first documented in the chart; there is no need to look for the presence/absence of each element. Use these keywords to help quickly identify whether or not a patient meets the case definition (lists are not comprehensive).

**Decreased level of consciousness**—(noted by anyone, including patient, witnesses, medical personnel, etc.)—partial or complete loss of consciousness, stunned, dazed, lethargic, obtunded, coma; for infants, there may be some noticeable changes in behavior, such as unusual quietness, lethargy, or decreased arousal

**Amnesia**—patient is unable to remember the incident or events immediately preceding (retrograde amnesia) or following the incident (post-traumatic/anterograde amnesia); cannot be assessed for infants or patients without language

**Neurological abnormalities**—(noted by anyone)—abnormalities of motor function, sensory function, or reflexes; abnormal/unequal pupils, visual field loss, abnormal eye movements, facial movement weakness or asymmetry, post-traumatic seizures, posturing, paralysis/paresis (diffuse weakness not localized to any body region would NOT count), abnormalities of speech (aphasia or dysphasia), numbness, loss of

sensation, asymmetric reflexes, abnormal Babinski (normal is downgoing toes or negative Babinski), abnormal gait or balance, thrashing coma, ataxia

**Neuropsychological abnormalities**—(noted by anyone)—disoriented, confused, combative, aggressive, agitated, and other changes in cognition, behavior, or personality  
SIGNS AND SYMPTOMS SUCH AS HEADACHE, VOMITING, DIZZINESS, ETC. ARE TOO NONSPECIFIC TO BE CODED AS NEURO ABNORMALITIES. If a patient only has raccoon eyes/ecchymoses, pneumocephalus, Battle's sign, blood from ears/nose, or CSF from ears/nose and no other symptom meeting the above definition, then s/he does NOT count as a clinical case. A concussion or closed head injury alone without any other supporting documentation or symptoms (e.g., LOC, amnesia, etc.) is not sufficient for meeting the clinical case definition (patients with a concussion or mild TBI usually have normal CT scans).

### **AIS Score**

Leave this field blank. Ruth will assign AIS after surveillance is completed. See Ruth's cheat sheet (attached to the end of this document) for important information to document that will help her assign this score.

### **Glasgow Coma Score**

Do not score GCS yourself or pick a number based on other documentation. Only record the number specified in the chart. Valid numbers are from 3 to 15. Pick the lowest score if multiple sources report and make sure that the GCS is valid. That is, the GCS is only valid after the patient has been resuscitated (i.e., heart rate, blood pressure, and respiration are stable) and only when sedative or paralytic drugs have NOT been administered. GCS can be obtained from EMS run reports, ED documentation, or initial admission assessments. If a patient's GCS deteriorates during the hospital admission, keep the score obtained on admission and do not record scores from later in the stay (even if they are lower). Sometimes GCS will be reported with a T following (e.g., 3T); this score indicates that the patient was intubated when GCS was measured (the highest possible intubated score is 11T).

### **Glasgow Outcome Score**

GOS should be based on the patient's recovery from the TBI at discharge. Do not base your answer solely on where the patient went upon discharge. A good recovery would indicate a patient's return to baseline (status prior to the head injury). Nursing notes and discharge notes/assessments should be reviewed for information that indicates the patient's status. For patients with dementia or other preexisting mental conditions, GOS may be difficult to assess. The key is to determine if any abnormalities are thought to be new, acute, or worsened following the head trauma. In these instances, if the patient recovers and is mentally no worse off than their baseline status, it is acceptable to give them a good recovery. If a patient recovers from the TBI with very minor or no deficits, but goes to rehab or is dependent on others due to other medical issues (e.g., arm and pelvic fractures), it is acceptable to give them a good recovery. A patient who goes to rehab for only swallowing or speech deficits should be considered as having moderate disability. **IMPORTANT**—Since discharge to anywhere other than home may indicate an incomplete recovery, document somewhere on the form (in the memo or in the

margins by GOS or discharge disposition) why someone was given “Good recovery” when they were discharged to another hospital or rehab (e.g., rehab for femur fractures only, etc.).

### **Alcohol/Drug Use**

Starting with 2004 TBI surveillance, there was a policy change in how alcohol and drug use questions are answered (does not pertain to other injuries under surveillance). In general, if there is no mention in the chart of alcohol or drug use and a blood test was not performed, then “No” is marked for alcohol/drug use, rather than “Unknown.” Use “Unknown” for weird cases or where there is confusion over whether or not the patient was using. If the alcohol or drug screens are drawn one or more days after the injury and are reported as negative, but there is documentation to suggest that the patient was drinking or using drugs at the time of injury, then use the 777 code. Mind-altering drugs include cannabinoids, benzodiazepines, barbiturates, opiates, codeine, morphine, acetone, and cocaine. In a few cases, it may be difficult to ascertain whether observed abnormalities are due to a TBI or simply intoxication. Follow the physician’s notes or, in their absence, record any findings regardless of whether or not alcohol/drugs may have played a role.

