pennsylvania TRAUMA SYSTEMS foundation

OUTCOMES OPERATIONAL MANUAL 2022

A REFERENCE TOOL FOR PENNSYLVANIA TRAUMA PERFORMANCE IMPROVEMENT

July 2022 *Grey Highlighted area = addition or revision*

Contents

Preface

This operations manual is intended to be a tool to orient new users of the Pennsylvania Outcomes registry and to be a reference tool for the more experienced user.

An ad Hoc Performance Improvement Standardization Committee was formed in 2006 and tasked with standardizing data entry and the process used to classify deaths and complications. The standardization was implemented in POPIMS (Performance Improvement software previously utilized in Pennsylvania) and later transitioned into use in PA v5 Outcomes software.

The Performance Improvement software:

- Identifies and focuses on outcomes in injured patients
- Identifies factors that impact patient outcomes
- Facilitates data entry and the ability to share outcome data with other trauma centers to improve care
- Improves the presentation of Performance Improvement in the site survey process
- Assists with inter rater reliability among participating centers
- Identifies death rates, based on classification status, for specific injury complexes to reduce morbidity and mortality
- Aggregates data in reports for continued monitoring and tracking of events.
- Assists in determining events that require follow-up and/or re-evaluation
- Assists in identifying priority events

We recognize the continued effort of the Pennsylvania Accredited Trauma Centers to collect accurate and complete data. We welcome any questions or comments to this document.

PATIENT SELECTION CRITERIA FOR INCLUSION IN OUTCOMES

All trauma cases entered into the Trauma Registry software are populated into the PA v5 Outcomes (Outcomes) software. Inclusion into the Trauma Registry comprises, at a minimum, those that meet the Pennsylvania Trauma Outcome Study (PTOS) Patient Inclusion Criteria. See the current PTOS Operational Manual for the Data Base Collection System (PTOS Manual) for the inclusion criteria. Including all patients in the Trauma Registry into the Outcomes software ensures that when a user generates a report, the denominator, or 'N', is available for the calculations. The required elements to be completed are listed below and require responses in the Outcomes software.

It is recommended that patients meeting the following criteria be reviewed. At minimum, consider reviewing negative outcomes.

Death	Including dead on arrival (DOA), deaths in the ED and deaths during any portion of the hospital stay. DOA is not formally defined within the Trauma Registry. Signs of Life element is used in the trauma registry for specific audit filter inclusion/exclusion. For example, patients arriving with CPR in progress without return of a pulse are recorded as no signs of life.
Hospital Events	As defined by the PTOS Manual (See Appendix A for definitions)
Process/System Issues	Audit Filters as defined by the PTOS Manual (See Appendix A for definitions)
Opportunities for Improvement	Deviations in care as defined in PTOS Manual (Appendix A)
User Defined Issues	Defined by the institution as being a deviation in care or another quality parameter (such as tracking new protocol) to assist in identifying ongoing care related issues

OPENING A RECORD

In the opening screen, click on Manager Records to open the Trauma Record Manager. The patients automatically listed in the Trauma Record Manager are those with an arrival date within the last 1 year. Highlight a record or multiple records from the list and select an action button for that record: Edit, View, Delete or Print. Can also double click on a record to Edit it. To display patients of a certain criteria click the **[Search]** button. The **[Search]** button allows for searches based on trauma number, arrival date range, discharge date range, name, record status, linkage number, medical record number or account number. The Advanced Search tab allows for a search based on PTOS inclusion, flagged status, hospital event, tracked event, meeting time, meeting name, meeting date, loop closure status, loop closure dates, and via a query from Report Writer. *Once you have entered your search criteria and in the 'Search Trauma screen, you have the ability to change the size of this selection box. Use the mouse and place the cursor on the corner of the box. By dragging the cursor, you can increase and decrease the size of this box to your specifications. The changes made will be saved for future use.*

PA V5 OUTCOMES ELEMENTS

Once a record is open the following elements will be displayed.

Tips for color-coding within the PaV5 Outcomes software:

- Any element in the software that is highlighted with yellow are required data elements and are to be submitted as part of the Central Site Submission to the PTSF Outcomes Central Site.
- Any element in the software that is highlighted with blue are optional data elements, and if completed, will be submitted as part of the Central Site Submission to the PTSF Outcomes Central Site.
- Any element in the software that is NOT highlighted (data element box remains white) is an optional data element, and if completed, will NOT be submitted as part of the Central Site Submission to the PTSF Outcomes Central Site.

Section 1: Patient Summary Tab

Data in the tabs in this section are automatically downloaded from the data in the Trauma Registry, EXCEPT the Massive Transfusion Protocol documentation in the Procedure tab in this section. Refer to the current PTOS Manual for additional details and definitions related to each Registry element. The information within this tab is refreshed each time you run the Interface. If you want to maintain any special information that should not be written over during a rerun of the interface, put it in the Outcomes Module tab in the Case Management section under the PIPS tab. ~~Also, elements in yellow are the~~ required ~~data points to be submitted as part of the Central Site Submission to the PTSF Outcomes Central Site.~~

Patient Information Tab

- **Submission Deadline**
- **Audit Log: POP OUT** the Audit Log identifies when the interface with Collector was initially created and when users enter data into Pa v5 Outcomes. It will track the date the record was initially created, initially closed, and the last modification made in Pa v5 Outcomes. Each will list the date and time, user, and facility. The second tab provides an audit of transfers. It will track the status of transferring the Pa v5 Outcomes record to the Central Site, the first transfer and the last transfer.
- **Facility**: Four-digit number assigned by the Pennsylvania Trauma Outcome Study to each participating hospital.
- **Linkage #:** The linkage number may be used to identify a patient if the medical record number is changed or deleted. This is an optional element defined by each facility.
- **PTOS Patient**: Is the patient a PTOS patient? Yes or No
- **PTOS Trauma Registry Status:** Active or Closed. This is the status of the record as it exists in the PTOS Registry. This must be a closed status in order to close it in Pa v5 Outcomes.
- **Trauma #**: Eight-digit number assigned by the hospital submitting the data form for each qualifying patient. The first four digits will represent the current year (year of ED admission) with the remaining digits determined by consecutive sequence numbering.
- **Medical Record #**: The number assigned by the hospital for the patients' medical record.
- **Abstractor:** The abstractor text will be imported from the trauma Registry "Misc." tab.
- **Patient Name**: Patient's Name – Last, First, Middle initial, and Suffix
- **Date of Birth**: MM/DD/YYYY format

- **Age**: The age of the patient in one of the following: Year, Months, Days or Estimated in years
- **Gender**: Male, Female, Non-binary
- **Injury:** Date in MM/DD/YYY format, and Time in HH:MM
- **Primary Mechanism:** Mechanism of Injury appropriate for this patient's cause of injury/accident. Refer to the current ICD-10 Coding Manual.
- **Cause of Injury**: The abstractor text of the cause of injury.
- **Injury Type**: The force causing the injury: Blunt, Penetrating, Burn, Skin. If there are two causes of injury, the mechanism of injury which caused the more severe injury is displayed. Example: patient was assaulted with fists (blunt) and stabbed (penetrating) resulting in a concussion and laceration of the lungs. Record as penetrating.
- **Scene EMS:** Scene provider EMS affiliate number and name, and PCR number
- **Transport EMS:** Transport provider EMS affiliate number and name, and PCR number
- **Referring Facility:** Referral facility number and name
- **Referring Facility LOS:** In days, hours and minutes in HH:MM format
- **Referral Facility EMS:** Interhospital EMS affiliate number and name, and PCR number
- **ED/Hospital:**
    - **Arrival:** Date in MM/DD/YYY format, and Time in HH:MM
    - **ED Discharge Time:** Date in MM/DD/YYYY, and Time in HH:MM that the patient was discharged from the ED. This is the date/time the patient is physically transported from the ED to their final post-ED destination.
        - If patient was a direct admission, EDA date and time are entered here.
    - **Post ED Destination:** The location the patient went to after the ED
    - **Initial Level of Alert:** First Level, Second Level, Third Level, Consult, Unknown or blank if no alert called
    - **Admitting Service:** The service that admitted the patient
    - **Trauma Alert Change:**
        - **1 – Upgraded**
        - **2 – Downgraded**
        - **3 – No change**
        - **? - Unknown**

          blank if no alert
    - **Admitting Physician:** Attending who admitted the patient. The physician code assigned per institution
    - **Revised Level of Alert:** First Level, Second Level, Third Level, Consult, Unknown, or blank if no alert called or no change
    - **Trauma Attending:** Attending who evaluated the patient in the ED. The physician code assigned per institution

- **Initial Assessment**
    - **Intubated:**
        1. 1 = Patient has an artificial airway when initial respiratory rate was assessed (nasotracheal, endotracheal, EOA, Cricothyroidotomy, needle or surgical).
        2. 2 = Patient does not have an artificial airway when initial respiratory rate was assessed
    - **Respiratory Rate Controlled:** Yes or No (when initial respiratory rate was assessed)
    - **Supplementation Oxygen:** Yes or No
    - **O2 Sat:** Admitting vital signs (within 30 minutes) for oxygen saturation
    - **Unassisted Respiratory Rate/Minute:** Admitting vital signs (within 30 minutes) for respiratory rate that was unassisted (when initial respiratory rate was assessed)
    - **Pulse**: Admitting vital signs (within 30 minutes) for pulse
    - **SBP:** Admitting vital signs (within 30 minutes) for systolic blood pressure

- **Glasgow Coma Score:** Admitting vital signs (within 30 minutes) for Glasgow coma score
    1. **Eye:** Glasgow coma score for eye opening, 1-4
    2. **Verbal:** Glasgow coma score for verbal response, 1-5
    3. **Motor:** Glasgow coma score for motor movement, 1-6
    4. **Total:** total eye, verbal and motor score, 3-15
- **GCS Qualifiers:** Identifies treatments given to the patient or condition that may affect the first assessment of GCS.
    1. **Paralyzed:** Due to chemical paralysis, Yes or No
    2. **Intubated:** Yes or No
    3. **Sedated:** Due to chemical sedation, Yes or Nor
    4. **Eye Obstruction:** Yes or No
- **RTS**: Revised Trauma Score is automatically calculated from the admitting Glasgow Coma Score, Systolic Blood Pressure and Respiratory Rate.
- **GCS 40**: **POP OUT** If checked, click on the GCS 40 button, which will display a pop out window with Eye, Verbal, and Motor score utilizing the GCS 40 tool

- **Discharge Status:** Alive or Dead
- **Discharge/Death:** Date in MM/DD/YYY format, and Time in HH:MM
- **Total Days:**
    - **Hospital**
    - **ICU**
    - **Step Down**
    - **Ventilator**
- **Discharge to:** Location of discharge destination. Also includes comments documented by the abstractor about the patient's destination or discharge.
- **Discharge to Facility:** Number and name of facility
- **Reason for Transfer Out:** The primary reason for transfer out. If "Other" selected, text field with abstractor note will show
- **Mode of Transfer Out:** The method of transfer out. If "Other" selected, text field with abstractor note will show

Response Times Tab

- **Called, Arrived, PGY, Provider ID, Phone Consult, Responded, Elapsed Time (EDA to Arrived)**
    - Emergency Medicine Physician
    - Emergency Medicine Resident
    - Attending Trauma Surgeon
    - Senior Trauma Resident
    - Junior Trauma Resident
    - Attending Neurosurgeon
    - Neurosurgical Resident
    - Attending Orthopaedic Surgeon
    - Orthopaedic Resident
    - Attending Anesthesiologist
    - Anesthesiology Resident
    - CRNA
    - Others Called to ED: as entered into the trauma Registry

Procedures Tab

- **Procedures:** A complete list of procedures including the location (i.e., ED, ICU, or OR procedures), date, time, Operation number, ICD-10 code, and description, and performing service and Provider ID.
- **Was intravenous antibiotic therapy administered within 24 hours after the first hospital encounter:** Yes or No
- **Antibiotic Therapy Administered:** Date in MM/DD/YYY format, and Time in HH:MM
- **Massive Transfusion Protocol:**
  - **MTP Initiated:** Yes or No, from COLLECTOR
  - **Location:** Department or setting the MTP was initiated. This field needs completed in Pa v5 Outcomes. Record ED, OR, ICU, etc.
  - **Initiated:** When the MTP was ordered or activated. This field needs completed in Pa v5 Outcomes. Record date in MM/DD/YYY format, and time in HH:MM
  - **Administered:** Timing of when the first blood products were started for MTP. This field needs completed in Pa v5 Outcomes. Record date in MM/DD/YYY format, and time in HH:MM
- **Blood Product Transfusion (within first 4 hours after ED/hospital arrival):** Volume (CCs/mLs)
  - **Packed Red Blood Cells**
  - **Whole Blood**
  - **Plasma**
  - **Platelets**
  - **Cryoprecipitate**

Note: Records prior to 2020 will have recorded

- *Volume, Measurement, Conversion for PRBC, Plasma, Platelets, Cryoprecipitate*
  All fields only collected if patient received PRBC within first 4 hours

Diagnosis Tab

- **Anatomical Diagnoses**: See PTOS Manual for further explanation.
- **AIS Version:** AIS 2005 (Current version in use)
- **ISS**: Injury Severity Score (ISS) is automatically calculated in the Trauma Registry if diagnosis codes are entered.
- **TRISS**: combines RTS, ISS, patient age and type of injury (blunt or penetrating) to calculate P(s).
- **Burn:** Total Burn Surface Area calculations based on diagnoses entered into the trauma Registry.
  - **2nd**
  - **3rd**
  - **Total**
  - **P(s)**
  - **Alt P(s)**
- **Narrative:** The abstractors text of the patient's diagnosis imported from the trauma Registry. May need to scroll down to see the full list
- **ICD-10**: Injury diagnosis code assigned. ICD-10-CM is based on the International Classification of Diseases, which is published by the World Health Organization (WHO) and which uses unique alphanumeric codes to identify injury. The code and description are displayed
- **PREDOT**: The Abbreviated Injury Scale (AIS) code for the injury diagnosis
- **AIS Severity:** Abbreviated Injury Scale (AIS) assigns the severity of each injury code. A minor injury is assigned 1, highest severity is 6, which is considered Maximal (currently untreatable).
- **ISS Body Region:** Injury Severity Score Body Region indicates the ISS location of injury (1-6), not the AIS body regions (1-9).

Section 2 – PIPS Tab

Data in this section is geared toward the Performance Improvement aspect of a trauma program. It assists in systematically documenting the PI activities in the performance improvement process.

There are two tabs within the PIPS tab: The Objective Summary and Identified Events tab and the Outcomes Module tab. Each include multiple sub-tabs.

Objective Summary and Identified Events Tab

Identified Events/Outliers Subtab

List of events identified in the Trauma Registry. The list displays all hospital events, PTSF audit filters, and pre-existing conditions. Each event includes the occurrence date as entered in the Trauma Registry, and if the event has been triggered in the Tracked Events section in the Outcomes Module tab. A trigger status of *Yes* is included in the tracked events, and a trigger status of *No* is not included in the tracked events. Deaths are the only event from the Trauma Registry that creates a tracked event without requiring you to trigger it.

Clicking the **[Auto Trigger]** button results in a pop out window that displays all the events triggered by the Trauma Registry. Click on the checkboxes of each item you want added to the tracked events section and selecting [**OK**]. Not all events auto triggered from the Trauma Registry require review through the PI process. For example, pre-existing conditions do not require being triggered into the tracked events. Deaths, Hospital Events and Audit Filters should be triggered into the tracked events and taken through the PI process.

Patient Info and Prehospital Subtab

A narrative of the patient's information and prehospital phase of care automatically generated from the Trauma Registry data. The narratives can be copied for use within other sections of Pa v5 Outcomes, or other documents.

ED/Resus Subtab

A narrative of ED/resuscitative phase of care, ED procedures and consults automatically generated from the Trauma Registry data. The narratives can be copied for use within other sections of Pa v5 Outcomes, or other documents.

ICU/OR Subtab

A narrative of ICU procedures, Step-Down procedures and OR procedures automatically generated from the Trauma Registry data. The narratives can be copied for use within other sections of Pa v5 Outcomes, or other documents.

Floor-Ward/Discharge Subtab

A narrative of Floor-Ward procedures, other procedures and discharge automatically generated from the Trauma Registry data. The narratives can be copied for use within other sections of Pa v5 Outcomes, or other documents.

Outcomes Module Tab

Case Management Sub-tab

In this section you will document case management information. You can run a spell check for the memo fields by either selecting it in a dropdown menu under Record, or via F7.

- **Flag Record:** This allows users to track, identify, and/or target cases currently being worked on. The 'Flag Record' field was implemented with a user defined menu that will hold up to nine unique menu choices or types of flags. The following generic menu choices were added as a starting point. These menu choices can be changed/edited by in the user Admin module to meet the needs at each facility. Instructions on editing the menu options is in the Pa v5 Outcomes Registry Users Guide available on the PTSF Central Site Portal Support section.
    - 1, Follow-Up
    - 2, Re-evaluation
    - 3, For Next Review

- **Case Summary:** This field is automatically pre-filled with scripted data provided by the Trauma Registry. This information can be edited and will remain when you run the Collector interface. Clicking the **[Case Summary]** button will enlarge the memo field in a pop out window with increased text size. Clicking the **[Generate]** button will regenerate/reset the case summary from the Trauma Registry. Manual edits will be removed. A pop out window will remind you that regenerating the case summary will override the manual edits and require confirmation to prevent accidental edits.

- **Case Management:** This section can be used to enter daily hospital notes for day-to-day case management of the patient. Clicking on the **[Case Management]** button will enlarge the comment box in a pop out window with increased text size. Within this pop out window, you can run a spell check (in a dropdown menu under Record, or via F7).
    1. Notes could be formatted as follows:
        Date – Location in Hospital – Comments.
    2. For example:
        01/15/14 – ICU – pulmonary consult

- **Objective Summary:** Clicking the **[Generate]** button will create a document outside of Pa v5 Outcomes that can be saved or printed for use. The document will include a summary of information from the Patient Info and Prehospital sub-tab, ED/Resus sub-tab, ICU/OR subtab, and Floor-Ward/Discharge subtab from the Objective Summary and Identified Events tab.

- **Case Printout:** Clicking the **[Generate]** button will create a document outside of Pa v5 Outcomes that can be saved or printed for use. The document includes information from the sub-tabs within the Outcomes Module tab.

Meetings Sub-tab

This section is the preferred location for documenting all pertinent meeting notes and discussion, as well as attaching documents to this PI record. The Meetings section can record up to ten separate meeting discussions per patient to document a meeting click the **[Add]** button. This will result in a pop out window with the following fields.

- **Meeting Type:** Choose the type of meeting from the menu options.
    14. Trauma Morbidity and Mortality
    15. Trauma Multidisciplinary Peer Review
    16. Trauma Conference
    17. Trauma Systems Committee
    18. Hospital Quality PIPS Committee
    19. Medical Staff Peer Review
    20. Other Department M and M
    21. Grand Rounds
    22. External Review
    23. Other

- **Meeting Name:** Enter/Select the title of the meeting from the menu. The meeting name menu is initially blank and needs to be customized to be specific to your hospital. Edit via the Admin module, details for instructions in the Pa v5 Outcomes Registry Users Guide available on the PTSF Central Site Portal Support section.

- **Meeting Date:** Enter the date of the meeting/review by month, day and year. When you enter a t in the date field, the field will auto fill with the current date.

- **Related Issues:** The name of a tracked event will be displayed here if you have linked the specific tracked event. To link a meeting, you must go to the specific tracked event window and place the meeting name and date into the Meetings/Reviewed By section. It will then automatically link into the meeting section. A tracked event can be linked to more than one meeting.

- **Attendees:** Enter the attendees for the specific meeting. Click the **[Attendees]** button to pop out an enlarged memo field. The committee members can be entered as the default list for the Attendee section. To create a default list with the current names in the Attendees section click the **[Set Default]** button. To populate the Attendees section with the previously set default committee member click the **[Load Default]** button. If you would prefer to track attendees via paper sign in sheets, indicate this by entering “Please see attendance sheet” in the Attendees Section.

