

Introduction

The Data Report is a quarterly report produced by the Kansas Trauma Registry and distributed quarterly to Trauma Registry Primary Contacts. The report is meant to be a tool for comparing your institution's case mix and performance on several standard trauma care indicators with your region and with the state overall. The indicators are derived from suggested audit filters published by the American College of Surgeons and other sources and have been evaluated by the Kansas Trauma Registry Subcommittee of the Advisory Committee on Trauma. We anticipate that the indicators will change and evolve as we identify specific issues in the Kansas Trauma System and begin to implement systems for performance improvement.

This document describes the specific rules for determining the counts presented in the report. First, a qualification query determines which records to evaluate. For example, a "time to transfer" indicator would include only patients who were transferred, and are not missing data crucial to determining whether the case is an outlier. Outliers are determined in a second query. Finally, a third query identifies those cases that could not be evaluated because of missing data.

If a case is determined to be an outlier, it does NOT necessarily indicate a failure to meet standards of care—only that the record may be worthy of review by clinical staff to support performance improvement. Each case must be considered in light of the patient's unique circumstances.

Case Mix

Age, gender and injury type (blunt, penetrating, burn, drowning) are based on those fields entered into the registry.

Outgoing transfers are identified based on the field DIS_TO. Acute transfers are indicated by DIS_TO = 7, "Other Acute Care Facility".

Incoming transfers are identified based on the field ARR_FROM. Acute transfers are indicated by ARR_FROM = 3, "Arrived from referring facility".

External Cause categories are derived from the suggest groupings from the National Center from Injury Prevention and Control.

(<http://www.cdc.gov/ncipc/whatsnew/matrix2.htm>)

Category	E-codes
Motor Vehicle Crash	E810-E819; E958.5; E968.5; E988.5
Fall	E880-E886; E888; E957; E968.1; E987
Other	Any other E-code

Transfers

For all transferred patients, elapsed time between emergency department arrival and discharge to another acute care facility does not exceed 6 hours.

Conditions

1. Qualify (B_TEST_QUAL_TXS_FLOW)

The case was transferred acutely and ED arrival and discharge times were recorded. If times were not recorded, but the date of discharge was 2 days or more after the date of ED arrival, the case qualifies and is considered an outlier.

2. Outlier (B_TEST_FAIL_TXS_FLOW)

The case is an outlier if the time between ED arrival and discharge exceeded 6 hours. The case is also considered an outlier if ED arrival or discharge times were not recorded, but the date of discharge was 2 days or more after the date of ED arrival.

3. Missing (B_TEST_MISS_TXS_FLOW)

Qualification could not be determined because either (1) the case was discharged alive but it is impossible to determine if the case was a transfer or (2) the case was a transfer, but arrival and discharge times were not recorded.

Unstable Transfers

For transfers with Initial Systolic Blood Pressure < 90 or Glasgow Coma Score \leq 8, elapsed time between emergency department arrival and discharge to another acute care facility does not exceed 1 hour.

Conditions

1. Qualify (B_TEST_QUAL_SEVERE)

The case was transferred acutely with either SBP < 90 or GCS \leq 8 and ED arrival and discharge times were recorded. If times were not recorded, but the date of discharge is 2 days or more after the date of ED arrival, the case qualifies and is considered an outlier.

2. Outlier (B_TEST_FAIL_SEVERE)

The case is an outlier if the time between ED arrival and discharge exceeded 60 minutes. The case is also considered an outlier if ED arrival or discharge times were not recorded, but the date of discharge was 2 days or more after the date of ED arrival.

3. Missing (B_TEST_MISS_SEVERE)

Qualification could not be determined for one of the following reasons: (1) discharge location was left blank, (2) outgoing transfer was indicated but SBP was missing, (3) outgoing transfer was indicated but GCS was missing, (4) discharge location not valued even though the patient was discharged alive, (5) the patient was transferred and had SBP < 90 or GCS \leq 8, but ED arrival and discharge times were not recorded.

Airway

A definitive airway will be established before transfer of a comatose patient ($GCS \leq 8$). Definitive airways include: LMA, Combitube, oral endotracheal tube, nasal endotracheal tube, tracheostomy/cricothyroidotomy.

Conditions

1. Qualify (B_TEST_QUAL_AIRWAY)

The case was transferred-out acutely with $GCS \leq 8$ and either the AIRWAY field is valued or at least one procedure code is valued.