### **Motor Vehicle Position**

If the incident involved a motor vehicle or specialized motor vehicle (e.g., ATV, dirt bike, motorized scooter, etc.), indicate the position of the patient as appropriate.

### **Place of Occurrence**

This variable helps verify the place of occurrence E-code. According to the ICD manual:

#### **Home:**

Includes apartment, noninstitutional place of residence (assisted living facility, etc.), private driveway, garage, garden, private sidewalk, swimming pool in private house or garden, yard of home

Excludes home under construction but not yet occupied (*industrial place/premises*), institutional place of residence (*residential institution*)

#### **Farm:**

Includes buildings, land under cultivation

Excludes farm house, home premises of farm (*home*)

#### **Mine/quarry:**

Includes gravel pit, sand pit, tunnel under construction

#### **Industrial place and premises:**

Includes building under construction, dockyard, dry dock, factory building premises, garage (place of work), industrial yard, loading platform (factory or store), industrial plant, railway yard, shop (place of work), warehouse, workhouse

#### **Place for recreation and sport:**

Includes amusement park, baseball field, basketball court, beach resort, football field, golf course, gymnasium, hockey field, lake resort, mountain resort, playground (including school playground), public park, racecourse, resort NOS, riding school, rifle range, seashore resort, skating rink, sports palace, stadium, swimming pool (public), tennis court, vacation resort

Excludes those things in a private house or garden (*home*)

**Public building (building and adjacent ground used by the general public or by a particular group of the public):**

Includes airport, bank, café, casino, church, clubhouse, courthouse, dance hall, garage building (for car storage), hotel, market (grocery, etc.), music hall, nightclub, office, office building, post office, public hall, radio broadcasting station, restaurant, school (state, public, private), shop (commercial), station (bus, railway, etc.), store, theater

**Residential institution:**

Includes children's home, dormitory, hospital, jail, nursing home, orphanage, prison, reform school

**Other specified places:**

Includes beach NOS, canal, desert, dock, forest, harbor, hill, lake NOS, mountain, parking lot, parking place, pond or pool (natural), prairie, public place NOS, railway line, reservoir, river, sea, seashore NOS, steam, swamp, woods

### **Sports and Recreation**

Participants in a sports or recreation activity should be marked as to what activity s/he was involved in at the time of injury. "How" or "How #2" do not necessarily need to be marked as sports activity in order to select a category in this variable. Note that there are categories for personal watercraft, playground equipment, biking, and ATV. If the patient was a spectator at a sports or recreation event, "other specified" should be selected and "spectator-baseball," "spectator-football," etc. should be noted in specify field.

**Extraction of Minimal Medical Record Information Necessary  
For Abbreviated Injury Score (AIS)  
Ruth**

Documentation for TBI (information likely in physician's notes, discharge summary, Hx/Physical, diagnostic findings, ED notes-perhaps) – Some are covered in specific questions on the form.

Record any information describing the brain injury, TBI ICD9 codes with description, and medical and hospital staff documentation. Document injury findings described by CT scan, MRI, surgery, x-ray, and angiography.

- **Part(s) of brain injured:** brain stem or/and cerebellum or/and cerebrum.
- **Clinical assessment terms**
  - o Unconscious, comatose
  - o Amnesia
  - o Concussion, no LOC, length of LOC

**Descriptive terms specific to skull fractures –**

- o blood from ears, nose
  - o cerebral spinal fluid (CSF) from ears/nose
  - o raccoon eyes
  - o battle signs
- (All are accepted signs for basilar skull fracture).
- o Complex (open), note if states “loss of brain tissue”
  - o Depressed – record measurement if given (i.e. 2 cm.)
- (For skull fractures in general, look for **part** and terms as simple, undisplaced, linear, etc.

**MRI/CT etc. procedures-findings** – always record specific part of brain noted and the terms:

- o pneumocephalus (air in the brain)
- o brain swelling [mild to severe, compressed or absent (effaced) ventricles/brainstem cisterns]
- o brain edema (mild to severe, compressed or absent (effaced) ventricles/brainstem cisterns)
- o infarction (due to trauma)
- o laceration (all types and include descriptions on size, depth, etc.)
- o contusion (all types and include descriptions on size, depth, etc.)
- o diffuse axonal injury (or white matter shearing). May state gray matter shearing.
- o hematoma – describe part and any documentation of size (small, large, massive) and any documentation of # of centimeters (cm) and/or cm. thickness.
- o hemorrhage – describe part and any documentation of size. may be described as volume (< 50 cc.), by thickness, or size.