- **Discussion:** Enter in the proceedings of the meeting, including pertinent findings regarding issues surrounding the case. Information should reflect a robust discussion of the participants and the conclusions made with respect to categorization of the determination and acceptability status. If Pre-Existing Conditions (PEC’s) played a role in the care of the patient, they can be mentioned here after the other issues have been identified and addressed. This data, along with the factors, should be included in the discussion and used to arrive at a determination status. Click the **[Discussion]** button to pop out an enlarged memo field.
  The Tertiary Review Meeting process should involve identification of all injuries, and the severity whether or not standards of care were followed, whether or not there was provider error; and for deaths – what was the probability of survival based on TRISS methodology. It is imperative that when

considering this process, all factors, i.e. error in management, error in technique, delayed diagnoses, missed diagnoses, deviation from protocol, deviation from standard of care, equipment failure, mortality – anatomical diagnoses, mortality – survival probability and pre-existing conditions are evaluated.
Based on this process, decisions should be made on all deaths, hospital events, UDI and OFI as to their determination. That is – was the event believed to be an Unanticipated Event with Opportunity for Improvement, Event with Opportunity for Improvement, Event without Opportunity for Improvement or Undetermined Opportunity for Improvement. Unanticipated Event with Opportunity for Improvement and Event with Opportunity for Improvement will require outcome results and resolution. Patients who have withdrawal of support will be included in the analysis of determination. In such cases, the care of the patient up until the time that support was withdrawn should be evaluated as to whether or not standard protocols were followed and whether provision of care was appropriate. These factors, along with the analysis of injury and TRISS methodology, will then be used to assign determination.

- **Template Letter:** If you would like to generate the meeting notes using one of Pa v5 Outcome's templates, select the folder icon. A menu will display all of the meeting template files (if the template files are not displayed, refer to the Pa v5 Outcomes User Guide for details in accessing template files). Choose the file named SampleRequestForReviewIncludingMeeting.doc. Click the **[Generate]** button to open the document outside Pa v5 Outcomes.

The Related Documents section allows you to attachment of up to 20 external documents.

- If you would like to save a Word document, a PowerPoint presentation, or a scanned document, emails etc., you can do so by using this section. It is suggested to attach documents related PI activities such as email exchanges, reviews by others, corrective action material and evidence of completion, and charts and graphs used for tracking data. Attaching these documents will be helpful in locating them when preparing PI folders for site survey. These documents can be printed and included in the PI folders for the site surveyors.
  - Note for attachments: when printing the PI record, the attached documents do not automatically print, they must be opened and printed individually. The attached documents also do not transmit to the central site; only the title of the attached documents is transmitted to the central site.

- To attach a document, click the **[New Link]** button and in the pop out window click the folder icon to select a file from your computer. You can browse to where you have your document saved and open the file you want to save. When you want to retrieve the document, click the **[Open Link]** to open the document that you have saved.

Tracked Events Sub-tab

This section is where event information and all PI activities for the event are documented. Event information is repeatable for up to 20 events per patient. Events can be manually entered or auto filled when triggered from the PTOS Trauma Registry Interface. Deaths are automatically auto filled from COLLECTOR. Events are defined as Opportunities for Improvement (OFI), User Defined Issues (UDI), Hospital Events, Process/System Issues, Pre-Existing Conditions and Deaths.

UDI titles for the Event Menu need to be added via the Admin module. Instructions for how to add UDI titles are in the Pa v5 Outcomes Registry Users Guide available on the PTSF Central Site Portal Support section.

If the trauma program chooses to track complains with protocols, or other center specific quality initiatives in the tracked events section, select the appropriate OFI or UDI and indicate *"No factors identified"* in the Factors section and notate if compliant or non-compliant in the Comments Field. If the protocol was deemed compliant, can then indicate: *"No action items taken"* in the Action Section and *"Not Applicable"* in the Loop Closure Status. This will assist your Trauma Program in identifying that the tracked event is for tracking purposes, and during the site survey it will assist the PTSF Surveyors to identify issues vs. non-issues when reviewing for Performance Improvement related issues.

Each row on this screen will address one issue/event. On this screen, to enter a new tracked event click the **[Add]** button and the tracked event pop out window will be displayed. To edit a previously entered tracked event either highlight the row and click the **[Edit]** button to display the pop out window for the specific event, or double click on the row. To delete a previously entered tracked event highlight the row and click the **[Delete]** button and answer the question in the pop out box to confirm deletion. To add the events triggered from the Trauma Registry click the **[Auto Trigger]** button and check the boxes for each event that should have its own Event Information window.

Each tracked event window includes 2 tabs, the Assessment/Review tab, and the Actions/Loop Closure tab. Details of the PI activities for this event will be documented within these 2 tabs.

The **[Copy]** button allows for copying the current tracked event in its entirety. In a new tracked event, the **[Paste]** button allows for pasting an entire tracked event that has been copied. This ability allows for efficient and timely PI data entry into the software when multiple events are similar. This ability also allows for tracking the details under multiple event titles.

Taxonomy

~~The Taxonomy checkbox allows for the option of including additional fields in the tracked event. The Taxonomy checkbox is automatically checked in Death events. Checking the Taxonomy checkbox opens the following fields for entry: the domain phase of care, the domain target/goals of care, type, the actions prevention/mitigation, and the actions scope. These become required fields that are transmitted to the Outcomes Central Site when submitting patient records that have resulted in death.~~

Taxonomy for the Pennsylvania Trauma Outcomes Study (PTOS) consists of the following sub-categories:

Minimum PI Classification Elements:

required elements for all tracked events
- Dates: Occurrence & Identified Dates

Source of Information
Domain: Setting/Location
- Domain: Service/Staff
- Impact: Physical
- Impact: Psychological

Factors
- Meetings Reviewed By
- Meetings Reviewed Level
- Meetings Reviewed Date
- Determination
- Acceptability
- Corrective Action
- Corrective Action Status
- Corrective Action Completed

Additional PI Elements:

required additional elements for Death Event (9999 Death) and may be used (by checking box) for any/all other tracked events per facility PIPS plan.
Domain: Phase of Care
Domain: Target/Goal of Care
Impact: Social
Impact: Economic
Impact: Legal
Type
Prevention/Mitigation
Scope

Full PI Classification Elements:

Minimum PI Classification + Additional PI Elements; Full PI Classification is required for Death Event (9999 Death) and may be used (by checking box) for any/all other tracked events per facility PIPS plan.

At the bottom of the window, displayed on both tabs, there are a few action buttons:

- **Check** – Clicking on this button will run a check/validation process on all tracked events to ensure all required elements are completed and data entered is validated. See the Pa v5 Outcomes Registry User Guide for details.
- **OK** – Clicking on this button will save and close the Event Information window.
- **Cancel** – Clicking on this button will close the Event Information window without saving. A warning pop up will require the user to confirm cancellation if information in the window was edited.
-  - Clicking on this button will add a new tracked event. This allows the user to add a new event without closing the Event Information window.
-  - Clicking on this button will delete the displayed tracked event. A warning pop up will require the user to confirm deletion of the current event.
-  - Clicking on this button will take the user to the first tracked event. A warning pop up will require the user to confirm if edits to the displayed event should be changed prior to changing events.
-  - Clicking on this button will take the user to the previous tracked event. A warning pop up will require the user to confirm if edits to the displayed event should be changed prior to changing events.
-  - Clicking on this button will take the user to the next tracked event. A warning pop up will require the user to confirm if edits to the displayed event should be changed prior to changing events.
-  - Clicking on this button will take the user to the last tracked event. A warning pop up will require the user to confirm if edits to the displayed event should be changed prior to changing events.

Event Information Window – Assessment/Review Tab

The Assessment/Review tab is dedicated to the recording of the review and analysis steps in the PI process. Enter the identified event and domain during the event identification step. Complete the review and drilldown of this specific event. The comment field can be utilized to document details of the drilldown of this review. Following review of the event complete the analysis by recording and assigning the factors that contributed to this specific event and the level of impact this event had on the patient.

- **Event:** The title of the specific event to track and collect detailed information about. When entering a new tracked event, select the most appropriate event title from the menu box. The menu options include Hospital Events, Process/System Issues, Opportunities for Improvement, Pre-Existing Conditions, User Defined Issues, and Death. Hospital Events, Process/System Issues and Death should be triggered by the Interface with the Trauma Registry. If you need to add a Hospital Event, Process/System Issue or Death that did not trigger from the Trauma Registry it is recommended to enter directly into the Trauma Registry first to ensure capture in the Registry. Process/System Issues in Pa v5 Outcomes is equivalent to Audit Filters in the Trauma Registry.
  The menu options and definitions are listed in **Appendix A**.

- **Occurrence Date:** The date the event took place (occurred) in MM/DD/YYYY format.

- **Identified Date:** Record the date (mm/dd/yyyy) that the issue was identified by the PI program. For hospital events identified in COLLECTOR, this date will be automatically brought over by the trauma registry interface.

- **Source of Information:** Select from the menu box the option that most appropriately describes how/who identified the event.
  Menu Options:
  1, Case Manager
  2, Practitioner
  3, Referrals (written/verbal, emails, hotline)
  4, Identified Post-Discharge
  5, Risk Management Reports
  6, EMS (ground/air)
  7, Transfer Center
  8, AM Report
  10, Patient Rounds
  11, Concurrent Abstraction (registry)
  12, Concurrent Review (TPM, PIC)
  13, Conferences (peer review quality conference, education conferences)
  14, Autopsies
  15, Hospital Quality Management Department
  16, Patient/Family Feedback
  17, Registry Data
  18, Department Reports
  9, Other
  /, Not Applicable
  ?, Unknown

- **Hospital Incidence ID:** Can enter the hospital incidence number if applicable.

- **Domain:** The Domain section of the Event Information screen captures information about the characteristics surrounding the event.

  - **Setting/Location -** The location where the event occurred. Only 1 location is required but users can select up to 2 locations for a single event. The 2nd location response box can be left blank if non-applicable.

    Enter 2 locations in situations that include more than 1 location type. For example, the event occurs while a patient is being transported from 1 location to another, therefore both locations would be entered. Another example is an event that occurs during portable radiology within a patient care department, therefore Radiology and the patient care department are both entered. The setting/location is included in PI events to allow for the trauma program to track through reports the setting/location where events occur to determine if there are trends that need to be addressed.
    Menu Options:
    2, ED
    3, OR
    4, ICU
    6, Med/Surge Floor
    5, Step Down Unit
    10, Radiology
    18, Nuclear Medicine
    9, Burn Unit
    19, PMR
    20, Minor Surgery Unit
    11, PACU
    47, Postmortem
    90, EMS (optional)
    91, Referring Facility (optional)
    12, Special Procedure Unit
    21, Angiography

22, Pediatric Unit (in-house)
/, Not Applicable
?, Unknown

- **Service/Staff** - The hospital resource (service or staff) who was active and/or responsible for the event when it occurred. Only 1 service/staff is required but users are able to select up to 2 instances of Service/Staff for a single event. The 2nd service/staff response box can be left blank if non-applicable. The service/staff is included in PI events to allow for the trauma program to track the service ad staff that are involved in events to determine if there are trends that need to be addressed.

  Menu Options:

1, Trauma	21, GI	41, Physiatry
2, Neurosurgery	22, Home Health	42, Physical Therapy
3, Orthopedics	23, Hospitalist	43, Plastic Surgery
4, General Surgery	24, Infectious Disease	44, Psychiatry
5, Pediatric Surgery	25, Internal Medicine	45, Pulmonary
6, Cardiothoracic Surgery	26, Laboratory	46, Radiology
7, Burn Services	27, Nephrology	47, Rehab
8, Emergency Medicine	28, Neurology	48, Respiratory Therapist
9, Pediatrics	29, Nurse Practitioner	49, Social Services
10, Anesthesiology	30, Nursing	50, Social Worker
11, Cardiology	31, Nutrition	51, Speech Therapy
12, Chaplain	32, Ob-Gyn	52, Thoracic Surgery
13, Child Protective Team	33, Occupational Therapy	53, Trauma Resus Nurse
14, Critical Care	34, Oncology	54, Triage Nurse
15, Discharge Planner	35, Ophthalmology	55, Vascular Surgery
16, Documentation Recorder	36, Oral Surgery	98, Other Surgical
17, Drug/Alcohol Counselor	37, Oromaxillo Facial Service	99, Other Non-Surgical
18, EMT	38, Ortho-Spine	/, Not Applicable
19, ENT	39, Palliative Care	?, Unknown
20, Family Medicine	40, Pharmacy	

- **Phase of Care -** The period of time or stage along the continuum of care in which the event occurred. This field is available for a response when the Taxonomy checkbox is checked.

  Menu Options:

1, Evaluation	2, Resuscitation	3, Operative
4, Critical Care	5, Recovery	6, Rehabilitation
/, Not Applicable	?, Unknown	

- **Target/Goal of Care** - The result (target or goal) toward which treatment and care efforts were focused when the event occurred. This field is available for a response when the Taxonomy checkbox is checked.

  Menu Options:

1, Therapeutic	2, Diagnostic	3, Rehabilitative
4, Preventative	5, Palliative	6, Research
7, Cosmetic	8, Other	/, Not Applicable
?, Unknown		

- **Related Provider/Practitioner:** This is an optional field that allows for attaching involved provider/practitioners name with the event. Users will be able to select up to 3 providers/practitioners for a single event. The related provider/practitioner field is included in PI events to allow for the trauma

program to track the providers and practitioners involved in events, through reports, to determine if there are trends that need to be addressed. Entering providers/practitioners in tracked events can be utilized for credentialing and performance improvement purposes. Reports can be created in Report Writer with the Provider/Practitioner within a report or as a query. The menu options need to be entered by the trauma program in the v5 Admin Module.

- See the Pa v5 Outcomes Registry Users Guide for details on how to create hospital specific menu options. The trauma program can choose to add all physicians, advanced practitioners, nurses, and EMS agencies into the menu options as desired.

- **Impact:** The Impact section of the Event Information window captures information about the amount of effect this specific issue/event had on the patient. The effect of the event is also referred to as harm to the patient. After completing the review of the tracked event, the PI program will indicate the impact to the patient. The impact can be utilized to prioritize (triage) which events to address 1st, 2nd, 3rd, etc. Events with severe level of harm will be prioritized 1st, while events with no harm/no detectable harm will be prioritized last. As the number of tracked events within PA v5 Outcomes will increase over time, the priority order will constantly change.

  The degrees of harm and the definitions:

  No Harm/No Detectable Harm – due to this specific event the patient did not become symptomatic, or no symptoms detected, and no additional treatment was required. For example, a patient received intravenous fluid at a slow rate though it was not ordered. The nurse identifies that there is not an order for the intravenous fluid and discontinues it. This event occurred, reached the patient, but did not harm the patient, nor require additional monitoring or treatment.

  Minimal – due to this specific event the patient became symptomatic, symptoms are mild, loss of function or harm is minimal or intermediate but short term, and no or minimal intervention (e.g., extra observation, investigation, review, or minor treatment) is required.

  For example, during surgery the patient's bowel is nicked with the scalpel. This is immediately identified, repaired and the surgery is completed without further incidence. Prophylactic antibiotics ordered due to this event. The patient's course of care unchanged. The event occurred, reached the patient, required short term additional intervention, but did not result in poor patient outcome.

  Moderate – due to this specific event the patient became symptomatic, requiring intervention (e.g., additional operative procedure; additional therapeutic treatment), an increased length of stay, or causing permanent or long-term harm or loss of function.

  For example, during surgery the patient's bowel is nicked with the scalpel. It is not identified during surgery. Post-operatively the patient develops septicemia and requires return to the OR to repair the perforation. The event reached the patient, resulted in a decline in the patient's condition, requires an intervention, additional monitoring, treatment, and possible increased hospital length of stay.

  Severe – due to this specific event the patient became symptomatic, requiring life-saving intervention or major surgical/medical intervention, shortening life expectancy, or causing major permanent or long-term harm or loss of function. Due to the possibility of a repeat occurrence, resulting in another Severe impact, events/issues assigned a severe impact must be prioritized by the PI program.

  For example, during surgery the patient's bowel is perforated, requiring temporary colostomy and subsequent major surgeries and readmissions. The event reached the

patient and resulted in a decline in patient's condition, required multiple interventions, additional monitoring, treatment, increased hospital length of stay, and additional hospital admissions.

Death – on balance of probabilities, death was caused or brought forward in the short term by this specific event.

For example, during surgery the patient's bowel is perforated resulting in exsanguination. Efforts at resuscitation are unsuccessful and the patient dies. The event reached the patient and directly resulted in the patient's death.

Note that in patients that died, each tracked events should not have Death listed as the impact. Determine the impact of each tracked event on the patient. There may be tracked events that did not change the course of the patient's condition and care (none or minimal impact). In contrast, there may be tracked events that directly resulted in the patient's death, and these tracked events should have Death listed in the impact section.

The extent of harm and the definitions:

Temporary – harm that eventually resolves and does not become permanent
Permanent – irreversible harm

- **Physical –** The tangible or actual (physical) outcome or effects of this specific event to the patient. Related to the Degree of Harm.
  Menu Options & Definitions:
  1, No Harm
  Sufficient information to determine that no physical harm occurred due to this event
  2, No Detectable Harm
  Insufficient information to determine any physician harm due to this event
  3, Minimal-Temporary Harm
  This event resulted in little or no intervention
  4, Minimal-Permanent Harm
  This event resulted in initial but not prolonged intervention
  5, Moderate-Temporary Harm
  This event resulted in prolonged intervention but not prolonged hospitalization
  6, Moderate-Permanent Harm
  This event resulted in intensive intervention and potentially prolonged hospitalization
  7, Severe-Temporary Harm
  This event resulted in intervention necessary to sustain life and potentially prolonged hospitalization
  8, Severe-Permanent Harm
  This event resulted in intervention necessary to sustain life and prolonged hospitalization, long-term care, or hospice
  9, Death
  Sufficient information to support that this event resulted in patient's death

- **Psychological** – The mental or emotional (psychological) outcome or effects of this specific event to the patient. Related to the Degree of Harm.
  Menu Options & Definitions:
  1, No Harm

Sufficient information to determine that this event did not result in psychological harm

2, No Detectable Harm

Insufficient information to determine if this event resulted in psychological harm

3, Minimal-Temporary Harm

This event resulted in little or no intervention

4, Minimal-Permanent Harm

This event resulted in initial but not prolonged intervention

5, Moderate-Temporary Harm

This event resulted in prolonged intervention but not prolonged hospitalization

6, Moderate-Permanent Harm

This event resulted in intensive intervention and potentially prolonged hospitalization

7, Severe-Temporary Harm

This event resulted in intervention necessary to sustain life and potentially prolonged hospitalization

8, Severe-Permanent Harm

This event resulted in intervention necessary to sustain life and prolonged hospitalization, or long-term care

9, Profound Mental Harm

This event resulted in significant and profound patient distress that interferes with the patient's functional ability or quality of life

- **Social** - The relational (social) outcome or effects of this specific event to the patient. Related to the Degree of Harm.
  Menu Options:

  1, Unable to Socialize
  2, Homebound, Able to Socialize
  3, No Social Impediments, Not Socially Active
  4, Socially Active
  /, Not Applicable
  ?, Unknown

- **Economic** - The financial (economic) outcome or effects of this specific event to the patient. Related to the Degree of Harm.
  Menu Options:

  1, Employed
  2, Seeking Employment
  3, Part-Time Employment
  4, Unemployed
  5, Not Employable
  /, Not Applicable
  ?, Unknown

- **Legal -** The lawful (legal) outcome or effects of the event to the patient. Related to the Degree of Harm.
  Menu Options:

  1, Referred to Risk Management
  2, Complaint Registered
  3, Referred to Legal Department
  /, Not Applicable
  ?, Unknown

- **Type:** The implied or visible processes that were faulty, or failed, that contributed to this specific event occurring. Users can select up to 10 types for a single event.
  Menu Options:

  Communication

  TC001, Inaccurate & Incomplete Information
  TC002, Questionable Advice or Interpretation

TC003, Questionable Consent Process
TC004, Questionable Disclosure Process
TC005, Questionable Documentation

Patient Management

TPM01, Questionable Delegation
TPM02, Questionable Patient Care Tracking/Follow-up
TPM03, Questionable Referral or Consultation
TPM04, Questionable Use of Resources
TPM05, Airway
TPM06, Breathing
TPM07, Circulation
TPM08, Neurologic
TPM09, Pulmonary
TPM10, Gastrointestinal
TPM11, Nutritional
TPM12, Urologic
TPM13, Orthopedic
TPM14, Resuscitation
TPM15, Wound Care
TPM16, Intensive Care
TPM17, General Ward Care
TPM18, Rehabilitative Care

Clinical Performance

TCA01, Pre-Interventional – Correct Diagnosis Questionable Intervention
TCA02, Pre-Interventional – Inaccurate Diagnosis
TCA03, Pre-Interventional – Incomplete Diagnosis
TCA04, Pre-Interventional – Questionable Diagnosis
TCB01, Interventional – Correct Procedure with Complications
TCB02, Interventional – Correct Procedure – Incorrectly Performed
TCB03, Interventional – Correct Procedure but Untimely
TCB04, Interventional – Omission of Essential Procedure
TCB05, Interventional – Procedure Contraindicated
TCB06, Interventional – Procedure Not Indicated
TCB07, Interventional – Questionable Procedure
TCB08, Interventional – Wrong Patient
TCC01, Post Interventional – Correct Prognosis
TCC02, Post Interventional – Inaccurate Prognosis
TCC03, Post Interventional – Incomplete Prognosis
TCC04, Post Interventional – Questionable Prognosis

/, Not Applicable
?, Unknown

- **Factors:** The Factors section of the Event Information window captures information related to the cause and agents that led to an incident or event. Users can select up to 10 factors for a single event. During the analysis phase of the PI process, the PI program will identify the factors that contributed to the event. Select the most appropriate factors from the menu. Details of the factors should be documented in the Comment field. The factors identified will assist in determining if there are opportunities for improvement and the most appropriate corrective actions to address this event. In addition, the trauma program can track, through reports, the factors involved in events to determine if there are trends that need to be addressed. Definitions of Human-Practitioner factors in Appendix B.

