The revised Utstein Template for Uniform Reporting of Data following Major Trauma

User manual

Scandinavian Networking Group for Trauma and Emergency Management (SCANTEM)

The Trauma Audit & Research Network (TARN), UK

Trauma Registry of the German Society of Surgery (DGU-TR)

Italian National Registry of Major Injuries (RITG)

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Layout: Kjetil G. Ringdal

For further information, including updates see:

http://www.scantem.org/

https://www.tarn.ac.uk/

http://www.traumaregister.de/de/index.htm

http://www.pprg.infoteca.it/ritg/

Comments and observations by users are welcome, and can be posted to kjetil.ringdal@snla.no

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Acknowledgement

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Abbreviations

AIS = Abbreviated Injury Scale
ASA-PS = American Society of Anestesiology Physical Status
BE = Base Excess
BiPAP = Biphasic Positive Airway Pressure
CCU = Critical Care Unit
CPAP = Continuous Positive Airway Pressure
CT = Computed Tomography
ED = Emergency Department
EI = Emergency Intervention
EMS = Emergency Medical Services
EMT = Emergency Medical Technician
GCS = Glasgow Coma Scale
GOS = Glasgow Outcome Scale
HEMS = Helicopter Emergency Medical Services
HDU = High Dependency Unit
ICU = Intensive Care Unit
INR = International Normalized Ratio
ISS = Injury Severity Score
ITU = Intensive Therapy/Treatment Unit
NISS = New Injury Severity Score
OR = Operating Room
RR = Respiratory Rate
RTS = Revised Trauma Score
SBP = Systolic Blood Pressure
TRISS = Trauma and Injury Severity Score

Foreword

The precise definition of data points in a trauma registry might seem a rather esoteric subject. However, in order to evaluate outcomes in any medical condition a 'like for like' comparison must be made. The various European trauma registries are at different stages of development, use different prediction models, and have different structures, but they are united by the common desire to improve trauma care by audit of process and outcomes.

During 2007, an expert panel consisting of representatives from major trauma organisations in Europe and Scandinavian joined a process to create a European standard for documenting and reporting data following major trauma. The Scandinavian Networking Group for Trauma and Emergency Management (SCANTEM), the European Trauma Audit & Research Network (EuroTARN), the Trauma Registry of the German Society of Trauma Surgery (DGU-TR), and the Italian National Registry of Major Injuries (RITG) initiated the process.

The main focus of the process was therefore to define inclusion and exclusion criteria and a minimum core data set with precise data point definitions for documenting and reporting data following major trauma. In addition, the aim was to develop a joint European standard for comparison of trauma care that was compatible with the large trauma registries in Europe, also adhering to the EuroTARN and the planned European Core Dataset (EuroCoreD). The process was built on the recommendations laid down by the 1st Utstein process on uniform reporting of data following major trauma formulated by the International Trauma Anaesthesia and Critical Care Society (ITACCS).

The process was based on a modified nominal group technique. After an initial e-mail round, the first meeting was held at the Utstein Abbey, Stavanger, Norway, in May 2007. During this meeting, the expert panel reached consensus on inclusion/exclusion criteria and started defining core data points. A second meeting at the Utstein Abbey in December 2007 continued the process where a consensus on an Utstein Template for documenting and reporting data after major trauma was reached.

The overall aim of the Utstein Trauma Template is to develop a system which is able to use the diversity in trauma care across Europe to identify key factors which are related to good outcomes – in other words to build a better trauma system by identifying the best parts from many different systems. Talking the same language with a unified set of data definitions is the first step in this process. Trauma Registries across Europe have agreed to implement these

definitions, a process which will require everyone to change their data collection, to add new data fields or to change the definitions of existing data fields.

The expert panel chose to focus on a relatively small set off 35 variables to describe patient, process and system characteristics, on the assumption that it is better to collect very good data about a small set of variables than to have a large data set of lower quality. The whole complexity of trauma management cannot be incorporated into 35 variables, however it is hoped that these key data points will allow an exploration of the relationships between processes, systems and outcomes. This would then form the basis for clinical trials or more detailed data collection around specific interventions, processes, or outcomes. While it may be tempting to look to a 'league table' of performance by country this is probably not the best approach – it is much better to look at specific system or treatment factors across countries to find positive or negative effects on outcomes.

It has already been shown that the 'top level' of international data can be shared across international trauma registries. The next challenge is to overcome the logistic, ethical, and legal barriers to the sharing of patient level data, in order to unlock the potential power of international comparisons. The Utstein Trauma Template is a significant step in this process.

Leicester, UK / Idse, Norway - November 1, 2008

Timothy J. Coats Hans Morten Lossius

Introduction

In 2007, the EuroTARN Group conducted a study to assess whether it was possible to compare data collected by a number of trauma services across Europe[2]. The study revealed that it was possible to collect and collate outcome data from established trauma registries across Europe with minimal additional infrastructure using a web-based system. Furthermore, it demonstrated support across Europe for a wide-scale registry allowing performance and outcome comparison.

Several studies have reported significant variations in composition and content of trauma registries, and have called for a uniform set of data variables, data definitions, value codes, and coding instructions, as well as uniform inclusion and exclusion criteria[9-12]. The core data of the revised Utstein Trauma Template[13] represent what is considered to be the most important variables for comparison of trauma care and outcome, and is intended to cover data from first (initial) hospital admissions.