2. Outlier (B_TEST_FAIL_AIRWAY)

The case is an outlier if it qualifies and both (1) a definitive airway was not indicated in the AIRWAY field and (2) no procedure codes for definitive airways were given. Acceptable ICD-9-CM procedure codes include 31.1 (temporary tracheostomy) and 96.04 (insertion of endotracheal tube).

3. Missing (B_TEST_MISS_AIRWAY)

Qualification could not be determined for one of the following reasons: (1) the case was discharged alive with $GCS \leq 8$ but transfer status could not be determined, (2) the case was discharged alive with $GCS \leq 8$ but none of the airway fields were recorded, (3) an acute transfer was indicated, but none of the airway fields were recorded or (4) an acute transfer was indicated but GCS was not recorded.

Head Injury

Patients with suspected traumatic brain injury (moderate to severe coma, $GCS \leq 12$) are transferred to a level I or level II trauma center for treatment.

Conditions

1. Qualify (B_TEST_QUAL_TBI)

The case was transferred-out acutely with $GCS \leq 12$ and the 6-digit facility ID for the hospital to which the case was transferred was recorded. No records from facilities that are themselves verified level I or II trauma centers will qualify.

2. Outlier (B_TEST_FAIL_TBI)

The case is an outlier if the case qualifies and the 6-digit facility ID is not a verified level I or level II trauma center. The list of verified trauma centers is available from the Kansas Trauma Registry (785-296-8627 or KTR@kdhe.state.ks.us).

3. Missing (B_TEST_MISS_TBI)

Qualification could not be determined for one for one of the following reasons: (1) transfer status could not be determined, (2) an acute transfer was indicated but GCS was not recorded or (3) an acute transfer of a patient with $GCS \leq 12$ was indicated, but the 6-digit facility ID was not recorded.

Chest Tube

Patients with pneumothorax (or hemopneumothorax) receive a chest tube before transfer to another acute care facility.

Conditions

1. Qualify (B_TEST_QUAL_CHEST)

The case was transferred-out acutely, had pneumothorax (ICD-9-CM 860.0-860.1) or hemopneumothorax (860.4-860.5) and at least one procedure was reported or marked “inappropriate”.

2. Outlier (B_TEST_FAIL_CHEST)

The case is an outlier if does not contain an appropriate procedure code (34.0).

3. Missing (B_TEST_MISS_CHEST)

Qualification could not be determined for one of the following reasons: (1) the case had pneumothorax or hemopneumothorax but discharge status could not be determined, (2) the case had pneumothorax or hemopneumothorax but procedures were left blank or marked unknown, (3) the case was a transfer but diagnoses were not reported, (4) the case was a transfer but no procedures were reported or marked inappropriate or (5) chest tube procedures were reported, but it was impossible to determine either diagnosis or discharge status.

On Time

Trauma surgeon response is timely.

Conditions

1. Qualify (B_TEST_QUAL_ONTIME)

The case qualifies if the trauma surgeon timeliness question was recorded.

2. Outlier (B_TEST_FAIL_ONTIME)

The case is an outlier if the question was answered in the negative.

3. Missing (B_TEST_MISS_ONTIME)

Qualification could not be determined if the question was left blank or marked “Unknown”. If marked “Inappropriate”, the case does not qualify but is not regarded as missing.

Open Fractures

Open fractures undergo debridement within 8 hours of ED arrival. Excludes patients who were discharged or who died within 8 hours of ED arrival.

Conditions

1. Qualify (B_TEST_QUAL_OPENFX)

The case has an open fracture (see Open Fracture Codes table below), was not discharged and did not die within 8 hours, ED arrival time was recorded and at least on procedure start time was reported.

2. Outlier (B_TEST_FAIL_OPENFX)

The case is an outlier if a procedure code for debridement (79.6, debridement of open fracture site; 86.22, excisional wound debridement; 86.28, non-excisional wound debridement) is not recorded or did not occur within 8 hours of ED arrival. If fracture undergoes reduction within that time period but debridement was not indicated the case is not considered an outlier.

3. Missing (B_TEST_MISS_OPENFX)

Qualification could not be determined if the case had an open fracture, but either no procedure codes or procedure start times were recorded.