Menu Options:

System

- FSSP05, Bed Availability
- FSOC01, Chain of Command
- FSOC03, Communication Channels
- FSOC05, Culture of Safety
- FSSP02, Delay in Consulting Provider
- FSSP03, Delays in Provider Response
- FSOC02, Delegation of Authority and Responsibility
- FSSP01, Diversion
- FSOPB03, Documentation
- FSOPC02, Establishment and Use of Safety Programs
- FSTE05, Equipment/Materials Availability
- FSTE02, Equipment/Materials Construction
- FSTE01, Equipment/Materials Design
- FSTE03. Equipment/Materials Malfunction
- FSTE04, Equipment/Materials Obsolescence
- FSOC04, Formal Accountability
- FSOPA02, Incentive Systems
- FSOPB04, Instructions about Procedures
- FSOM01, Maintenance of Organizational Resources
- FSOM02, Monetary Safety Budgets
- FSOPB02, Objectives
- FSSP04, OR Availability
- FSOX01, Organization Failures Beyond Organization Control/Responsibility
- FSOPB01, Performance Standards
- FSOPC01, Risk Management
- FSOPA03, Schedules
- FSOK01, Supervision
- FSOC06, Trauma Center Regulatory Criteria/Standards
- FSTX01, Technical Failures Beyond Organization Control/Responsibility
- FSOPA01, Time Pressures
- FSOK02, Training

Human-Practitioner

- FHC01, Skill Based
- FHS02, Rule-Based
- FHC03, Knowledge-Based
- FHC04, Unclassifiable
- FHC05, Negligence
- FHC06, Recklessness
- FHC07, Intentional Rule Violations

Human – Patient

- FHP01, DNR (Do Not Resuscitate)
- FHP02, DOA (Dead on Arrival) or DOS (Death on Scene)
- FHP03, Survival Probability
- FHP04, Withdrawal of Life Support
- FHP05, Co-Morbidity
- FHP06, Disease Related
- FHP07, Other Pre-Existing Condition
- FHP08, Patient Behavior or Refusal

Human – External

- FHX01, External

/, Not Applicable
?, Unknown

- **Comments:** This area ~~may be used to further~~ is where the PI program will document the details that describe this event and drilldown for this event. Each tracked event has its own comments field in the Assessment/Review tab. Click the **[Comments]** button to pop out an enlarged memo field. Comments entered in this field are not transmitted to the Outcomes Central Site when submitting records.
    - To ensure consistency in documenting the review and analysis steps of the PI process, the trauma program can create review templates that are kept in an electronic document outside of PaV5 Outcomes software that can be copied and pasted into the Comments field to allow ease/consistency of review. The review template for each event type can include relevant questions that are answered during the review.

Event Information Window – Actions/Loop Closure Tab

The Actions/Loop Closure tab is dedicated to the recording of the categorization, action, and re-evaluation steps in the PI process. The Event title, Occurrence date, Identified Date, Source of Information and Hospital Incidence ID from the previous tab is displayed on the top of this tab. Record the meetings and each level of review as well as the categorizations assigned for this specific event. Following categorizing the event develop an action plan, record the action plan and the progress of the action plan in the Action section. Finally, re-evaluate the effects of the corrective actions and determine if the loop has closed for this specific event. The action details field can be utilized to document details of the actions, metrics to demonstrate resolution and re-evaluation to determine if the actions resolved the issue/event to prevent this specific event from happening again to future patients.

The **[Add Reminder to Calendar]** button will open a new calendar appointment referring to this specific tracked event that can be added to your calendar. The reminders should be utilized to remind you when to follow-up on reviews by other people, follow-up on action plan completion, and/or re-evaluate to determine if the loop has been closed.

- **Meetings/Reviewed by**: The forum (meeting) where the event was discussed and/or the assembly of people (reviewed by) who discussed the event. Select the appropriate meetings that this case was discussed. This field can accommodate 10 different meetings. When this field is selected, it will auto-fill the "Related Issues" in the Meeting Section
  Menu Options:

1, Trauma PI/QA Coordinator	2, Trauma Program Manager/Coordinator
3, Trauma Registrar	4, Case Manager
5, Physician Extender/PA/NP/CNS	6, Emergency Department
7, Trauma Medical Director/Designee	8, MD Specialty Liaison
9, Department Head	10, Risk Management
11, Pre-Hospital Review	12, Transferred from Facility
13, Transferred to Facility	14, Trauma Morbidity and Mortality
15, Trauma Multidisciplinary Peer Review	16, Trauma Conference
17, Trauma Systems Committee	18, Hospital Quality PIPS Committee
19, Medical Staff Peer Review	20, Other Department M&M
21, Grand Rounds	22. External Review
23, Other	/, Not Applicable
?, Unknown	

- **Levels:** The review level of the meeting where the event was discussed. The definition of each level of review is defined by your institution/trauma program in the PI Plan.
  Menu Options:
  1, Primary 2, Secondary 3, Tertiary 4, Quaternary

- **Date:** The date of the meeting where the event was discussed, in format MM/DD/YYYY.

- **Systems:** Identify if the cause and agents that led to the event were related specifically to System factors. The selection should correlate with the factors selected on the previous tab. If the factors are system factors, then the response will be Y=yes. Clicking in the box will display the response:

One Click	Y = yes
Two Clicks	N = no
Three Clicks	n/a = Not Applicable

Four Clicks ? = Unknown
Five Clicks takes you back to Y

- **Providers/Practitioner:** Identify of the cause and agents that led to the event were related specifically to Provider/Practitioner factors. The selection should correlate with the factors selected on the previous tab. If the factors are provider/practitioner factors, then the response will be Y=yes. ~~The values entered in the 'Provider/Team Related In House and Out House' fields on the Issue Evaluation screen in Outcomes v5 are considered in a mapping and displayed~~. Clicking the box will display the response:

  One Click Y = yes
  Two Clicks N = no
  Three Clicks n/a = Not Applicable
  Four Clicks ? = Unknown
  Five Clicks takes you back to Y

- **Patients:** Identify if the cause and agents that led to the event were related specifically to the Patient factors. Record if this specific event was patient related. The selection should correlate with the factors selected on the previous tab. If the factors are patient factors, then the response will be Y=yes. Clicking the box will display

  One Click Y = yes
  Two Clicks N = no
  Three Clicks n/a = Not Applicable
  Four Clicks ? = Unknown
  Five Clicks takes you back to Y

- **Determination:** The status of this specific event and the measurement that best describes the potential for improvement as agreed upon by those involved in review of this specific event. The Determination measures the potential that may have existed in improving the outcome of this specific event for future patients.

  Menu Options & Definitions:

  1, Unanticipated Event with Opportunity for Improvement

  Mortality –(mortality was unanticipated and your center has identified opportunities for improvement. Requires action plan to address those OFI and loop closure.)

  - Anatomic injury or combination of injuries considered survivable
  - Standard protocols not followed with unfavorable consequence
  - Inappropriate provider care with unfavorable consequences
  - P(s) > 0.5 by TRISS methodology

  Other Events – (complication was unanticipated, and your center has identified opportunities for improvement. Requires an action plan and loop closure.)

  - Complication related to deviation from standard protocol
  - Complication result of provider error
  - Complication related to error in judgment
  - Complication related to equipment malfunction

  2, Event with Opportunity for Improvement

  Mortality – (anticipated mortality, but your center has identified opportunities for improvement. Requires an action plan to address those OFI and loop closure.)

  - Anatomic injury or combination of injuries considered severe but survivable under optimal conditions

- Standard protocols not followed, possibly resulting in unfavorable consequence
- Provider related care considered sub-optimal, possibly resulting in unfavorable consequence
- P(s) 0.25 - 0.5 by TRISS methodology

Other Events – (anticipated event, but your center has identified opportunities for improvement. Requires an action plan to address those OFI and loop closure)

- Complication indirectly related to deviation from standard protocol, operator error or error in judgment
- Provider related care considered suboptimal indirectly resulting in unfavorable outcome

3, Event without Opportunity for Improvement (for both mortality events and other events, if you have identified there are no identified opportunities for improvement, that indicates there are no actions that your center would do to change the exact same event from re-occurring. If you would change anything about the process, system, event, or outcome, then it should be recategorized into one of the above categories with an OFI identified)

Mortality -

- Anatomic injury or combination of injuries considered non-survivable with optimal care
- Standard protocols followed or if not followed, did not result in unfavorable consequence
- Provider related care appropriate or if sub-optimal, did not result in unfavorable consequence
- P(s) < 0.25 by TRISS methodology

Other Events -

- Complication occurred despite adherence to a reasonable standard protocol
- Complication occurred despite appropriate care and good judgment

4, Undetermined Opportunity for Improvement
/, Not Applicable
?, Unknown Event Outcome

- **Acceptability:** The measurement of the care provided, and if it was acceptable for this specific event as agreed upon by those involved in review of this specific event.
  Menu Options & Definitions:
  1, Acceptable
  - Care provided as per the trauma center patient management guideline
    E.g., PMG: Patient care followed trauma center's rib fracture management guideline.
    or
  - standard of care.
    E.g., Standard of care: if a peer group of providers were in this situation, the majority would have made the same decision.

  2, Acceptable with Reservations
  - A variance from trauma center patient management guideline
    E.g., Rib Fx PMG specified for an Incentive spirometer to be completed for a rib fractured patient, and it was not done. Did not negatively impact patient care or outcome.
    or

- standard of care that does not negatively impact patient care or outcome.
  E.g., Standard of care: if a peer group of providers were in this situation, there would have been significant division between the care provided. Approx half would have done one thing, and the other half would have done something else.

3, Unacceptable

- A variance from trauma center patient management guideline
  E.g., Rib Fx PMG specified for a follow-up CXR to be completed for a rib fractured patient, and it was not done, and the patient developed hypoxic respiratory failure.
  or
- standard of care that negatively impacts patient care or outcome.
  E.g., Standard of care: if a peer group of providers were in this situation, rarely would one have made the same decision.

/, Not Applicable ?, Unknown

- **Actions:** The Actions section of the Event Information window captures information related to the activities or steps taken to minimize and/or eliminate the event in future patient care. Also captures information related to the closure of the reported event. If the PI program assigned a Determination with opportunities for improvement, then an action plan must be established. Users can select up to 10 actions for a single event.
  - **Corrective Action** - The activities and steps that were taken by clinical staff to mitigate the outcome of an event, or to minimize and/or eliminate the occurrence of the event or its outcomes in the future. Select the most appropriate corrective action from the menu options. Details of the corrective actions will be documented in the Actions Details field.
    Menu Options:

    0, No Action Items Taken
    1, Education Offering
    2, Policy or Practice Guideline: Develop
    3, Policy or Practice Guideline: Revise
    4, Provider or Team Counseling
    5, Improve Resources
    6, Improve Facilities
    7, Improve Communication
    8, Referral to Department Head
    9, External Review
    10, Disciplinary Action
    11, Change in Provider Credentialing
    12, Administrative Action
    13, Suspension or Termination of Provider
    14, Discussion with Individual
    16, Referral to Peer Review committee
    17, Referral to Prehospital
    18, Referral to Physician/Provider
    19, Referral to Trauma Systems Committee
    20, Track and Trend for Further Reporting
    99, Other
    ?, Unknown

  - **Prevention/Mitigation -** The type of measures taken or proposed to reduce incident and effect of adverse occurrences. This field is available for a response when the Taxonomy checkbox is checked. Each corrective action will need a response in this field if applicable.
    Menu Options & Examples:

    1, Prevention
    For example, improving the effectiveness of communication among caregivers, or improving the safety of using infusion pumps.
    2, Mitigation
    For example, reducing the risk of healthcare-acquired infections, or eliminating wrong-side surgery.
    /, Not Applicable
    ?, Unknown

- **Scope -** The range (scope) of the plan being implemented related to the corrective actions to prevent future occurrence of the event. This field is available for a response when the Taxonomy checkbox is checked. Each corrective action will need a response in this field if applicable.
  Menu Options & Examples:
  1, Universal: Action Designed for All Patients
  For example, improving the accuracy of patient identification, or improving the effectiveness of clinical alarm systems are both universal scopes of action because they apply to all patients.
  2, Selective: Action Designed for Patients with Specific Risk of Adverse Event
  For example, eliminate wrong-site or wrong-procedure surgery are both selective scopes of action because they apply to the large subset of patients that are having surgery.
  3, Indicated: Action Designed for High-Risk Patients with Minimal Risk of Adverse Events
  For example, improving the safety of using high-alert medications is an indicated scope of action because it applies to a very small subset of patients that are receiving high-alert medications.
  / Not Applicable
  ? Unknown

- **Status -** The current state (status) of the corrective action being taken. Each corrective action will need a response in this field. Assigning a status allows the PI program to track, through a report or identify in the Search, the actions that require follow-up and update in status.
  Menu Options & Definitions:
  1, Active
  Specific action is currently being implemented.
  2, Pending
  Specific action is planned but has not been implemented yet.
  3, Closed Tagged for Follow-Up
  Specific action was initially implemented by another individual and fellow-up to determine completion of action is required.
  4, Closed
  Specific action implementation is completed.
  / Not Applicable
  ? Unknown

- **Completed -** The date the corrective action was completed in MM/DD/YYYY format. Each corrective action will need a response in this field

- **Action Details:** ~~Record additional comments or pertinent notes about the actions~~ Document details of the action plans and re-evaluation following the action in this field. Clicking the **[Action Details]** button pops out a window of an enlarged memo field. Comments entered in this field are not transmitted to the Outcomes Central Site when submitting records.
  - Details of the action plan should include the established metric (goal) that will be used to demonstrate resolution and should be documented in this field. The metric should be measurable.
  - Data supporting the loop closure status should be documented in this field.

- **Loop Closure Status:** The current state that best describes the status of this specific event's resolution. The loop closure status should be frequently updated, reflecting the progress made toward eventual loop closure.

  Menu Options & Definitions:

  1, Open – Pending Action
  The PIPS process for this event is not complete. An action plan was developed, and the next step is to implement the action plan.

  2, Open – Pending Autopsy
  The PIPS process for this event is not complete. An autopsy report is required prior to completing analysis/review of this event.

  3, Open – Pending Referral
  The PIPS process for this event is not complete. A referral was made for review of this patient record/event, and the next step is to obtain follow-up from the referral.

  4, Open – Pending Other
  The PIPS process for this event is not complete. The next step in the PIPS process is dependent on a reason other than pending an action, autopsy, or referral.

  5, Inactive – No Action Follow-Up
  The PIPS process for this event is not complete and is stalled. The action's responsible party has not provided a follow-up.

  6, Inactive – No Referral Feedback
  The PIPS process for this event is not complete and is stalled. The individual completing the referral has not provided feedback.

  7, Inactive – Other/Not Resolved
  The PIPS process for this event is not complete and is stalled. The reason is other than not receiving follow-up on an action or referral feedback. The event is not resolved and unable to foresee the event being resolved.

  8, Closed – Tagged for Follow-Up
  The PIPS process for this event is not complete. The action plan has been implemented and follow-up is needed to re-evaluate event type for resolution.

  9, Closed – Resolved
  The PIPS process for this event is complete. The action plan was implemented, the event type was re-evaluated, and the re-evaluation demonstrated measurable improvement in the event type. The Trauma Program can confidently say that this type of event is very unlikely to occur again based on the data. Assigning the loop closure status as Closed-Resolved requires documentation of the data that supports loop closure within the Actions Details field.

  /, Not Applicable
  No opportunities for improvement identified, no action plan required, therefore achieving loop closure is not applicable.

  ?, Unknown

- **Loop Closure Date**: The expected completion for the event or the completion date for the event in MM/DD/YYYY format. This field can also be used to remind the user when to re-examine the event and set up follow-up reminders for the event.

Outcome Summary Sub-tab

This section is where the overall summary about the case is documented. It is a summary of all reviews and events and highlighting the overall PI process for this case. Overall outcome results, determinations and resolutions are recorded once per patient case. All deaths require this section to be completed before closing and submitting to central site.

- **Resolution Date:** Enter the date for the resolution of the entire patient case in MM/DD/YYYY format. When you enter a t in the field for the date, the field will automatically fill with the current date.

- **Primary Cause of Issue:** Select the main cause of issues/events in this patient case. If the patient died, select the cause of death, otherwise, select the cause of complications/issues/events**.**
  Menu Options:
  1, Acute MI
  2, Cardiac Tamponade
  3, CNS
  4, Exsanguination
  5, Hypoxia
  6, Organ Failure
  7, PE
  8, Sepsis/infection
  9, Other
  11, Preexisting Condition
  12, Sequelae of injury
  13, Infection due to Treatment
  /, Not Applicable
  ?, Unknown

- **Outcomes Case Resolution Notes:** Enter the final summary of the PI outcomes of the case, summarizing the review, highlighting the PI activities and resolution to events/issues identified. Clicking the **[Outcomes Case Resolution Notes]** button pops out a window of an enlarged memo field.

- **Approval/Sign off:** Once the entire patient case has completed the PI process it can be signed off for approval in this field. This is an optional field and is not required for closing and submitting the record to the Outcomes Central Site.
  Menu Options:
  1, Yes 2, No /, Not Applicable ?, Unknown

- **Overall Action:** Record up to 3 actions that have been taken in this patient's case.
  Menu Options:
  0, No Action Items Taken
  1, Education Offering
  2, Policy or Practice Guideline: Develop
  3, Policy or Practice Guideline: Revise
  4, Provider or Team Counseling
  5, Improve Resources
  6, Improve Facilities
  7, Improve Communication
  8, Referral to Department Head
  9, External Review
  10, Disciplinary Action
  11, Change in Provider Credentialing
  12, Administrative Action
  13, Suspension or Termination of Provider
  14, Discussion with Individual
  16, Referral to Peer Review committee
  17, Referral to Prehospital
  18, Referral to Physician/Provider
  19, Referral to Trauma Systems Committee
  20, Track and Trend for Further Reporting

99, Other ?, Unknown

- **Action Status:** Record the status of each of the actions. Prior to signing off the patient's case the action status should be closed for each of the actions documented in this section.
  Menu Options:
  1, Active 2, Pending 3, Closed Tagged for Follow-Up
  4, Closed /, Not Applicable ?, Unknown

- **Overall Determinations Made:** Record the overall determination of the case. Can record the determination from the 1st review and the determination from the 2nd review.
  Menu Options:
  1, Unanticipated Event with Opportunity for Improvement
  2, Event with Opportunity for Improvement
  3, Event Without Opportunity for Improvement
  4, Undetermined Opportunity for Improvement
  /, Not Applicable
  ?, Unknown Event Outcomes

- **Overall Care:** Record the overall acceptability of the care in this case.
  Menu Options:
  1, Acceptable 2, Acceptable with Reservations
  3, Unacceptable /, Not Applicable ?, Unknown

- **Template Letter:** Notes entered into the Outcomes Summary section can be exported into a template. To create a letter, select the template to be used by clicking on the folder icon and choosing the template from the file manager. Click the **[Generate]** button, which will open the template letter in an external program. See Pa v5 Outcomes User's Guide on how to use templates and add Merge Fields.

Referrals Sub-tab

Referral documents are recorded in this section. Referral correspondences (letter, email, etc.) can be sent to other providers for review, EMS, sending hospital for transfers, autopsy requests, and requests for follow-up from transfers. Up to 10 referrals can be recorded for each case. Each row on this screen will address one referral letter/message. On this screen, to enter a new referral click the **[Add]** button and the referral pop out window will be displayed. To edit a previously entered referral either highlight the row and click the **[Edit]** button to display the pop out window for the specific event, or double click on the row. To delete a previously entered referral highlight the row and click the **[Delete]** button and answer the question in the pop-up box to confirm deletion.

The bottom of the referral pop-up window displays a few action buttons:

- **Check** – Clicking on this button will run a check/validation process on all referrals entered to ensure all required elements are completed and data entered is validated. See the Pa v5 Outcomes Registry User Guide for details.
- **OK** – Clicking on this button will save and close the referral window.
- **Cancel** – Clicking on this button will close the referral window without saving. A warning pop up will require the user to confirm cancellation if information in the window was edited.
-  - Clicking on this button will add a new referral. This allows the user to add a new referral without closing the referral window.
-  - Clicking on this button will delete the displayed referral. A warning pop up will require the user to confirm deletion of the current referral.
-  - Clicking on this button will take the user to the first referral. A warning pop up will require the user to confirm if edits to the displayed referral should be changed prior to changing referrals.
-  - Clicking on this button will take the user to the previous referral. A warning pop up will require the user to confirm if edits to the displayed referral should be changed prior to changing referrals.
-  - Clicking on this button will take the user to the next referral. A warning pop up will require the user to confirm if edits to the displayed referral should be changed prior to changing referrals.
-  - Clicking on this button will take the user to the last referral. A warning pop up will require the user to confirm if edits to the displayed referral should be changed prior to changing referrals.

The referral section uses the Referral Contact list that each institution populates specific to their center. The referral contacts menu is initially blank and needs to be customized. Edit the referral contacts menu is Pa v5 Outcomes via Setup on the menu bar. Highlight Referral Contacts from the dropdown and select Manager. The Referral Contacts Record Manager will be displayed where the user can **[Add]**, **[Edit]**, or **[Delete]** referral contacts. Detailed instructions for creating the referral contact list are available in the Pa v5 Outcomes Registry Users Guide on the PTSF Central Site Portal Support section.

Referral Window

- **Referral Date:** Enter the date the referral was made.

- **Referred to:** Record to whom the referral was made (physician, division, etc.). Clicking the arrow will display the Select Contact pop out window with the list on referral contacts previously entered. You may select from the Select Contact window or type in your own information. Highlight a contact and click the **[Select]** button or double click the contact to add this contact to the referral. If there are a large number of contacts, click the **[Search]** button to search within this window.

- **Salutation:** Enter the salutation for this referral letter, i.e. Dear Dr. Smith. If a contact is selected from the referral contact list the salutation will be populated with the pre-entered information. This salutation will be placed in the referral letter when generated.

- **Telephone:** Enter the phone number of the person to whom the referral correspondence is being sent. This will be automatically filled in if you have selected a referral from the referral contact list.

- **E-mail:** Enter the e-mail of the person to whom the e-mail is being sent. This will be automatically filled if you have selected a referral from your referral contact list.

- **Address:** Enter the address for the person to whom the referral correspondence is being sent. This will be automatically filled in if you have selected a referral from your referral contact list.

- **Related Issues:** Select the issue from the menu related to this referral, i.e., pneumonia, death, etc. Users can select up to 3 issues per referral.

- **Referral Comments:** Record the information regarding the referral that should be included in the body of the letter. This information will be included as part of the scripted letter. Clicking the **[Referral Comments]** button will enlarge the memo field in a pop out window with increased text size.

- **Replied:** Enter in the appropriate response to indicate whether a reply was received.
  Menu Options:
  1, Yes 2, No /, Not Applicable ?, Unknown

- **Reply Date:** Enter the date that a reply was received in MM/DD/YYYY format.

- **Reply Notes:** Enter notes or comments provided back to your institution from this specific referral. Clicking the **[Reply Notes]** button will enlarge the memo field in a pop out window with increased text size.

- **Template Letter:** To create the referral letter/correspondence, click on the folder icon and select the template from the file manager. SampleReferralTemplate.doc can be utilize for referral correspondences. Click the **[Generate]** button to open the document outside Pa v5 Outcomes. When the referral reports are generated, the referral will use the merge template to generate a referral document. Detailed instructions on how to utilize template letters is available in the Pa v5 Outcomes User Guide on the PTSF Central Site Portal Support section.

- **External Letter:** This field allows the user to link an externally saved document or scanned document to the specific referral. The best use is to link an electronic reply to the referral. It can support any external files, i.e., jpeg, .doc, .pdf, etc. Click on the folder icon and select the file that you want linked to this referral. Once a file is attached, clicking the **[Open]** button to open the attached file.

Re-Evaluation Sub-tab

Re-evaluation of the case and reviews, other than your own, can be recorded in this section.

- **Re-evaluation Date:** Enter the date of the re-evaluation in MM/DD/YYYY format.

- **Re-evaluation Memo:** Record the information regarding the re-evaluation of the case, which may indicate significant conclusions, or no significant changes. Clicking the **[Re-Evaluation Notes]** button will enlarge the memo field in a pop out window with increased text size.

- **Other Reviews/Re-Evaluation**: Document reviews completed by other people and committees. Each row in this section will address one review by others. To enter a new review by others, click the **[Add]** button and the Other Review pop out window will be displayed. Users can add up to 3 other reviews/meetings. Users can also **[Edit]** or **[Delete]** previously entered reviews by others.
    - **Committee –** Enter the appropriate committee name/title in which the review took place. This information needs to be typed manually as there is no drop-down menu. Examples include division and departmental M&M meetings: Med-surg, ortho, plastics, etc.
    - **Date –** Enter the date of the review in MM/DD/YYYY format.
    - **Feedback –** Record if feedback has been received from this committee/review.
      Menu Options:
      1, Yes 2, No /, Not Applicable ?, Unknown
    - **Feedback Date-** Enter the date the feedback was obtained in MM/DD/YYYY format.
    - **Notes –** Document the notes received in the feedback from the committee/review. Clicking the **[Notes]** button will enlarge the memo field in a pop out window with increased text size.

Appendix A: Tracked Events Menu & Definitions

Opportunities for Improvement Menu

9001, Airway: Delay in securing
9002, Airway: Reintubation
9003, Airway: Self Extubation
9004, AMA/Elopement
9007, Blood Bank: Availability/Massive Transfusion
9006, Blood Bank: Transfusion issue
9005, Blood Bank: Other Issues
9008, Burn Care Issues
9010, Case Management: Insurance Issue
9009, Case Management: Other
9011, Communication: Interdisciplinary
9012, Communication: Lack of appropriate patient/family communication
9013, Communication: Lack of documentation
9014, Communication: Lack of Social Worker Involvement
9015, Consultant: Delay in Evaluation
9016, Consultant: Delay in Treatment
9017, Delay: Completion of work
9018, Delay: Diagnosis
9019, Delay: Diagnostic studies
9025, Delay: Discharge
9021, Delay: Physical Therapy/Rehabilitation
9022, Delay: Trauma team arrival
9023, Delay: Trauma team notification
9024, Delay: Treatment
9026, DVT/PE Prophylaxis: Inappropriate
9027, Equipment: Failure
9028, Equipment: Unavailable
9029, Fall
9030, Hemorrhage Control
9032, Hypothermia: Inappropriate warming measures
9033, Immobilization: Inappropriate or inadequate
9034, Inappropriate transfer to Floor/ICU
9035, Inappropriate use of CT
9036, Infection: Central Line
9037, Infection: Nosocomial (Other)
9038, Missed Diagnosis
9039, Monitoring: Inappropriate
9040, Nursing: Delay in notification of patient event
9041, Nursing: Documentation issue
9042, Nursing: Medication issue
9044, Nutrition issues
9046, OR Delay: Anesthesia Related
9047, OR Delay: Availability
9045, OR Delay: Other
9050, Organ Procurement Issues
9051, Pain management issues
9053, Pharmacy: Delay in providing necessary medication
9054, Pharmacy: Medication issue
9052, Pharmacy: Other Issues
9055, Physician: Documentation Issue
9058, Post discharge: Infection
9056, Post discharge: Other
9085, Post ED destination inappropriate
9059, Professional Behavior: Inappropriate
9060, Progression of Original Neurological Insult
9061, Radiology Delay: Interventional Radiology
9062, Radiology Interpretation: Delay
9063, Radiology Interpretation: Issue
9064, Radiology Imaging Delay: CT
9065, Radiology Imaging Delay: Plain Film
9066, Readmission: Unplanned
9067, Resuscitation: Lack of Vascular Access
9068, Resuscitation: Over
9069, Resuscitation: Under
9070, Spine Clearance: Delay
9071, Spine Clearance: Protocol Not Followed
9072, Subspecialist: Judgment Issue
9073, Subspecialist: Technical Issue
9074, Subspecialist: Deviation from guidelines/protocols
9077, Transfer Delay: Time Unjustified
9086, Transfer to Higher Level of Care
9080, Trauma Surgeon: Deviation from guidelines/protocols
9078, Trauma Surgeon: Judgment Issue
9081, Trauma Surgeon: Lack of Resident/Advanced Practice Staff Supervision
9079, Trauma Surgeon: Technical Issue
9083, Triage: Over
9084, Triage: Under

Opportunities for Improvement Definitions:

Opportunities for Improvement (OFI's) are a list of common Performance Improvement/Patient Safety (PIPS) terms used to categorize events that impact patient care. The intent is to differentiate issues not already captured in nationally recognized Hospital Events or Audit Filters. The accompanied list of definitions is not to be used as absolutes for qualification, but rather a clarification of terminology. They can be applied at the discretion of the trauma centers regarding issues that have an effect on patient care.

Standardizing these terms will allow for an organized method to collect data across the state trauma system. This will allow data mining for the purposes of identifying factors impacting care within the Commonwealth. The goal is to enhance the care provided to the trauma patient.

Airway: Delay in securing - Failure to recognize the need for airway protection and/or ventilation in a timely manner.

Airway: Reintubation - Securing an airway after prior elective and/or self extubation; any intentional change of an endotracheal tube due to tube malfunction/issue.

Airway: Self Extubation - Patient initiated removal of endotracheal tube regardless if the patient required or did not requiring reintubation.

AMA/Elopement - Patient initiated departure from the hospital prior to ordered discharge, known or unknown by the trauma clinical staff.

Blood Bank: Availability/Massive Transfusion - Delay in processing blood products;

- Availability of universal donor blood products
- Availability of type specific blood products

Blood Bank: Transfusion issue – Issue occurred during transfusion. This could be a blood reaction of any type; Type and cross/compatibility issue; adverse effects including, notification of a provider and ordered treatment; Initiation of a transfusion reaction report.

Blood Bank: Other Issues – Issues with Blood Bank that are not availability or transfusion related. This could be an absence of blood sample for Type & Cross; Error in labeling blood; patient identification issue (mismatch between blood label and patient identification bracelet (trauma pseudo identifier verses real identifier)).

Burn Care Issues - Failure to identify /estimate the burn wound size; Failure to initiate appropriate fluid resuscitation; Delay in identification of burn wound requiring transfer to Burn Trauma Center.

Case Management: Insurance Issue - Absence of documentation reflecting timely notification to treatment team of insurance coverage issues related to length of stay, required post-discharge durable medical equipment, appropriate post discharge level of care, or other services.

Case Management: Other - Absence of documentation demonstrating coordination of care; appropriate discharge planning and follow-up care.

Communication: Interdisciplinary - Absence of written or verbal communication demonstrating collaboration across all disciplines involved in patient's care.

Communication: Lack of appropriate patient/family communication - Absence of written or verbal communication demonstrating timely notification of patient/family regarding care management and/or involvement in discharge planning.

Communication: Lack of documentation - Absence of documentation for events/changes in clinical status that changed the course of treatment.

Communication: Lack of Social Worker Involvement - Absence of social worker documentation.

Consultant: Delay in Evaluation – Consultant completion of consult beyond the time expectation defined by your institution/trauma program.

Consultant: Delay in Treatment - Treatment by consultants initiated beyond the standard of care/best practice.

Delay: Completion of work - Initial evaluation that is not completed in the Trauma Bay; excludes patients who go to the OR due to being in extremis.

Delay: Diagnosis - Diagnosis of injury that occurs after the initial resuscitation phase of care but prior to discharge.

Delay: Diagnostic studies - Delay in ordering or completing diagnostic studies that have been ordered as defined by the institution/trauma program.

Delay: Discharge - Delay in discharge related to: Unclear disposition, psychiatric issues, delay in assessment by rehabilitation, delay in referrals to rehabilitation, physician delay, diagnostic test delay, transportation issue, or insurance reasons.

Delay: Physical Therapy/Rehabilitation - Delay in Physical therapy assessment and/or evaluation.

Delay: Trauma team arrival - Trauma Team arrival beyond the time expectation defined in your Trauma Team Response policy.

Delay: Trauma team notification - Delay in initiating trauma team activation after patient arrival.

Delay: Treatment - Delays in ordered treatment plan (non-life threatening) that do not occur within 24 hours; delays in ordered treatment plan (life threatening) that do not occur within designated time (timeframe outlined in institution/trauma program practice management guidelines or predetermined timeframe).

DVT/PE Prophylaxis: Inappropriate - Chemical or mechanical DVT/PE prophylaxis ordered is not per the institutional/trauma program practice management guidelines; Chemical or mechanical DVT/PE prophylaxis ordered/administered, despite contraindication due to injury.

Equipment: Failure – Test, procedure, or monitoring not done/delayed due to broken or malfunctioning equipment.

Equipment: Unavailable - Test, procedure, or monitoring not done/delayed due to unavailable equipment.

Fall - A patient fall within the hospital that is an unplanned descent to the floor (or extension of the floor, e,g, trash can or other equipment) with or without injury to the patient.

Hemorrhage Control - Control of hemorrhage not achieved, requiring intervention or return to OR for continued bleeding. May include patients who need sutures, staples, or angiography.

Hypothermia: Inappropriate warming measures - Hypothermia documented, warming measures not initiated or measures initiated are not as per institution/trauma program guideline/policy.

Immobilization: Inappropriate or inadequate - Required fracture or spinal immobilization is not initiated or if initiated, not correctly or not the correct equipment: Lacking collar and/or back board; lacking appropriately sized cervical collar; utilization of non-approved spinal immobilization devices; incorrect placement of pelvic binder.

Inappropriate transfer to Floor/ICU –

- *Inappropriate transfer to floor*: patient required ICU level of care and was transferred to floor with or without an order for transfer, and/or transferred to a non-trauma credentialled floor.
- *Inappropriate transfer to ICU*: patient did not require high level monitoring/ICU level of care but was transferred to the ICU, or a trauma patient that required higher level of care was transferred to a non-trauma credentialled ICU.

Inappropriate use of CT – CT imaging was not indicated per institution/trauma program practice management guideline/policy or standard of care/best practice, but was ordered and/or completed. For example: Pan scanning pediatric patient; Pan scanning patient based on mechanism of injury alone vs, scanning based on physical examination and mechanism of injury.

Infection: Central Line - Central Line-Associated Bloodstream Infection (CLABSI) event is defined by the CDC as a laboratory-confirmed bloodstream infection (i,e, significant fungaemia or bacteremia)where an eligible blood stream infection organism is identified with no other apparent source of infection where an eligible central line is present within 48 hours of the event.

Infection: Nosocomial (Other) - Infection acquired during the course of receiving medical care. This would include hospital acquired infections not captured under Hospital Events.

Missed Diagnosis - Inaccurate assessment of patient's injuries and/or inaccurate radiologic reading that lead to the diagnosis after discharge.

Monitoring: Inappropriate - Unstable patient: lacking monitoring when transported to any area.

Nursing: Delay in notification of patient event - Delay to inform and/or respond to a change in patient, status, event, or result.

Nursing: Documentation issue - Documentation that is incomplete, incorrect, missing, or misinformed which results in a documentation error.

Nursing: Medication issue - Deviation from 1 of the 5 core principles in medication administration; documented:

- Correct medication
- Correct patient
- Correct dosage
- Correct route
- Correct time

Nutrition issues – Delay and/or inappropriate enteral feeding post resuscitation or acute operative course (ED to OR) per institutional guidelines: Parental nutrition used in combination with enteral nutrition started at < 8 days; Parental nutrition alone started at < 8 days; Delay in following nutritional recommendations; Delay in initiating ordered nutrition

OR Delay: Anesthesia Related - Anesthesia events resulting in a delay to operative patient care.

OR Delay: Availability - OR room or OR team not available when needed for patient care.

OR Delay: Other - Events resulting in a delay to operative patient care. Including delay in the following: Staffing (exclude anesthesiology); Facility; Scheduling; Therapy; Diagnostic; Equipment; Social (family); Transportation.

Organ Procurement Issues - The hospital failed to call Organ Procurement Organization (OPO); Communication with the family about OPO occurred before the OPO team was present; OPO process or personnel was not efficient.

Pain management issues - Failure to identify pain management needs; Failure to order the appropriate doses; Delay in starting a pain management regime; Adverse event due to lack of pain medication, ex: respiratory compromise

Pharmacy: Delay in providing necessary medication - Delay in access to medications from Pharmacy.

Pharmacy: Medication issue - Pharmacy sent the wrong medication or sent the wrong dose.

Pharmacy: Other Issues - Any delay or incorrect medication that resulted in a "never event" or an actual adverse event.

Physician: Documentation Issue - Documentation that is incomplete, incorrect, missing, or misinformed which results in a documentation error.

Post discharge: Infection - Infection identified $\leq$ 30 days after a previous hospital admission.

Post discharge: Other - Any care related issue identified $\leq$ 30 days after a previous hospital admission.

Post ED destination inappropriate – Admission to level of care that is inappropriate for acuity of patient, inappropriate based on clinical guidelines or trauma, or non-trauma credentialled floor. Decision to transfer/ not transfer to another facility deviates from institution's guidelines.

Professional Behavior: Inappropriate – Hospital staff or provider behavior deemed offensive and/or inappropriate as defined by hospital policy. This would include intimidating and disruptive behavior.

Progression of Original Neurological Insult - Documentation by a physician of deterioration or additional loss of function from that noted during hospital stay, i,e, paralysis, paresis or other neurologic sequelae.

Radiology Delay: Interventional Radiology – Interventional Radiology arrival beyond the time expectation defined by your institution/trauma program; Absence of documentation demonstrating timely response or intervention to the ordered consultation.

Radiology Interpretation: Delay -Delay in radiology reading & reporting beyond the time expectation defined by your institution/trauma program.

Radiology Interpretation: Issue - Discrepancy in radiology reading & reporting, either by another radiologist or on subsequent radiographs.

Radiology Imaging Delay: CT - Delay in obtaining a CT scan from time of order beyond the time expectation defined by your institution/trauma program.

Radiology Imaging Delay: Plain Film - Delay in obtaining an x-ray from time of order beyond the time expectation defined by your institution/trauma program.