Open Fracture Codes

Code range*	Fracture
812 -.1, -.3, -.5	humerus
813 -.1, -.3, -.5, -.9	radius & ulna
814.1	carpal bones
815.1	metacarpal bones
816.1	phalanges of hand
817.1	multiple hand bones
818.1	ill-defined, upper limb
819.1	multiple, involving both upper limbs, and upper limb with rib(s) and sternum
820 -.1, -.3, -.9	femoral neck
821 -.1, -.3	other/unspecified femur
822.1	patella
823 -.1, -.3, -.9	tibia & fibula
824 -.1, -.3, -.5, -.7, -.9	ankle
825 -.1, -.3	tarsal/metatarsal
826.1	phalanges of foot
827.1	other, multiple, and ill-defined fractures of lower limb
828.1	multiple fractures involving both lower limbs, lower with upper limb, and lower limb(s) with rib(s) and sternum

* Unless indicated otherwise, all 5th digit values are counted

Dislocation

Patients with hip, knee, shoulder, elbow or ankle dislocation receive reduction within 6 hours of ED arrival. Excludes patients who died or who were discharged within 6 hours of ED arrival.

Conditions

1. Qualify (B_TEST_QUAL_DISLOC)

The case has a dislocation (see Dislocation Codes table below), ED arrival and at least one procedure and procedure start time are reported, and the case was not discharged within 6 hours.

Dislocation Codes

Code range	Dislocation
831	shoulder
832	elbow
835	hip
836	knee
837	ankle

2. Outlier (B_TEST_FAIL_DISLOC)

The case is an outlier if either did not undergo reduction (ICD-9-CM procedure category 79) or underwent reduction after 6 hours from ED arrival.

3. Missing (B_TEST_MISS_DISLOC)

Qualification could not be determined for a dislocation patient because either no procedures were reported, or ED arrival or procedure start times were not recorded.

Non-Operative Management of Low-Grade Spleen Injuries

Patients with low-grade splenic laceration, AIS ≤ 3 , do not undergo splenectomy.

Conditions

1. Qualify (B_TEST_QUAL_SPLEEN)

The case has a low-grade spleen injury (AIS-90 predot codes 544299, 544210, 544212, 544220, 544222) and at least one procedure code is recorded or all procedures are marked “Inappropriate”.

2. Outlier (B_TEST_FAIL_SPLEEN)

The case is an outlier if a splenectomy (ICD-9 procedure codes 41.2, 41.5) was performed.

3. Missing (B_TEST_MISS_SPLEEN)

Qualification could not be determined for a patient with a low-grade spleen injury if all procedures were either left blank or marked “Unknown”.

Hypovolemic

Patients with penetrating abdominal injury and SBP \leq 90 mmHg undergo laparotomy within 60 minutes of ED arrival.

Conditions

1. Qualify (B_TEST_QUAL_HYPOV)

The case has a penetrating abdominal injury, SBP \leq 90 mmHg (taken in ED), ED arrival time is recorded and at least on procedure is reported.

2. Outlier (B_TEST_FAIL_HYPOV)

The case is an outlier if either laparotomy is not recorded or occurred more than 60 minutes after ED arrival.

3. Missing (B_TEST_MISS_HYPOV)

Qualification could not be determined for one of the following reasons: (1) injury type (blunt/penetrating) is not recorded, (2) SBP is not recorded, (3) patient is hypovolemic with a penetrating injury, but ED arrival or procedure start times are not recorded.

Documentation

Glasgow Coma Scale

Numerator: GCS measured in the ED is reported “Inappropriate”, “Unknown” or left blank. Denominator: All records.

Injury Date & Time

Numerator: Injury date and time are reported “Inappropriate”, “Unknown” or left blank. Denominator: All records.

Respiratory Rate

Numerator: Respiratory rate measured in the ED is reported “Inappropriate”, “Unknown” or left blank. Denominator: All records.

Systolic Blood Pressure

Numerator: SBP taken in the ED is reported “Inappropriate”, “Unknown” or left blank. Denominator: All records.

Temperature

Numerator: Body temperature taken in the ED is reported “Inappropriate”, “Unknown” or left blank. Denominator: All records.

Procedure Start Time (for any procedure)

Numerator: Procedure start times are all reported “unknown” or left blank. Denominator: All records with at least one procedure code.

Discharge Date & Time

Numerator: Discharge date and time are reported “Inappropriate”, “Unknown” or left blank. Denominator: All records.