Readmission: Unplanned - Patients with unplanned readmissions to the hospital (≤30 days) after a previously related hospital admission and discharge from acute care setting.

Resuscitation: Lack of Vascular Access - Lack of appropriate vascular access in the acute resuscitative phase.

Resuscitation: Over - Inordinate volume of intravenous fluid in the absence of clinical findings suggesting hypo perfusion.

Resuscitation: Under - Inadequate fluid replacement in a timely manner to maintain perfusion of organs.

Spine Clearance: Delay - Cervical-spine not cleared within established time frame defined by the institution/trauma program patient management guidelines without documented explanation.

Spine Clearance: Protocol Not Followed - Cervical-collar immobilization removed before patient meets criteria for clearance as per the institution/trauma program patient management guidelines.

Subspecialist: Judgment Issue - Plan of care not evident; omission or delay in implementing plan of care; error in plan of care within the institutions or treatment team's protocol.

Subspecialist: Technical Issue - Error in surgical/ interventional management; error in procedure/iatrogenic injury during procedure resulting in harm or increased length of stay.

Subspecialist: Deviation from guidelines/protocols - Non-justified variance from institution/trauma center guidelines/protocols.

Transfer Delay: Time Unjustified - Unjustified > 3 hrs. at outside hospital; prolonged work up; delay in transport team; excessive work up/studies.

Transfer to Higher Level of Care: Unplanned and in-house patient transfers.

Trauma Surgeon: Judgment Issue - Plan of care not evident; omission or delay in implementing plan of care; error in plan of care within the institutions or treatment team's protocol.

Trauma Surgeon: Deviation from guidelines/protocols - Non-justified variance from institution/trauma program guidelines/protocols.

Trauma Surgeon: Lack of Resident/Advanced Practice Staff Supervision - Lack of evidence of attending oversight for critical decision making/management.

Trauma Surgeon: Technical Issue - Error in surgical/ interventional management; error in procedure, iatrogenic injury during procedure resulting in harms or increased length of stay.

Triage: Over - Overestimating the level of injury; Trauma activation initiated that did not meet institution's Trauma Activation guidelines.

Triage: Under - Failing to initiate or upgrade to appropriate level of trauma activation based on institution's Trauma Activation guidelines.

Hospital Events Menu

Airway
1080, Esophageal Intubation (Inhouse Only)
1069, Unrecognized Mainstem Bronchus Intubation

Burn
1010, Burn Graft Loss (of any percentage) Requiring Repeat Procedure
1013, Burn Wound Cellulitis
1011, Burn Wound Infection Post Excision
1012, Burn Wound Sepsis (occurring in a burn patient; which is related to the burn):
1014, Delay In Donor Site Healing

Cardiovascular
1033, Deep Vein Thrombosis (DVT)
1032, Extremity Compartment Syndrome (not present on admission)
1035, Myocardial Infarction (MI)

Decubitus
1065, Dehiscence/Evisceration
1094, Pressure Ulcer

Gastrointestinal
1083, GI Bleeding
1086, Small Bowel Obstruction (SBO): (excluding ileus)

Hematologic/Coagulopathy
1041, Coagulopathy (excluding anticoagulation therapy, coumadin therapy, or underlying hematologic disorders, e,g, hemophilia)

Hypothermia
1046, Hypothermia

Infection/Sepsis
1078, Acute Sinusitis
1070, Empyema
~~1076, Sepsis~~
1101, Urinary Tract Infection (UTI) (does not including CAUTI) (not present on admission)
1213, Deep Surgical Site Infection
1214 Organ/Space Surgical Site Infection
1215 Superficial Surgical Site Infection
1216 Osteomyelitis

Neurologic
1064, CNS Infection

NTDS
1210, Alcohol Withdrawal Syndrome
1206, Cardiac Arrest with CPR
1208, Catheter Associated Urinary Tract Infection
1209, Central Line-Associated Bloodstream Infection (CLABSI)
1211, Delirium
1205, Stroke/CVA
1204, Unplanned Admission to the ICU
1202, Unplanned Intubation
1203, Unplanned Visit to the Operating Room
1207, Ventilator-Associated Pneumonia

Pharmacology
1049, Adverse Drug Reaction

Post-Operative Hemorrhage
1047, Post-Operative Hemorrhage

Procedure Related
1091, Iatrogenic Organ, Nerve, Vessel

Pulmonary
1020, Acute Respiratory Distress Syndrome (ARDS):
1022, Aspiration/Aspiration Pneumonia
1024, Fat Embolus Syndrome
1027, Iatrogenic Pneumothorax
1100, Pneumonia (Does not include VAP)
1028, Pulmonary Embolus (PE)

Renal
1050, Acute Kidney Injury

Hospital Events Definitions:

Definition: An occurrence is defined as an unexpected event directly affecting patient care
Intent: Directly affect care and outcome; used to determine what factors contributed to morbidity and mortality; used in filter calculation

Note: Menu numbers in the Collector registry and Outcomes v5 do not match. The numbers below in the definitions are taken from the registry menu.

NONE

01 = **None:** patient's hospital course has no identifiable clinical problems. When "01" is recorded the Date and Location elements will be automatically skipped.

PULMONARY

20 = **Acute Respiratory Distress Syndrome (ARDS): utilize the NTDB Hospital Event definition for Acute Respiratory Distress Syndrome (ARDS) which states: (**Consistent with the 2012 New Berlin Definition)
Timing: Within 1 week of known clinical insult or new or worsening respiratory symptoms.
Chest imaging: Bilateral opacities – not fully explained by effusions, lobar/lung collage, or nodules
Origin of edema: Respiratory failure not fully explained by cardiac failure of fluid overload. Need objective assessment (e.g., echocardiography) to exclude hydrostatic edema if no risk factor present
Oxygenation:
Mild: 200 mm Hg < Pa02/Fi02 ≤ 300 mm Hg With PEEP or CPAP ≥ 5 cm H20c
Moderate: 100 mm Hg < PaO2/FIO2 < 200 mm Hg With PEEP >5 cm H2O
Severe: PaO2/FIO2 < 100 mm Hg With PEEP or CPAP >5 cm H2O
Must have occurred during the patient's initial stay at your hospital.
A diagnosis of ARDS must be documented in the patient's medical record.

22 = **Aspiration/Aspiration Pneumonia:** documented inhalation of gastric contents or other materials followed by clinical and new radiological findings of pneumonitis which requires treatment within 48 hours,

24 = **Fat Embolus Syndrome:** documented diagnosis by an attending physician in a patient with pelvic or extremity fractures and a decreased PO_2,
One of the following must also be present:
1, change in mental status,
2, petechial signs,
3, tachypnea,
4, fat in urine, or
5, decreased platelets,

27 = **Iatrogenic Pneumothorax:** presence of intrapleural air not present on admission radiograph, resulting from treatment or intervention

28 = **Pulmonary Embolus (PE):** utilize the NTDB Hospital Event definition for Pulmonary Embolism (PE) which states: A lodging of a blood clot in a pulmonary artery with subsequent obstruction of blood supply to the lung parenchyma. The

blood clots usually originate from the deep leg veins or the pelvic venous system. Consider the condition present if the patient has a V-Q scan interpreted as high probability of pulmonary embolism or a positive pulmonary arteriogram or positive CT angiogram and/or a diagnosis of PE is documented in the patient's medical record. Exclude subsegmental PEs. Must have occurred during the patient's initial stay at your hospital.

100 = **Pneumonia (does not include VAP (ventilator-associated pneumonia):** which is defined as a patient with evidence of pneumonia that develops during the hospitalization without clinical evidence of inhalation injury, Patients with pneumonia must meet at least one of the following two criteria:

Criterion 1, Rales or dullness to percussion on physical examination of chest AND any of the following:

a, New onset of purulent sputum or change in character of sputum

b, Organism isolated from blood culture

c, Isolation of pathogen from specimen obtained by transtracheal aspirate, bronchial brushing, or biopsy

Criterion 2, Chest radiographic examination shows new or progressive infiltrate, consolidation, Cavitation, or pleural effusion AND any of the following:

a, New onset of purulent sputum or change in character or sputum

b, Organism isolated from the blood

c, Isolation of pathogen from specimen obtained by transtracheal aspirate, bronchial brushing, or biopsy

d, Isolation of virus or detection of viral antigen in respiratory secretions

e, Diagnostic single antibody titer (IgM) or fourfold increase in paired serum samples (IgG) for pathogen

f, Histopathologic evidence of pneumonia

CARDIOVASCULAR

32 = **Extremity Compartment Syndrome**: utilize the NTDB Hospital Event definition for Extremity Compartment Syndrome, defined as a condition not present at admission in which there is documentation of tense muscular compartments of an extremity through clinical assessment or direct measurement of intracompartmental pressure requiring fasciotomy. Compartment syndromes usually involve the leg but can also occur in the forearm, arm, thigh, and shoulder. Record as a hospital event if it is originally missed, leading to late recognition, a need for late intervention, and has threatened limb viability. Must have occurred during the patient's initial stay at your hospital. A diagnosis of extremity compartment syndrome must be documented in the patient's medical record.

33 = **Deep Vein Thrombosis (DVT):** utilize the NTDB Hospital Event definition for Deep Vein Thrombosis, which states: The formation, development, or existence of a blood clot or thrombus within the venous system, which may be coupled with inflammation. A diagnosis of DVT must be documented in the patient's medical record, which may be confirmed by a venogram, ultrasound, or CT. The patient must be treated with anticoagulation therapy and/or placement of a vena cava filter or clipping of the vena cava. Must have occurred during the patient's initial stay at your hospital.

35 =**Myocardial Infarction**: utilize the NTDB Hospital Event definition for Myocardial Infarction (MI), which states: An acute myocardial infarction must be noted with documentation of ECG changes indicative of an acute MI
AND

New elevation in troponin greater than three times upper level of the reference range in the setting of suspected myocardial ischemia
AND

Physician diagnosis of an acute myocardial infarction that occurred subsequent to arrival at your center
Must have occurred during the patient's initial stay at your facility.

HEMATOLOGIC/COAGULOPATHY

41 = **Coagulopathy** *(excluding anticoagulation therapy, coumadin therapy, or underlying hematologic disorders (e.g. hemophilia))*: Uncontrolled diffuse bleeding in the presence of coagulation abnormalities (e.g., increased prothrombin time, increased partial thromboplastin time, decreased platelet count, elevated R and/or K times in the TEG, or elevated Clotting Time in the ROTEM). or disseminated intravascular coagulation (DIC) requiring treatment (i.e. transfusion of components such as platelets, clotting factors, or FFP)

RENAL

50 = **Acute Kidney Injury**: utilize the NTDB Hospital Event definition for Acute Kidney Injury (Consistent with the March 2012 Kidney Disease Improving Global Outcome (KDIGO) Guideline) which states:

Acute Kidney Injury, AKI (stage 3), is an abrupt decrease in kidney function.
KDIGO (Stage 3) Table:
Serum Creatinine (SCr):
3 times baseline
OR
Increase in SCr to ≥ 4.0 mg/dl (≥ 353.6 µmol/l)
OR
Initiation of renal replacement therapy OR, In patients < 18 years, decrease in eGFR to <35 ml/min per 1.73 m^2
OR
Urine Output:
Urine output <0.3 ml/kg/h for ≥ 24 hours
OR
Anuria for ≥12 hours

NOTE: If the patient or family refuses treatment (e.g., dialysis) the condition is still considered to be present if a combination of oliguria and creatinine are present. EXCLUDE patients with renal failure that were requiring chronic renal replacement therapy such as periodic peritoneal dialysis, hemodialysis, hemofiltration, or hemodiafiltration prior to injury. Must have occurred during the patient's initial stay at your hospital. A diagnosis of AKI must be documented in the patient's medical record.

INFECTION/SEPSIS

70 = **Empyema:** infection documented by purulent material or positive culture from the pleural space requiring therapeutic intervention

76 = **Sepsis:** documented by a physician with at least two or more of the following conditions (which occur at the same time):

1. core temperature of > 38^0 C or $\leq$ 36^0 C
2. white blood cell count > 12,000 or < 4,000 or > 10% immature bands
3. positive blood cultures (excluding contaminants)
4. clinically obvious source of infection
5. heart rate > 90 beats/min or respiratory rate > 20 breaths/min

78 = **Acute sinusitis:** opacification on x-ray or CT with fever and/or positive purulent drainage requiring treatment

101 = **Urinary Tract Infection (UTI) (not present on admission, NOT including CAUTI (catheter-associated urinary tract infection):** clean voided or other catheter urine specimen with ≥ 100,000 organisms/ml on C/S, Physician institutes appropriate therapy for a urinary tract infection
An infection is considered Present on Admission (POA) if the date of event of the NHSN site-specific infection criterion occurs during the POA time period, which is defined as the day of admission to an inpatient location (calendar day 1), the 2 days before admission, and the calendar day after admission. CDC guidelines used as reference.

AIRWAY MANAGEMENT

80 = **Esophageal Intubation (Inhouse Only):** endotracheal tube in esophagus and not immediately repositioned, Esophageal location determined by physical exam, x-ray, capnography or endoscopy.

69 = **Unrecognized Mainstem Bronchus Intubation:** any endotracheal intubation procedure resulting in definitive placement of the tube in either the right or left mainstem bronchus.
a, recognized and treated immediately - not reportable
b, unrecognized on 2 successive chest x-rays - reportable

GASTROINTESTINAL

83 = **GI Bleeding:** blood loss from anywhere in the GI tract, grossly positive nasogastric (NG) aspirate, or grossly positive stool which requires treatment,

86 = **Small Bowel Obstruction (SBO): (excluding ileus)** radiographic evidence of dilated loop of bowel with multiple air-fluid levels and confirmed by a surgeon requiring treatment (surgery or NG tube),

NEUROLOGIC

64 = **CNS Infection:** CSF aspirate with positive culture and increased white blood cell count

PROCEDURE RELATED

91 = **Iatrogenic Organ, Nerve, Vessel:** perforation or injury resulting from treatment or intervention,

DECUBITUS

65 = **Dehiscence/Evisceration:** breakdown of fascial closure confirmed by discharge of peritoneal fluid, evisceration or palpable fascial defect. This hospital event pertains to the abdominal area only.

94 = **Pressure ulcer:** Utilize NTDB Complication definition for Pressure Ulcer, defined as (*Consistent with the National Pressure Ulcer Advisory Panel (NPUAP) 2014) defined as* A localized injury to the skin and/or underlying tissue usually over a bony prominence, as a result of pressure, or pressure in combination with shear, A number of contributing or confounding factors are also associated with pressure ulcers; the significance of these factors is yet to be elucidated, Equivalent to NPUAP Stages II-IV, Unstageable/Unclassified, and Suspected Deep Tissue Injury, Documentation of Pressure Ulcer must be in the patient's medical record, and must have occurred during the patient's initial stay at your hospital

HYPOTHERMIA

46 = **Hypothermia:** (nontherapeutic) rectal or core temperature ≤ 34° C or 93.2 ° F

If the patient presents to the hospital with hypothermia, the hypothermia is considered a diagnosis. If the hypothermia presents during the hospital stay and is unexpected, the hypothermia is considered a hospital event.

POST-OPERATIVE HEMORRHAGE

47 = **Post-Operative Hemorrhage:** requiring operative intervention,
Procedures done in angio to control the hemorrhage should be considered operative interventions and the hemorrhage should be included as a hospital event.

PHARMACOLOGY

49 = **Adverse Drug Reaction:** As documented by a physician, plus one of the following:

1. Adversely affects patient care
2. Increases length of stay
3. Increases morbidity and mortality

BURNS (Only required for burn patients at burn centers)

10 = **Burn Graft Loss Requiring Repeat Procedure:** documented by a physician (includes split thickness graft and free flap loss)

11 = **Burn Wound Infection Post Excision:** documented diagnosis by a physician (***after*** excision),

12 = **Burn Wound Sepsis (occurring in a burn patient; which is related to the burn):** documented by a physician of drainage of purulent material from the wound, active treatment of the wound, or administration of antibiotics for the wound,

13 = **Burn Wound Cellulitis:** any documented diagnosis by a physician which includes fungal infection,

14 = **Delay in Burn Donor Site Healing:** documented by a physician of any healing which begins ***greater than*** 14 days post-surgical procedure,

NTDS HOSPITAL COMPLICATIONS

202 = **Unplanned intubation:** Patient requires placement of an endotracheal tube and mechanical or assisted ventilation because of the onset of respiratory or cardiac failure manifested by severe respiratory distress, hypoxia, hypercarbia, or respiratory acidosis. For patients who were intubated in the field or Emergency Department, or those intubated for surgery, unplanned intubation occurs if they require reintubation > 24 hours after extubation. Must have occurred during the patient's initial stay at your hospital.

204 = **Unplanned admission to ICU: utilize the NTDB Hospital Event definition which states:** Patients admitted to the ICU after initial transfer to the floor, and/or patients with an unplanned return to the ICU after initial ICU discharge. EXCLUDE: Patients in which ICU care was required for postoperative care of a planned surgical procedure. Must have occurred during the patient's initial stay at your hospital.

Clarifications and examples from TQIP staff and TQIP Collaborative:
Virtual Upgrades:

- Do not include a change in orders for the patient to go to the ICU during the resuscitative phase. The patient is still being evaluated during this time.
- Do **not** include patients admitted in the ICU with an order to leave the ICU, but ultimately stays in the ICU

Perioperative:

- For an anticipated or planned operation, if it was pre-operatively planned that the patient would go to the ICU, the patient should not be counted.
  - Patient in OR, ICU stay was determined necessary prior to surgery
  - Patient going to OR, planned to go to ICU postoperatively due to comorbid condition
- For patients in which ICU care was required for postoperative care of an unplanned surgical procedure, record Unplanned Admission to ICU.
  - If the patient has a change in condition that requires an emergent or urgent operation and patient goes to the ICU postoperatively, the patient should be counted
- If decision for ICU admission was made intraoperatively or in PACU, it should be counted as an ICU unplanned admission. (i.e. intraoperative blood loss, decision to leave patient intubated intraoperatively)
  - Patient in OR, ICU stay determined during or after surgery

Post-procedural care:

- If you need to intubate someone electively for an MRI, for example, and you only take intubated patient to the ICU, the patient should not be counted.
- If you intubate someone for respiratory distress during an MRI, for example, this patient should be counted.

Medical Upgrades in Care:

- Any admission to the ICU for a medical upgrade in care that was not planned on admission should be counted. This includes but is not limited to: New Arrhythmia, Post admission MI, Seizure during hospitalization, in-house Neurologic decline, respiratory failure post admission, alcohol withdrawal post admission.

205 = **Stroke/CVA: utilize the NTDB Hospital Event definition which states:** A focal or global neurological deficit of rapid onset and NOT present on admission.

The patient must have at least one of the following symptoms:

- Change in level of consciousness
- Hemiplegia
- Hemiparesis
- Numbness or sensory loss affecting one side of the body
- Dysphasia or aphasia
- Hemianopia
- Amaurosis fugax
- Or other neurological signs or symptoms consistent with stroke

AND

- Duration of neurological deficit ≥ 24 h

OR

- Duration of deficit <24 h, if neuroimaging (MR, CT, or cerebral angiography) documents a new hemorrhage or infarct consistent with stroke, or therapeutic intervention(s) were performed for stroke, or the neurological deficit results in death

AND

- No other readily identifiable non-stroke cause, e.g., progression of existing traumatic brain injury, seizure, tumor, metabolic or pharmacologic etiologies, is identified

AND

- Diagnosis is confirmed by neurology or neurosurgical specialist or neuroimaging procedure (MR, CT, angiography) or lumbar puncture (CSF demonstrating intracranial hemorrhage that was not present on admission).

A diagnosis of Stoke/CVA must be documented in the patient's medical record. Although the neurologic deficit must not present on admission, risk factors predisposing to stroke (e.g., blunt cerebrovascular injury, dysrhythmia) may be present on admission. Must have occurred during the patient's initial stay at your hospital

206 = **Cardiac Arrest with CPR**: **utilize the NTDB Hospital Event definition which states:** Cardiac arrest is the sudden cessation of cardiac activity after hospital arrival. The patient becomes unresponsive with no normal breathing and no signs of circulation. If corrective measures are not taken rapidly, this condition progresses to sudden death.

Must have occurred during the patient's initial stay at your hospital. Cardiac arrest must be documented in the patient's medical record.

EXCLUDE patients whose ONLY episode of cardiac arrest with CPR was on arrival to your hospital.

INCLUDE patients who, after arrival at your hospital, have had an episode of cardiac arrest evaluated by hospital personnel, and received compressions or defibrillation or cardioversion or cardiac pacing to restore circulation.

207 = **Ventilator-Associated Pneumonia (VAP)** = utilize the NTDB Hospital Event definition (Consistent with the January 2019 CDC defined VAP), which states: A pneumonia where the patient is on mechanical ventilation for >2 calendar days on the date of event, with day of ventilator placement being Day 1,
AND
The ventilator was in place on the date of event or the day before.
Must have occurred during the patient's initial stay at your hospital. A diagnosis of pneumonia must be documented in the patient's medical record.
DO NOT also code 100 = Pneumonia
See NTDB Data Dictionary for VAP algorithm

208 **= Catheter Associated Urinary Tract Infection (CAUTI)** = **utilize the NTDB Hospital Event definition (*Consistent with the January 2019 CDC defined CAUTI*) which states**: A urinary tract infection (UTI) where an indwelling urinary catheter was in place for >2 calendar days on the date of event, with day of device placement being Day 1,

AND

An indwelling urinary catheter was in place on the date of event or the day before. If an indwelling urinary catheter was in place for >2 calendar days in an inpatient location and then removed, the date of event for the UTI must be the day of device discontinuation or the next day for the UTI to be catheter-associated.

January 2019 CDC CAUTI Criterion SUTI 1a:
Patient must meet 1, 2, **and** 3 below:

1. Patient had an indwelling urinary catheter that had been in place for more than 2 consecutive days in an inpatient location on the date of event AND was either:
    - Present for any portion of the calendar day on the date of event, OR
    - Removed the day before the date of event
2. Patient has at least **one** of the following signs or symptoms:
    - Fever (>38°C): Reminder: To use fever in a patient >65 years of age, the IUC needs to be in place for more than 2 consecutive days in an inpatient location on date of event and is either still in place OR was removed the day before the DOE.
    - Suprapubic tenderness
    - Costovertebral angle pain or tenderness
    - Urinary urgency
    - Urinary frequency
    - dysuria
3. Patient has a urine culture with no more than two species of organisms identified, at least one of which is a ~~bacteria~~ bacterium >10^5 CFU/ml.

January 2019 CDC CAUTI Criterion SUTI 2:
Patient must meet 1, 2 **and** 3 below:
1. Patient is ≤1 year of age
2. Patient has at least **one** of the following signs or symptoms:
    - fever (>38.0°C)
    - hypothermia (<36.0°C)
    - apnea
    - bradycardia
    - lethargy
    - vomiting
    - suprapubic
3. Patient has a urine culture with no more than two species of organisms, at least one of which is a bacterium of ≥10^5 CFU/ml.

Must have occurred during the patient's initial stay at your hospital. A diagnosis of UTI must be documented in the patient's medical record.

209 = **Central line-associated bloodstream infection (CLABSI) = utilize the NTDB Hospital Event definition** (***Consistent with the January 2016 CDC Defined CLABSI*****) which states:** A laboratory-confirmed bloodstream infection (LCBI) where central line (CL) or umbilical catheter (UC) was in place for >2 calendar days on the date of event, with day of device placement being Day 1,

AND

The line was also in place on the date of event or the day before. If a CL or UC was in place for > 2 calendar days and then removed, the date of event of the LCBI must be the day of discontinuation or the next day to be a CLABSI. If the patient is admitted or transferred into a facility with an implanted central line (port) in place, and that is the patient's only central line, day of first access in an inpatient location is considered Day 1. "Access" is defined as line placement, infusion or withdrawal through the line. Such lines continue to be eligible for CLABSI once they are accessed until they are either discontinued or the

day after patient discharge (as per the Transfer Rule.) Note that the "de-access" of a port does not result in the patient's removal from CLABSI surveillance.

Must have occurred during the patient's initial stay at your hospital. A diagnosis of CLABSI must be documented in the patient's medical record.

See NTDB Data Dictionary for CDC Criterion

210 **= Alcohol Withdrawal Syndrome: utilize the NTDB Hospital Event definition (*Consistent with the 2019 World Health Organization (WHO) definition Of Alcohol Withdrawal Syndrome.*) which states:** Characterized by tremor, sweating, anxiety, agitation, depression, nausea, and malaise. It occurs 6-48 hours after cessation of alcohol consumption, and when uncomplicated, abates after 2-5 days. It may be complicated by grand mal seizures and may progress to delirium (known as delirium tremens). Must have occurred during the patient's initial stay at your hospital. Documentation of alcohol withdrawal must be in the patient's medical record.

211 = **Delirium: utilize the NTDB Hospital Event definition for Delirium which states -**

Acute onset of behaviors characterized by restlessness, illusions, and incoherence of thought and speech. Delirium can often be traced to one or more contributing factors, such as a severe or chronic medical illness, changes in your metabolic balance (such as low sodium), medication, infection, surgery, or alcohol or drug withdrawal.

OR

Patient tests positive after using an objective screening tool like the Confusion Assessment Method (CAM or the Intensive Care Delirium Screening Checklist (ICDSC).

OR

A diagnosis of delirium documented in the patient's medical record.

Must have occurred during the patient's initial stay at your hospital.
EXCLUDE: Patient's whose delirium is due to alcohol withdrawal.

212 – Unplanned Visit to the Operating Room – utilize the NTDB Hospital Event definition which states

Patients with an unplanned operative procedure OR patients returned to the operating room after initial operation management of a related previous procedure. Must have occurred during the patient's initial stay at your hospital.
EXCLUDE: Pre-planned, staged and/or procedures for incidental findings.
EXCLUDE: Operative management related to a procedure that was initially performed prior to arrival at your center.

213 – Deep Surgical Site Infection – utilize the NTDB Hospital Event definition *(Consistent with the January 2019 CDC defined SSI)* which states

Must meet the following criteria:
Infection occurs within 30 or 90 days after the NHSN operative procedure (where day 1 = the procedure date) According to list in Table 2
AND
involves deep soft tissues of the incision (e.g., fascial and muscle layers)

AND
Patient has at least one of the following:

a. purulent drainage from the deep incision.

b. a deep incision that spontaneously dehisces, or is deliberately opened or aspirated by a surgeon, attending physician** or other designee d
AND
Organism(s) identified from the deep soft tissues of the incision by culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (for example, not Active Surveillance Culture/Testing (ASC/AST) or culture or non-culture based microbiologic testing method is not performed. A culture or non-culture based test from the deep soft tissues of the incision that has a negative finding does not meet this criterion.
AND
Patient has at least one of the following signs or symptoms: fever (>38°C); localized pain or tenderness.

c. an abscess or other evidence of infection involving the deep incision that is detected on gross anatomical or histopathologic exam, or imaging test

* The term attending physician for the purposes of application of the NHSN SSI criteria may be interpreted to mean the surgeon(s), infectious disease, other physician on the case, emergency physician, or physician's designee (nurse practitioner or physician's assistant).

COMMENTS: There are two specific types of deep incisional SSIs:
1. Deep Incisional Primary (DIP) – a deep incisional SSI that is identified in a primary incision in a patient that has had an operation with one or more incisions (e.g., C-section incision or chest incision for CBGB)
2. Deep Incisional Secondary (DIS) – a deep incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision (e.g., donor site incision for CBGB)

Table 2. Surveillance Period for Deep Incisional or Organ/Space SSI Following Selected NHSN Operative Procedure Categories. Day 1 = the date of the procedure

30 – day Surveillance			
Category	**Operative Procedure**	**Category**	**Operative Procedure**
AAA	Abdominal aortic aneurysm repair	LAM	Laminectomy
AMP	Limb amputation	LTP	Liver transplant
APPY	Appendix surgery	NECK	Neck surgery
AVSD	Shunt for dialysis	NEPH	Kidney surgery
BILI	Bile duct, liver or pancreatic surgery	OVRY	Ovarian surgery
CEA	Carotid endarterectomy	PRST	Prostate surgery
CHOL	Gallbladder surgery	REC	Rectal surgery
COLO	Colon surgery	SB	Small bowel surgery
CSEC	Cesarean section	SPLE	Spleen surgery

GAST	Gastric surgery	THOR	Thoracic surgery
HTP	Heart transplant	THYR	Thyroid and/or parathyroid surgery
HYST	Abdominal hysterectomy	VHYS	Vaginal hysterectomy
KTP	Kidney transplant	XLAP	Exploratory laparotomy

90-day Surveillance

Category	**Operative Procedure**
BRST	Breast surgery
CARD	Cardiac Surgery
CBGB	Coronary artery bypass graft with both chest and donor site incisions
CBGC	Coronary artery bypass graft with chest incision only
CRAN	Craniotomy
FUSN	Spinal fusion
FX	Open reduction of fracture
HER	Herniorrhaphy
HPRO	Hip prosthesis
KPRO	Knee prosthesis
PACE	Pacemaker surgery
PVBY	Peripheral vascular bypass surgery
VSHN	Ventricular shunt

Additional Information

- Must have occurred during the patient's initial stay at your hospital.
- A diagnosis of SSI must be documented in the patient's medical record.
- Secondary incisional SSIs are only followed for a 30-day period regardless of the surveillance period for the primary site.

214 – Organ/Space Surgical Site Infection – utilize the NTDB Hospital Event definition *(Consistent with the January 2019 CDC defined SSI*) which states

Must meet the following criteria:

Infection occurs within 30 or 90 days after the NHSN operative procedure (where day 1 = the procedure date) according to the list in Table 2

AND

infection involves any part of the body deeper than the fascial/muscle layers, that is opened or manipulated during the operative procedure

AND

patient has at least *one* of the following:

a. purulent drainage from a drain that is placed into the organ/space (e.g., closed suction drainage system, open drain, T-tube drain, CT guided drainage)

b. organisms are identified from fluid or tissue in the organ/space by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (e.g., not Active Surveillance Culture/Testing (ASC/AST).

c. an abscess or other evidence of infection involving the organ/space that is detected on gross anatomical or histopathologic exam, or imaging test evidence suggestive of infection.

AND

meets at least one criterion for a specific organ/space infection site listed in Table 3. These criteria are found in the Surveillance Definitions for Specific Types of Infections chapter.

Table 2. Surveillance Period for Deep Incisional or Organ/Space SSI Following Selected NHSN Operative Procedure Categories. Day 1 = the date of the procedure

30 – day Surveillance			
Category	**Operative Procedure**	**Category**	**Operative Procedure**
AAA	Abdominal aortic aneurysm repair	LAM	Laminectomy
AMP	Limb amputation	LTP	Liver transplant
APPY	Appendix surgery	NECK	Neck surgery
AVSD	Shunt for dialysis	NEPH	Kidney surgery
BILI	Bile duct, liver or pancreatic surgery	OVRY	Ovarian surgery
CEA	Carotid endarterectomy	PRST	Prostate surgery
CHOL	Gallbladder surgery	REC	Rectal surgery
COLO	Colon surgery	SB	Small bowel surgery
CSEC	Cesarean section	SPLE	Spleen surgery
GAST	Gastric surgery	THOR	Thoracic surgery
HTP	Heart transplant	THYR	Thyroid and/or parathyroid surgery
HYST	Abdominal hysterectomy	VHYS	Vaginal hysterectomy
KTP	Kidney transplant	XLAP	Exploratory laparotomy

90-day Surveillance	
Category	**Operative Procedure**
BRST	Breast surgery
CARD	Cardiac Surgery
CBGB	Coronary artery bypass graft with both chest and donor site incisions
CBGC	Coronary artery bypass graft with chest incision only
CRAN	Craniotomy
FUSN	Spinal fusion
FX	Open reduction of fracture
HER	Herniorrhaphy
HPRO	Hip prosthesis
KPRO	Knee prosthesis
PACE	Pacemaker surgery
PVBY	Peripheral vascular bypass surgery
VSHN	Ventricular shunt

Additional Information

- Must have occurred during the patient's initial stay at your hospital
- A diagnosis of SSI must be documented in the patient's medical record
- Secondary incisional SSIs are only followed for a 30-day period regardless of the surveillance period for the primary site

215 – Superficial Surgical Site Infection – utilize the NTDB Hospital Event definition *(Consistent with the January 2019 CDC defined SSI*) which states

Must meet the following criteria:
Infection occurs within 30 days after any NHSN operative procedure (where day 1 = the procedure date)
AND
involves only skin and subcutaneous tissue of the incision
AND
patient has at least *one* of the following:

a. purulent drainage from the superficial incision.

b. organisms identified from an aseptically-obtained specimen from the superficial incisionor sub cutaneous tissue by a culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis or treatment (e.g., not Active Surveillance Culture/Testing (ASC/AST)),

c. superficial incision that is deliberately opened by a surgeon, attending physician** or other designee and culture or non-culture based testing is not performed.
AND
patient has at least one of the following signs or symptoms: pain or tenderness; localized swelling; erythema; or heat.

d. diagnosis of a superficial incisional SSI by a physician** or physician designee.

*The term attending physician for the purposes of application of the NHSN SSI criteria may be interpreted to mean a surgeon, infectious disease physician, emergency physician, other physician on the case, or physician's designee (nurse practitioner or physician's assistant).

COMMENTS: There are two specific types of superficial incisional SSIs:
1. Superficial Incisional Primary (SIP) – a superficial incisional SSI that is identified in the primary incision in a patient that has had an operation with one or more incisions (e.g., C- section incision or chest incision for CBGB)
2. Superficial Incisional Secondary (SIS) – a superficial incisional SSI that is identified in the secondary incision in a patient that has had an operation with more than one incision (e.g., donor site incision for CBGB)

Additional Information:

The following do not qualify as criteria for meeting the NHSN definition of superficial incisional SSI:

- Diagnosis/treatment of cellulitis (redness/warmth/swelling), by itself, does not meet criterion "d" for superficial incisional SSI. Conversely, an incision that is draining or that has organisms identified by culture or non-culture based testing is not considered a cellulitis.

- A stitch abscess alone (minimal inflammation and discharge confined to the points of suture penetration).
- For an NHSN operative procedure, a laparoscopic trocar site is considered a surgical incision and not a stab wound.
- A localized stab wound or pin site infection is not considered an SSI; depending on the depth, these infections might be considered either a skin (SKIN) or soft tissue (ST) infection
- Must have occurred during the patient's initial stay at your hospital.
- A diagnosis of SSI must be documented in the patient's medical record
- Superficial incisional SSIs are only followed for a 30-day period for all procedure types.
- Secondary incisional SSIs are only followed for a 30-day period regardless of the surveillance period for the primary site..

Refer to the 2021 NTDS Data Dictionary for Table 3 - Specific Sites of an Organ/Space SSI.

216 – Osteomyelitis – utilize the NTDB Hospital Event definition *(Consistent with the January 2016 CDC definition of Bone and Joint Infection)* which states
Osteomyelitis must meet at least one of the following criteria:

1. Patient has organisms identified from bone by culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis and treatment (e.g., not Active Surveillance Culture/Testing (ASC/AST)).
2. Patient has evidence of osteomyelitis on gross anatomic or histopathologic exam.
3. Patient has at least ***two*** of the following localized signs or symptoms: fever (>38.0°C), swelling*, pain or tenderness*, heat*, or drainage*
   And at least one of the following:
   a. organisms identified from blood by culture or non-culture based microbiologic testing method which is performed for purposes of clinical diagnosis and treatment (e.g., not Active Surveillance Culture/Testing (ASC/AST)) in a patient with imaging test evidence suggestive of infection (e.g., x-ray, CT scan, MRI, radiolabel scan [gallium, technetium, etc.]), which if equivocal is supported by clinical correlation (i.e., physician documentation
   of antimicrobial treatment for osteomyelitis).
   b. imaging test evidence suggestive of infection (e.g., x-ray, CT scan, MRI, radiolabel scan [gallium, technetium, etc.]), which if equivocal is supported by clinical correlation (i.e., physician documentation of antimicrobial treatment for osteomyelitis).

*** With no other recognized cause**

Additional Information

- Report mediastinitis following cardiac surgery that is accompanied by osteomyelitis as SSIMED rather than SSI-BONE.
- If a patient meets both organ space JNT and BONE report the SSI as BONE.
- After an HPRO or a KPRO if a patient meets both organ space PJI and BONE report the SSI as BONE
- Must have occurred during the patient's initial stay at your hospital.

A diagnosis of osteomyelitis must be documented in the patient's medical record

Pre-Existing Conditions Menu

22102, Coronary Artery Disease
22103, Congestive Heart Failure
22105, Myocardial Infarction
22106, Hypertension
22203, Diabetes Mellitus
22301, Peptic Ulcer Disease
22302, Gastric or Esophageal Varices
22305, Bariatric Surgery
22408, Bleeding Disorder
22409, Chronic Aspirin Use
22410, Anticoagulant Therapy
22400, Mental/Personality Disorder
22501, Attention Deficit Disorder
22502, Intellectual Disability
22601, HIV/AIDS
22602, Routine Steroid Therapy
22603, Transplants
22604, Active Chemotherapy
22702, Documented History of Cirrhosis
22801, Undergoing Current Therapy
22802, Concurrent or Existence of Metastasis
22901, Arthritis
22902, Systematic Lupus Erythematosus
22903, Osteogenesis Imperfecta (OI)
23001, Spinal Cord Injury
23009, CVA
23010, Autism Spectrum
23011, Cerebral Palsy
23012, Dementia
23100, Obesity
23205, Chronic Obstructive Pulmonary Disease (COPD)
23301, Serum Creatinine > 2 mg % (On admission)
23302, Dialysis
23401, Substance Use Disorder
23402, Chronic Ongoing Alcohol Abuse
23403, Vaping and E-Cigarette Use
23600, Pregnancy
23701, Previous History of Head Trauma
23801, Thyroid Disease
23902, Current Smoker
23903, Advanced Directive Limited Care
23904, Functionally Dependent Health Status
23906, Peripheral Arterial Disease (PAD)
23907, Prematurity
23908, Pre-hospital Cardiac Arrest
23909, Angina Pectoris
24000, Congenital Disorder

Pre-Existing Condition Definitions:

Definition: Pre-existing co-morbid factors present before patient arrival at the ED/hospital
Intent : To capture specific conditions, prior to injury that the patient presents with at time of admission; these conditions were not caused by their injury, but will often have a direct effect on their treatment, length of stay and ability to recover
These must be documented in the medical record (e.g., H&P, laboratory, radiology, operative report, consultation, autopsy report, etc.,), Certain conditions are further described in the definitions.

A,02 – Coronary Artery Disease – A condition caused by plaque buildup inside the coronary arteries which reduces the blood flow through the arteries to the heart muscle and typically results in chest pain or heart damage, It also causes formation of blood clots, CAD must be documented by a physician. Condition includes a revascularization, but not angioplasty, stent, CABG or a cardiac catheterization by itself.

A,03 – Congestive Heart Failure – utilize the NTDB Co-Morbid Condition definition for Congestive Heart Failure: which is defined as the inability of the heart to pump a sufficient quantity of blood to meet the metabolic needs of the body or can do so only at an increased ventricular filling pressure, To be included, this condition must be noted in the medical record as CHF, congestive heart failure, or pulmonary edema with onset or increasing symptoms within 30 days prior to injury, Common manifestations are:

- Abnormal limitation in exercise tolerance due to dyspnea or fatigue
- Orthopnea (dyspnea on lying supine)
- Paroxysmal nocturnal dyspnea (awakening from sleep with dyspnea)
- Increased jugular venous pressure

- Pulmonary rales on physical examination
- Cardiomegaly
- Pulmonary vascular engorgement

Present prior to injury. A diagnosis of CHF must be documented in the patient's medical record.

A,05 – **Myocardial Infarction** – Utilize the NTDB Co-morbid condition definition for Myocardial Infarction which is defined as History of a MI in the six months prior to injury, A diagnosis of MI must be documented in the patient's medical record. Present prior to injury.

A,06 – **Hypertension requiring medication** – utilize the NTDB definition for Hypertension which is defined as History of persistent elevated blood pressure requiring medical therapy. Present prior to injury. A diagnosis of Hypertension must be documented in the patient's medical record.

B,03 - **Diabetes Mellitus – utilize the NTDB definition for Diabetes Mellitus** which is defined as diabetes mellitus that requires exogenous parenteral insulin or an oral hypoglycemic agent. A diagnosis of Diabetes Mellitus must be documented in the patient's medical record. Present prior to injury.

C,01 – **Peptic Ulcer Disease** – Is a raw area (erosion) of the lining of the intestinal tract, Peptic ulcers are typically found in the lower half of the stomach or the first part of the duodenum.

C,02 – **Gastric or Esophageal Varices** – which is defined as esophageal varices are engorged collateral veins in the esophagus which bypass a scarred liver to carry portal blood to the superior vena cava, A sustained increase in portal pressure results in esophageal varices which are most frequently demonstrated by direct visualization at esophagoscopy,

C,05 – **Bariatric Surgery** – Bariatric surgery, or weight loss surgery, includes a variety of procedures performed on people who are obese, Weight loss is achieved by reducing the size of the stomach with an implanted medical device (gastric banding) or through removal of a portion of the stomach (sleeve gastrectomy or biliopancreatic diversion with duodenal switch) or by resecting and re-routing the small intestines to a small stomach pouch (gastric bypass surgery). Also includes: Jejunoileal bypass, endoluminal sleeve, vertical banding gastroplasty, adjustable gastric band, sleeve gastrectomy, intragastric balloon (Gastric balloon), Gastric Plication, Gastric bypass surgery, sleeve gastrectomy with duodenal switch, implantable gastric stimulation.

D,08 –**Bleeding Disorder** –**utilize the NTDB definition for Bleeding Disorder** (*Consistent with the American Society of Hematology, 2015*) A group of conditions that result when the blood cannot clot properly, present prior to injury, A Bleeding Disorder diagnosis must be documented in the patient's medical record (e.g., Hemophilia, von Willenbrand Disease, Factor V Leiden,)

D,09 – **Chronic Aspirin Use** – Aspirin taken at least once daily.

D,10 – **Anticoagulant Therapy** - Utilize the NTDB definition for Anticoagulant Therapy, which states - Documentation in the medical record of the administration of medication (anticoagulants, antiplatelet agents, thrombin inhibitors, thrombolytic agents) that interferes with blood clotting. Present prior to injury.

Anticoagulant must be part of the patient's active medication. Exclude patients whose only anticoagulant therapy is chronic Aspirin. See the PTOS manual for examples.

E,00 –**Mental/Personality Disorder**– utilize the NTDB definition for Mental/Personality Disorder, which is defined as - (Consistent with American Psychiatric Association (APA) DSM 5, 2013) History of a diagnosis and/or treatment for the following disorder(s) documented in the patient's medical record: Schizophrenia, Bipolar Disorder, Major Depressive Disorder, Social Anxiety Disorder, Posttraumatic Stress Disorder, Antisocial Personality Disorder. Present prior to injury.

E,01 – **Attention Deficit Disorder (ADD), Attention Deficit Hyperactivity Disorder (ADHD)**
ADD is a developmental disorder, It is primarily characterized by "the co-existence of attentional problems and hyperactivity, with each behavior occurring infrequently alone" and symptoms starting before seven years of age, ADHD is the most commonly studied and diagnosed psychiatric disorder in children, affecting about 3 to 5 percent of children globally and diagnosed in about 2 to 16 percent of school aged children, It is a chronic disorder with 30 to 50 percent of those individuals diagnosed in childhood continuing to have symptoms into adulthood,

E,02 **– Intellectual Disability** –is a generalized disorder appearing before adulthood, characterized by significantly impaired cognitive functioning and deficits in two or more adaptive behaviors, It has historically been defined as an Intelligence Quotient score under 70, Once focused almost entirely on cognition, the definition now includes both a component relating to mental functioning and one relating to individuals' skills in their environment, As a result, a person with a below-average intelligence quotient (BAIQ) may not be considered intellectually disabled,

F,01 – **HIV/AIDS** – All HIV-infected individuals with CD4 counts of <200/cells/µL (or CD4 <14%) as well as those with certain HIV related conditions and symptoms, The CDC categorization of HIV/AIDS is based on the lowest documented CD4 cell and on previously diagnosed HIV-related conditions, Patients in categories A3, B3, and C1-C3 are considered to have HIV/AIDS,

F,02 – **Routine Steroid Therapy** – utilize the 2015 NTDB definition of Steroid Use which is defined as patients that required the regular administration of oral or parenteral corticosteroid medications (e.g., prednisone, dexamethasone) in the 30 days prior to injury for a chronic medical condition (e.g.,, COPD, asthma, rheumatologic disease, rheumatoid arthritis, inflammatory bowel disease,) Do not include topical corticosteroids applied to the skin or corticosteroids administered by inhalation or rectally,

F,03 – **Transplants (Major organ transplants ONLY)** – The surgical replacement of an organ that is no longer functioning with a viable functioning organ, Transplanted organs to include: heart, lung, liver, pancreas, kidney, and small bowel,

F,04 – **Active Chemotherapy** – utilize the 2015 NTDB definition of Currently receiving chemotherapy for cancer**,** which is defined as a patient who is currently receiving any chemotherapy treatment for cancer prior to injury, Chemotherapy may include, but is not restricted to, oral and parenteral treatment with chemotherapeutic agents for malignancies such as colon, breast, lung, head and neck, and gastrointestinal solid tumors as well as lymphatic and hematopoietic malignancies such as lymphoma, leukemia, and multiple myeloma. Present prior to injury.

G,02 – **Documented History Of Cirrhosis** – utilize the NTDB definition for Cirrhosis which is defined as documentation in the medical record of cirrhosis, which might also be referred to as end stage liver disease, If there is documentation of prior or present esophageal or gastric varices, portal hypertension, previous hepatic encephalopathy, or ascites with notation of liver disease, then cirrhosis should be considered present, Cirrhosis should also be considered present. A diagnosis of Cirrhosis, or documentation of Cirrhosis by diagnostic imaging studies or a laparotomy/laparoscopy, must be in the patient's medical record. Present prior to injury.

H,01 – **Undergoing Current Therapy** – Patients with a past medical history of cancer that is currently being treated (within the past 30 days) with either radiation, hormone therapy or immunotherapy,

H,02 – **Concurrent or Existence of Metastasis** – utilize the NTDB definition for Disseminated Cancer which is defined as patients who have cancer that has spread to one site or more sites in addition to the primary site, AND in whom the presence of multiple metastases indicates the cancer is widespread, fulminant, or near terminal. Other terms describing disseminated cancer include: "diffuse", "widely metastatic", "widespread", or "carcinomatosis". Common sites of metastases include major organs, (e.g., brain, lung, liver, meninges, abdomen, peritoneum, pleura, bone). A diagnosis of cancer that has spread to one or more sites must be documented in the patient's medical record. Present prior to injury.

I,01 – **Arthritis** - A form of joint disorder that involves inflammation of one or more joints, There are over 100 different forms of arthritis, The most common form, osteoarthritis (degenerative joint disease) is a result of trauma to the joint, infection of the joint, or age, Other arthritis forms are rheumatoid arthritis, psoriatic arthritis, and related autoimmune diseases,

I,02 – **Systematic Lupus Erythematosus** – A chronic inflammatory condition caused by an autoimmune disease, an autoimmune disease occurs when the body's tissues are attacked by its own immune system, Patients with lupus have unusual antibodies in their blood that are targeted against their own body tissues,

I,03 – **Osteogenesis Imperfecta (OI)** – Osteogenesis imperfecta is a genetic disorder characterized by bones that break easily, often from little or no apparent cause, Type I through Type VIII,

J,01 – **Spinal Cord Injury** – Any insult that causes temporary or permanent change in normal motor and/or sensory functions in the spinal cord of the thoracic, lumbar, or sacral segments,

J,09 – **CVA (any documented h/o CVA with residual motor or cognitive deficits)** - utilize the NTDB definition for CVA, which is defined as a history prior to injury of a cerebrovascular accident (embolic, thrombotic, or hemorrhagic) with persistent residual motor sensory or cognitive dysfunction (e.g.,, hemiplegia, hemiparesis, aphasia, sensory deficit, impaired memory). Present prior to injury. A diagnosis of CVA must be documented in the patient's medical record.

J,10 – **Autism Spectrum** – Autism spectrum disorders (ASDs) are a group of related developmental disabilities, caused by a problem with the brain, that affect a child's behavior, social, and communication skills, Autism, Asperger Syndrome, and Pervasive Developmental Disorder–Not Otherwise Specified (PDD-NOS) are the three recognized autism spectrum disorders,

J,11 – **Cerebral Palsy (CP)** – Cerebral palsy is a heterogeneous group of neuromotor conditions involving disordered movement or posture and weakness resulting from a non-progressive brain lesion, injury, or malformation occurring prenatally or in the first two (2) years of life,

J,12 – Dementia – utilize the NTDB definition for Dementia, which is defined as documentation in the patient's medical record of dementia including senile or vascular dementia (e.g.,, Alzheimer's) present prior to injury. A diagnosis of dementia must be documented in the patient's medical record.

K,00 – **Obesity** – Documented by a physician OR a BMI of 30 or greater,

L,05 - **Chronic Obstructive Pulmonary Disease (COPD) – utilize the NTDB definition for Chronic Obstructive Pulmonary Disease (COPD)** ***(Consistent with World Health Organization (WHO) 2019 2015)*** which states – **COPD is a lung disease characterized by chronic obstruction of lung airflow that interferes with normal breathing and is not fully reversible. The more familiar terms 'chronic bronchitis' and emhysema' are no longer used but are now included within the COPD diagnosis.**
Present prior to injury. A diagnosis of COPD must be documented in the patient's medical record.
Exclude patients whose only pulmonary disease is asthma. Exclude patients with diffuse interstitial fibrosis or sarcoidosis.

M,01 – **Serum Creatinine > 2 mg % (On admission)** – Patient presents with a history of renal disease and the serum creatinine level is > 2 mg% on initial admission blood work, or the serum creatinine level is > 2 mg% on initial admission blood work, but no documented history of renal disease,

M,02 – **Dialysis (excluding transplant patients)** – utilize the NTDB definition for Chronic renal failure, which is defined as acute or chronic renal failure prior to injury that was requiring periodic peritoneal dialysis, hemodialysis, hemofiltration, or hemodiafiltration. A diagnosis of Chronic Renal Failure must be documented in the patient's medical record. Present prior to injury.

N,01 –**Substance Use Disorder–** utilize the NTDB definition for Substance Use Disorder (Consistent with American Psychiatric Association (APA) DSM 5, 2013) which is defined as Descriptors documented in the patient's medical record consistent with the diagnostic criteria of substance use disorders specifically cannabis, hallucinogens, inhalants, opioids, sedative/hypnotics, and stimulants (e.g. patient has a history of drug use; patient has a history of opioid use) OR diagnosis of any of the following documented in the patient's medical record:

- Cannabis Use Disorder; Other Cannabis-Induced Disorder; Unspecified Cannabis-Related Disorder
- Phencyclidine Use Disorder; Other Hallucinogen Use Disorder; Hallucinogen Persisting Perception Disorder; Other Phencyclidine-Induced Disorder; Other Hallucinogen-Induced Disorder; Unspecified Phencyclidine-Related Disorder; Unspecified Hallucinogen-Related Disorder
- Inhalant Use Disorder; Other Inhalant-Induced Disorder; Unspecified Inhalant-Related Disorder
- Opioid Use Disorder; Other Opioid-Induced Disorder; Unspecified Opioid-Related Disorder
- Sedative, Hypnotic, or Anxiolytic Use Disorder; Other Sedative, Hypnotic, or Anxiolytic-Induced Disorder; Unspecified Sedative, Hypnotic, or Anxiolytic-Related Disorder
- Stimulant Use Disorder; Other Stimulant-Induced Disorder; Unspecified Stimulant-Related Disorder

Present prior to arrival at your center.

N,02 – **Chronic Ongoing Alcohol Abuse** - utilize the NTDB definition for Alcohol Use Disorder, (Consistent with American Psychiatric Association (APA) DSM 5, 2013.) which is defined as Descriptors documented in the medical record consistent with the diagnostic criteria of alcohol use disorder OR a Diagnosis of alcohol use disorder documented in the patient's medical record. Present prior to injury. Note: Social work, drug and alcohol counselor consults may be used to document this pre-existing condition.

N.03 – Vaping and E-Cigarette Use – Patient who reports vaping or using e-cigarettes every day or some days within the last 12 months.

P,00 – **Pregnancy** – utilize the NTDB definition of Pregnancy which is defined as Pregnancy confirmed by lab, ultrasound, or other diagnostic tool OR diagnosis of pregnancy documented in the patient's medical record. Present prior to arrival at your center.

Q,01 – **Previous history of head trauma** – Any previous injury to the brain, skull or scalp (whether open or closed), that caused anything from drowsiness to an intracranial bleed, A TBI must be clearly documented,

R,01 – **Thyroid Disease** – Thyroid disease is a medical condition impairing the function of the thyroid, Hypothyroidism (underactivity) includes Hashimoto's thyroiditis, thyroiditis, Ord's thyroiditis, postoperative hypothyroidism, postpartum thyroiditis, silent thyroiditis, acute thyroiditis, iatrogenic hypothyroidism, thyroid hormone resistance, Euthyroid sick syndrome, Hypoerthyroidism (overactivity) includes Thyroid storm, Grave's disease, Toxic thyroid nodule, Toxic nodular struma (Plummer's disease), Hashitoxicosis, Iatrogenic hyperthyroidism, De Quervain's thyroiditis (inflammation starting as hyperthyroidism, can end as hypothyroidism), If the patient is on Synthroid medication, this can be used to document thyroid disease as a pre-existing condition,

S,02 – **Current Smoker** –which is defined as a patient who reports smoking cigarettes every day or some days within the last 12 months, Excludes patients who smoke cigars or pipes or use smokeless tobacco (chewing tobacco or snuff). This matches and maps to NTDB Current Smoker.

S,03 – **Advanced Directive Limited Care** – **utilize the NTDB definition for Advance Directive Limiting Care** which states - the patient had a written request limiting life-sustaining therapy, or similar advanced directive, present prior to arrival at your center.

S,04 – **Functionally Dependent Health Status** – **utilize the NTDB definition** which states pre-injury functional status may be represented by the ability of the patient to complete age-appropriate activities of daily living (ADL) including: bathing, feeding, dressing, toileting, and walking. Include patients whom prior to injury, and as a result of cognitive or physical limitations relating to a pre-existing medical condition, was partially dependent or completely dependent upon equipment, devices or another person to complete some or all activities of daily living. Present prior to injury.

S,06 – **Peripheral Arterial Disease** - **Utilize the NTDB definition** - (Consistent with Centers for Disease Control, 2014 Fact Sheet) The narrowing or blockage of the vessels that carry blood from the heart to the legs, present prior to injury, It is primarily caused by the buildup of fatty plaque in the arteries, which is called atherosclerosis, PAD can occur in any blood vessel, but it is more common in the legs than the arms, A diagnosis of PAD must be documented in the patient's medical record,

S,07 – **Prematurity ––Utilize the NTDB definition**, defined as Babies born before 37 weeks of pregnancy are completed. Present prior to injury. A diagnosis of Prematurity, or delivery before 37 weeks of pregnancy are completed, must be documented in the patient's medical record.

S,08 – **Pre-hospital cardiac arrest with CPR** – A patient who experienced a sudden cessation of cardiac activity. The patient was unresponsive with no normal breathing and no signs of circulation. The event must have occurred outside of the index hospital. Pre-hospital cardiac arrest could occur at a transferring institution. Any component of basic and/or advanced cardiac life support must have been initiated.

**If this pre-existing condition is selected, it will map to a 'yes' response to the NTDB element 'Pre-hospital Cardiac Arrest,' If this pre-existing condition is not selected, it will map to a response of 'no' to the NTDB element 'Pre-hospital Cardiac Arrest,'

S,09 – **Angina Pectoris** – Utilize the NTDB Definition for Angina Pectoris which states- (Consistent with the American Heart Association (AHA), May 2015) Chest pain or discomfort due to Coronary Heart Disease, present prior to injury, Usually causes uncomfortable pressure, fullness, squeezing or pain in the center of the chest, Patient may also feel the discomfort in the neck, jaw, shoulder, back or arm, Symptoms may be different in women than men, A diagnosis of Angina or Chest Pain must be documented in the patient's medical record,

T,00 – **Congenital Disorder -** Utilize the 2015 NTDB definition for Congenital Anomalies, which is defined as documentation of a cardiac, pulmonary, body wall, CNS/spinal, GI, renal, orthopaedic, or metabolic congenital anomaly. Present prior to injury. A diagnosis of a Congenital Anomaly must be documented in the patient's medical record.

*** = Unknown – It is best to choose unknown for pre-existing conditions from the pre-existing conditions drop down menu, To manually enter unknown, the asterisk must be used, The asterisk is entered by using the shift and the 8 key on your keyboard, When printing a report the asterisk will be replaced by "unk" automatically,**

Process/System Issues Menu

20010, Ambulance scene time > 20 minutes

20020, Missing EMS report or prehospital data for pt transp by EMS from scene

20031, Pt w/ GCS < 13 who does not receive a CT of the head within 2 hrs of arrival

20041, [Optional] Absence of neuro doc on ED of trauma pt w/ diag of skull fx or intracranial injury

20042, [Optional] Absence of neuro doc on ED of trauma pt w/ diag of spinal cord injury

20050, [Optional] Absence of at least hrly doc of BP, pulse, and resp for any pt in resus area

20060, GCS <= 8 and no endotracheal tube or surgical airway performed in resus area

20080, Non-operative treatment of gunshot wound to abdomen

20090, Delay in performing laparotomy/laparoscopy (from > 2 hrs after admission)

20100, Pt w/ edh or sdh recv init craniotomy > 4 hrs after arrival, excl ICP

20111, Pt transferred IN after 3 hrs at initial hospital

20112, Pt transferred OUT after 3 hrs from ED arrival

20130, Abdominal, thoracic, vascular, or cranial surgery after 24 hours

20151, Pt admitted to hospital under care of physician who is not a surgeon

20152, Burn pt with inhalation injury not admitted to burn or pulmonary service

20160, Nonfixation of femoral diaphyseal (shaft) fracture in adult trauma patient

20180, Pt req unplanned reintubation w/in 48 hrs of extubation

20200, Pt w/ c-spine fx, subluxation, or neuro deficit not addressed on admission

20230, Burn pt w/ inhalation injury and not intubated

21001, Pt w/ open fx of long bones blunt inj recv surgery > 24 hrs after ED arrival

21002, Left ED with tourniquet and destination not OR, inter angiography, IR, morgue

21003, Need for Trauma Intervention (NFTI)

Process/System Issues Definitions

Definitions of the audit filters provided in your **COLLECTOR** version are given on the following pages, Please note: The Audit Filters defined below no longer match ACS and JCAHO filters. The World Health Organization's (WHO) suggested potential audit filters listed in the "Guidelines for Trauma Quality Improvement Programmes" (2009) were used as a reference.

- Field scene time > 20 minutes (**Audit Filter #1**)

  Trauma Patient; AND

  Transport from Scene (SCENE_TRANSP) = 1 (Ambulance), 2 (Helicopter), 3 (Ambulance/Helicopter) or 5 (Fire Rescue); AND

  Arrive at Scene Time (SCENE_ARRIVE_TIME) to Leave Scene Time (SCENE_LEAVE_TIME) > 20 minutes,

  If the response to "Were scene provider and transport provider the same?" is a 1 (yes) then just the Scene Section Arrive and Leave dates and times are used to calculate the time,

  If the response to "Were scene provider and transport provider the same?" is a 2 (no) then the earliest Arrive date and time in either the Scene or Transport section and the Leave date and time in the Transport section are used to calculate the time,

  Interhospital times are not utilized,

- Absence of ambulance report on medical record for patient transported by EMS from scene (**Audit Filter #2**)

  Transport from Scene (SCENE_TRANSP) = 1 (Ambulance), 2 (Helicopter), 3 (Ambulance/Helicopter) or 5 (Fire Rescue); AND

  Patient Care Record in Patient Medical Record from Scene (SCENE_RUN_FORM) = 2 (No),

  If the response to "Were scene provider and transport provider the same?" is a 1 (yes) then just the Scene Section "Patient Care Record in Medical Record" is used to determine the absence,

  If the response to "Were scene provider and transport provider the same?" is a 2 (no) then just the Transport Section "Patient Care Record in Medical Record" is used to determine the absence,

  The Interhospital Section is not utilized,

Patient with admission Glasgow Coma Scale score <13 and no head computerized tomography (CT) scan within 2 hours of arrival at hospital excluding DOAs (**Audit Filter #3a**)

Trauma Patient; AND

Signs of Life (SIGN_LIFE) = 2 (Arrived with Signs of Life)

GCS on Admission (GCS_A) < 13; AND

No referring facility ICD 10 diagnostic intervention code that starts with BW2[89]

No hospital ICD 10 procedure code that starts with BW2[89] with an associated start time ≤ 2 hours of arrival time

Note: This filter will only trigger to OUTCOMES for patients with EDA Date >= 2018. That date cutoff will be built into the OUTCOMES interface.

- Absence of sequential neurological documentation on emergency department record of trauma patient with a diagnosis of skull fracture or intracranial injury (**Audit Filter #4a**) [Optional audit filter, no longer transmitted to Central Site, 2022]

  Trauma Patient; AND

  Any ICD-10-CM diagnosis code (ICD10_01, ICD10_02, ,,, ICD10_27) that starts with S02,0, S02,1, S04, S06, S07,1; AND

  "Is there sequential neurological documentation on ED record of trauma patient with admission diagnosis of skull fx, intracranial injury, or spinal cord injury?"
  (NURS_N_DOC) = 2 (No),

- Absence of sequential neurological documentation on emergency department record of trauma patient with a diagnosis of spinal cord injury (**Audit Filter #4b**) [Optional audit filter, no longer transmitted to Central Site, 2022]

  Trauma Patient; AND

  Any ICD-10-CM diagnosis code (ICD10_01, ICD10_02, ,,, ICD10_27) that starts with S14,0, S14,1, S24,0, S24,1, S34,0, S34,1, S34,3; AND

  "Is there sequential neurological documentation on ED record of trauma patient with admission diagnosis of skull fx, intracranial injury, or spinal cord injury?" (NURS_N_DOC) = 2 (No),

- Absence of at least hourly determination and recording of blood pressure, pulse, and respirations measurements for a trauma patient, beginning with arrival in the resuscitation area and including time spent in radiology up to admission ~~to the operating room or ICU,~~ death, or transfer to another hospital (**Audit Filter #5**)*[Optional audit filter, no longer transmitted to Central Site, 2022]

  "Is there hourly documentation beginning with ED arrival?" (NURS_DOC_S) = 2 (No),

  Glasgow Coma Scale score of ≤ 8 and no endotracheal tube or surgical airway performed before leaving the resuscitation area (**Audit Filter #6**)

Trauma Patient; AND

Post ED Destination (POST_ED_D) ≠ 6 (Morgue); AND

"Did patient leave ED with a discharge GCS ≤ 8?" (ED_GCS_8) = 1 (Yes); AND

"If yes, did patient leave ED with definitive airway?" (ED_AIRWAY) = 2 (No),

- Non-operative treatment of gunshot wound to the abdomen." (**Audit Filter #8**)

Trauma Patient; AND

"Did patient sustain a gunshot wound to the abdomen and receive non-operative management?" (NONOP_GSWA) = 1 (Yes),

Delay in performing laparotomy/laparoscopy (from greater than 2 hours after admission) (**Audit Filter #9**)

Trauma Patient; AND

"Did patient require a laparotomy that was not performed within 2 hours of ED arrival?" (LAPAROT) = 1 (Yes),

- Patient with epidural or subdural brain hematoma receiving initial craniotomy > 4 hours after arrival at ED, excluding those performed for ICP monitoring (**Audit Filter #10**)

Trauma Patient; **AND**

Any ICD-10-CM diagnosis code (ICD10_01, ICD10_02, ,,, ICD10_27) that starts with S06,4; OR S06,5; **AND**

"Did the patient have a craniotomy for trauma?" (CRANIOTOMY) = 1 (Yes); **AND**

Any Operative procedure (PR_01_I10,,,PR_84_I10) = that starts with 0N [8,9,B,R,T,U] [0,1,2,3,4,5,6,7,8,C,D,F,G,]0 **OR** 00[8,9,B,C,Q] [0,1,2,3,4,5,6,7,8,9,A,B,C,D]0; **AND**

the associated time for the earliest (initial qualifying Operative procedure (e,g,, O_1_P1_DATE, O_1_P1_TIME) is greater than 4 hours after ED arrival (EDA_DATE, EDA_TIME),

- Patient transferred in after 3 hours at initial hospital (**Audit Filter #11a**)

"Is this a transfer patient?" (TRANSF_PT) = 1 (Yes); AND

Time from Arrival at Referring Hospital (DATE_REF_AR, TIME_REF_AR) to Departure from Referring Hospital > 3 hours (DATE_REF_DP, TIME_REF_DP)

AND

Patient injury date/time (INJ_EVENT) < 24 hours prior to Time of arrival at Referring Hospital (DATE_REF_AR, TIME_REF_AR)
AND
Injury Date to Referring Facility Arrival Date is ≤ to 2 days
Note: Patients with an injury date/time > 24 hours prior to arrival at the Referring Facility will be excluded

- Patient transferred out after 3 hours from ED arrival (**Audit Filter #11b**)

  Discharge Status (DIS_STATUS) = 6 (Survivor); AND

  Discharge Destination (DISCG_TO) = 2 (Other Hospital), 3 (Trauma Center), 6 (Burn Center), 14 (Pennsylvania Trauma Center) or 15 (Out of State Trauma Center) AND

  Time from ED Arrival (EDA_DATE, EDA_TIME) to Discharge (D_C_DATE, D_C_TIME) > 3 hours,

- Abdominal, thoracic, vascular or cranial surgery after 24 hours (**Audit Filter #13**)
  Trauma Patient; AND

  "Abdominal Surgery > 24 Hours" (ABD_GT_24) = 1 (Yes); OR

  "Intrathoracic Surgery > 24 Hours" (THOR_GT_24) = 1 (Yes); OR

  "Vascular Surgery > 24 Hours" (VASC_GT_24) = 1 (Yes); OR

  "Cranial Surgery > 24 Hours" (CRAN_GT_24) = 1 (Yes),

- Trauma patient admitted to hospital under care of admitting or attending physician who is not a surgeon (**Audit Filter #15a**)

  Trauma Patient; AND

  Admitting Service (ADM_SERV) = 6 (Other Non-Surgical)

- Burn patient with inhalation injury not admitted to burn or pulmonary service (**Audit Filter #15b**)

  Burn Patient; AND

  Any Predot codes = 419200.2, 419201.2, 419202.3, 419204.4, 419206.5, 419208.6; AND

  Not Admitted to Burn Service (ADM_SERV ≠ 9) or Pulmonary (ADM_SRV_NS ≠ "Pulmonary")

- Non-fixation of femoral diaphyseal (shaft) fracture in adult trauma patient excluding DOAS (**Audit Filter #16**)

Trauma Patient; **AND**

Signs of Life (SIGN_LIFE) = 2 (Arrived with Signs of Life)

Derived Age (AGE) ≥ 15; **AND**

Any ICD-10-CM diagnosis code (ICD10_01, ICD10_02, ,,, ICD10_27) that starts with S72,3; **AND**

NO Procedure that starts with (PR_01_I10,,,PR_84_I10 OQS [6,7,8,9,B,C] [0,3,4]_[4,5,6,B,C,D]OR starts with OQH[6,7,8,9,B,C]

- Any patient requiring reintubation within 48 hours of extubation (**Audit Filter #18**)

"Was reintubation required within 48 hours of extubation?" (REINTUBAT) = 1 (Yes),

- All Hospital Events (**Audit Filter #19**)

Any Hospital events (COMPLIC_1, COMPLIC_2, ... COMPLIC_10) valued and ≠ 01 (None).

- Patient with diagnosis at discharge of cervical spine fracture, subluxation, or neuro deficit not addressed on admission excluding DOAs (**Audit Filter #20**)

Trauma Patient; AND

Signs of Life (SIGN_LIFE) = 2 (Arrived with Signs of Life) AND

"Did patient have discharge diagnosis of cervical spine fracture, subluxation, or neuro deficit not addressed on admission?" (MISSED_CS) = 1 (Yes),

All trauma deaths (particularly can focus on unexpected deaths such as those occurring with low injury severity scores) (**Audit Filter #21**)

Discharge Status (DIS_STATUS) = 7 (Dead)

- Burn patient with inhalation injury and not intubated (**Audit Filter #23**)

Burn Patient; AND

Any Predot codes = 419200,2, 419201,2, 419202,3, 419204,4, 419206,5, 419208,6; AND

Intubated with Artificial Airway (INTUBAT_A) ≠ 1 (Yes); AND

NO Procedure (PR_01_I10,,,PR_84_I10) = 0BH10DZ, 0BH13EZ, 0BH14DZ, 0BH17DZ, OBH17EZ, 0BH18DZ, 0BH18EZ, 0DH57BZ, 0CHY7BZ, 0CHY8BZ AND Procedure Location = ED; **OR** Procedure Start Date/Time within ED Stay

- Trauma patient with open fractures of long bones as a result of blunt trauma receiving initial surgical treatment > 24 hours after ED arrival (**Audit Filter A**)*

  Trauma Patient; **AND**

  Type of Injury (INJ_TYPE) = 1 (Blunt); **AND**

  Any ICD-10-CM diagnosis code (ICD10_01, ICD10_02, ... ICD10_27) S42.[2,3,4]__B or S52.___[B,C] or S72.___[B,C] or S82.[1,2,3,4,5,6]__[B,C] or S82.8[3,4,5,6,7]_[B,C]; **AND**

  Any Operative procedure (PR_01_I10...PR_84_I10) that starts with 0P[H,N,Q,R,S,U][C,D,F,G,H,J,K,L][0,3,4] or 0Q[H,N,Q,R,S,U][6,7,8,9,B,C,G,H,J,K][0,3,4]; **AND**

  the associated time for the earliest (initial) qualifying Operative procedure (e.g., PROC_01_DATE, PROC_01_TIME) is greater than 24 hours after ED arrival (EDA_DATE, EDA_TIME).

  Note: This filter will only trigger to Outcomes for patients with EDA Date >= 2018. That date cutoff will be built into the Outcomes interface.

• "Patient left the ED with a tourniquet and destination not operating room (OR), Interventional Angiography/Interventional Radiology (IR) or morgue." (Audit Filter B)

  Trauma Patient; AND

  Tourniquet Use = Yes; AND

  Post ED Destination is filled in with a value and is not equal 2, (OR) , 11 (Interventional Angiography), or 6 (Morgue); AND

  Any Tourniquet with
  o Tourniquet Placed = any of 1 (Prehospital), 2, (Outside Hospital), 3, Interhospital Transport) or with Tourniquet Placed = 4 (In-house) and Tourniquet Placed time <= Transported to Post ED Destination time; AND

  o Tourniquet Removed is not equal any of 1 (Prehospital), 2 (Outside Hospital), 3 (Interhospital Transport), 4 (ED)

- "Need for Trauma Intervention" (NFTI) – (**Audit Filter C**)

  Primary or Secondary Injury Type (INJ_TYPE) = 1 (Blunt) or 2 (Penetrating);
  Patient is not a direct admit
  AND

  Any record with no alert called OR that is not a highest-level alert (Initial level of alert OR Level of alert upgrade ≠ 1)

AND any one of the following criteria:

a. Blood transfusion within 4 hours of arrival *(any value > 0 in whole blood or packed red blood cells)* **OR**
b. Discharge from ED to OR within 90 minutes of arrival **OR**
c. Discharge from ED to interventional radiology (IR) **OR**
d. Discharge from ED to ICU AND ICU length of stay at least 3 days **OR**
e. Mechanical ventilation during the first 3 days, excluding anesthesia *(procedure code 5A19_5Z)* **OR**
f. Death within 60 hours of arrival

Note: This filter will only trigger for patients with EDA Date >= 2021.

Appendix B: Definitions of Factors – Human/Practitioners

FHC01, **Skill-Based** – Skill-based actions are when an individual is in "auto-pilot" mode.

- The action is routine behavior that requires low commitment and reasoning is unconscious, automatic.
- The person reacts to the stimulus almost instantaneously performing an action related to a procedure well internalized.
- Skill-based errors tend to occur during highly routine activities, when attention is diverted from a task, either by thoughts or external influences.
- The individual has the right knowledge, skills, and experience to do the task properly, and has performed the action correctly many times before, but may have been interrupted.
- An example of this is unintentional omission of temperature in a trauma activation due to interruption to perform a different task.

FHS02, **Rule-Based** – Rule-based actions are when an individual is on "if-then response" mode.

- The person identifies the situation and applies an appropriate rule to it. Examples of rules are tasks, procedures, or other responses to a recognized situation.
- The cognitive engagement is higher and implies a certain reasoning.
- Rule-based errors are typically due to choosing of the wrong rule due to an erroneous perception of the situation, or omissions in the application of a rule.
- An example of this is unintentional deviation from a practice management guideline or implementing the incorrect practice management guideline.

FHC03, **Knowledge-Based** – Knowledge-based actions are when an individual is on "figure it out" mode.

- The situation and behavior are new, unfamiliar, or infrequently encountered by the individual.
- The person must react creatively and independently, without the use of procedures or instinctive behaviors.
- Knowledge-based errors are typically due to lack of knowledge or incorrect application of a newly learned procedure.

FHC04, **Unclassifiable** – The event cannot be classified in any of the other categories within the Human-Practitioner factors

FHC05, **Negligence** – An event/issue that occurs due to care that falls below the standards reasonably expected of an average physician qualified to take care of the patient in question.

FHC06, **Recklessness** – An event/issue that is a direct result of a behavioral choice by the individually where they consciously disregarded a rule and took a substantial and unjustifiable risk.

FHC07, **Intentional Rule Violations** - A deliberate deviation from an accepted protocol or standard of care.

- The individual chose not to follow a rule.
- The violations may have been well-intentioned, targeting desirable outcomes but the intended reaction was not achieved.
- Some violations may involve acts of sabotage designed to cause damage.

Appendix C: Calculation of RTS

To calculate Revised Trauma Score (RTS), three weighted values are used: Glasgow Coma Scale (GCS) = ,9368, Systolic Blood Pressure (SBP) = ,7326 and Respiratory Rate (RR) = ,2908,

GCS	SBP	RR	Coded Value
13-15	> 89	>29	4
9-12	76-89	10-29	3
6-8	50-75	6-9	2
4-5	1-49	1-5	1
3	0	0	0

Coded values are defined and used to calculate RTS,
Using the following example, calculate RTS,

	Raw Value	Coded Value
GCS	8	2
SBP	120	4
RR	30	3

RTS = (2)(,9368) = (4)(,7326) + (3)(,2908)
RTS = 5,6764
The above methodology is a calculated RTS. This will vary from the field RTS described by EMS, The range for the EMS field RTS will range from 0 to 12, The range for a calculated RTS is 0 to 7,8408,

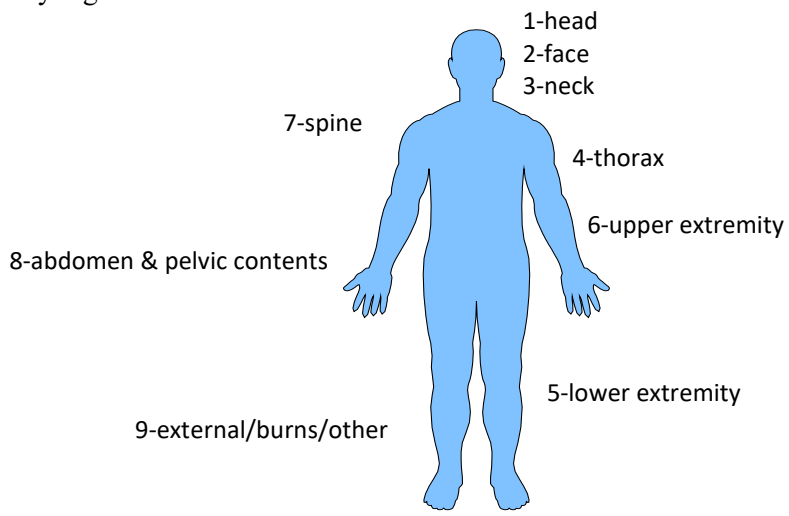
Appendix D: AIS and ISS

Abbreviated Injury Score (AIS) Classifications

- 1 = minor; skin abrasion
- 2 = moderate; open fracture nose
- 3 = serious; fracture femur
- 4 = severe; intimal tear, abdominal aorta
- 5 = critical; complete cord syndrome, quad
- 6 = Maximal (currently untreatable); crush injury chest (if a 6 is assigned, the ISS is an automatic 75)
- 9 = unspecified; blunt abdominal trauma

AIS-2005 (Update 208) Body Regions

There are 9 body regions:



Injury Severity Score (ISS) Calculation

ISS ranges from 1 to 75. To calculate take the 3 highest injured body regions, square the highest score in each of those 3 identified regions, and then add those 3 numbers to get an ISS Score.

$$A^2 + B^2 + C^2 = ISS$$

$$\square^2 + \square^2 + \square^2 = \square$$

Appendix E: Caveats to Using Pa v5 Outcomes

There are cases in which a user can experience problems with using the Pa v5 Outcomes software:

1. The user bypasses data checks and closes a case in Pa v5 Outcomes while the case is active in the trauma registry. Make certain that the case is closed out in the trauma registry before the case is run through the data checks and closed out in OUTCOMES. You cannot close a case in OUTCOMES while it is active in Collector. You receive an error message that does not let you proceed.
2. The user deletes or renumbers a case in the trauma registry, the link between the case in the trauma registry and the case in Pa v5 Outcomes is broken. Any deletions on the registry side should be deleted in the Pa v5 Outcomes user ***prior*** to deletion. Any change of record to nonPTOS should be updated through both the registry and Outcomes prior to reporting to the Central Site. *It is strongly recommended to not reuse numbers*. If they are reassigned, there may be duplicate records in Pa v5 Outcomes.
3. Copy and paste into either the Collector registry or the OUTCOMES module can cause multiple issues. Formatting or unusual characters/punctuation may result from text copied and pasted into registry fields. This will cause the interface to fail. Records will not interface until those fields are identified and corrected. Special characters copied and pasted into either the Collector registry fields or directly into Pa v5 Outcomes from other sources, such as Word, are not supported and will be converted to underscores or other unusual characters when the record is saved. For example, ¼ will be converted to _ . (This does not include external files,) Avoid using special characters, such as certain fractions, bullets, arrows, etc, Quotation marks will affect report writing abilities, It is recommended that users of the Pa v5 Outcomes software avoid entering the following list of characters in memo fields in the Pa v5 Outcomes software. These characters can result in reporting issues when used in Pa v5 Outcomes reports:

Character	Name	Replace with:
<	Less than	less than
>	Greater than	greater than
<=, ≤	Less than or equal to	, let than or equal to
>=, ≥	Greater than or equal to	greater than or equal to
≠	Not equal to	not equal to
÷, ×	Divide and multiply	/ for divide and * for multiply
“	Double quote	‘ (Single quote/Apostrophe)
`	Forward leaning quote	‘ (Single quote/Apostrophe)
©, ®, ™	Copyright/Registered/Trademark	(C), (R), (TM)
½, ¼	Half, Quarter	1/2, 1/4
◦	Degree	Use F/C without the degree symbol
§¶	Section Mark/Paragraph Mark	Remove these characters

NOTE: This list includes only the most common characters in text, The use of other special characters normally not found in narrative are also discouraged, Examples include: π, €,↓,→,↑,Σ,∫,≈,≡,Δ,∂