To ensure implementation of the core dataset into local and/or national trauma registries, we have aimed to introduce a low number of variables. The use of the template does not preclude the possibility that local trauma registries consider more data to be core information. Further, it does not preclude the possibility that individual registries use other inclusion criteria than NISS > 15, as long as this minimum anatomic criterion is the cut-off level for comparison.

Definition of data variables is a complex and ongoing process and all readers are encouraged to ask for clarifications and point out potential improvements (se page no. 2).

Kjetil G. Ringdal

Inclusion criteria

- New Injury Severity Score[14] (NISS) > 15.

Exclusion criteria

- Admission to reporting hospital occurred more than 24 hours after injury.
- Patient declared dead before hospital arrival, or with no signs of life on hospital arrival and no response to hospital resuscitation.
- Asphyxia.
- Drowning.
- Burn patients should be excluded if the burn represents the predominant injury, or if the patient is treated in a specialised burn unit.

Specific premises

An effort should be made to define every core data variable as unambiguously as possible, to prevent any risk of misinterpretation. To meet this requirement, a data variable dictionary needs to contain information about ‘data point name’, ‘data variable number’, ‘descriptive field name’, ‘definition of data variable’ ‘type of data’, ‘data point categories or values’, ‘source of data information’, ‘coding guidance’ and ´date of last revision´.

The principles that were used for designing a descriptive (abbreviated) field name were:

- Use alphanumeric characters only (i.e., no spaces)
- Use maximum 16 characters
- General rule: where_what(_specification(_subspecification)); for time differences: dt_from_to
- Prefixes ("Where_") are as follows:

pt_	Patient
inj_	Injury
pre_	Prehospital
ed_	Emergency department
hosp_	Hospital
dt_	Time difference
res_	Result (outcome)

Predictive Model

Prediction models are composed of patient and injury severity variables that are considered important for prediction of outcome. Such models are not determinative; rather, they provide the probability of an outcome (e.g., survival) for a given patient. Complex scoring systems, such as the AIS derivatives and the Revised Trauma Score (RTS)[15], have been used to create outcome prediction models. In the literature, the probability of survival (Ps) of a trauma patient has most frequently been estimated with the Trauma and Injury Severity Score (TRISS) method[16-18] which is based on the Injury Severity Score (ISS)[19, 20], the RTS, age, and type of injury (blunt versus penetrating). However, experience from European and North American trauma registries have shown that other explanatory variables can be used for outcome prediction[5, 21-24].

Age

Data variable number
1

Descriptive field name
pt_age_yrs

Definition of data variable
The patient's age at the time of injury.

Type of data
Continuous

Data variable categories or values
Number

Source of data information
Hospital record

Coding guidance
Record in years rounded down. Ages above one year should be reported without decimals. Patients under one year of age should be reported with one decimal number (e.g., 6 months is 0.5). Use period as a decimal point.
The local hospitals should be able to record all ages with one decimal digit.

Age is calculated as date of injury minus date of birth.

If data is missing, leave data field blank.

Date of last revision
November 6, 2008

Gender

Data variable number
2

Descriptive field name
pt_gender

Definition of data variable
The patient's birth gender

Type of data
Nominal

Data variable categories or values
1 = Male
2 = Female
999 = Unknown

Source of data information
Hospital record
National insurance number
National population register
Identity card

Coding guidance
Accepted categories: 1-2 or 999

Date of last revision
October 26, 2008

Dominating Type of Injury

Data variable number
3

Descriptive field name
inj_dominant

Definition of data variable
The dominant type of injury produced by the trauma.

Type of data
Nominal

Data variable categories or values
1 = Blunt
2 = Penetrating
999 = Unknown

Source of data information
Hospital record
Autopsy record

Coding guidance
Accepted categories: 1-2 or 999

The dominating injury is defined as the one with the highest AIS score.

If a patient has both blunt and penetrating traumas with the same AIS severity score, penetrating trauma is defined as the predominant injury.

Definition of penetrating = Injury resulting from tissue penetration or punctation by a sharp object (e.g., bullet, knife, spear, glass shards, spike, bomb fragments).

Definition of blunt = Injury resulting from the application of a diffuse force (i.e., injury incurred when the human body hits or is hit by an outside object).

Examples:
- Crushes and amputations due to tearing forces are blunt injuries.
- A bite injury (e.g., dog bite) is penetrating if the teeth penetrate the body beyond superficial structures.
- Injuries resulting from explosions (blast injuries) are defined as penetrating if there is anatomical evidence that the injuries result from bomb fragments.
- Other blast injuries should be recorded as blunt (e.g., if an extremity has been injured or amputated due to changes in air pressure (barotrauma)).

- If a finger has been amputated as a result of a ballistic injury, it should be classified as penetrating injury.
- If a limb has been cut off (amputated) by a knife or sword, it should be defined as penetrating injury.
- If a blunt object/instrument (e.g., pipe, pole) penetrates the body, it should be defined as penetrating injury.
- If a patient has suffered a laceration of the forehead as a result of direct impact against the front windscreen of a car, the injury should be defined as a blunt injury.

Date of last revision

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Mechanism of Injury

Data variable number

4

Descriptive field name

inj_mechanism

Definition of data variable

The mechanism (or external factor) that caused the injury event.

Type of data

Nominal

Data variable categories or values

1 = Traffic: motor vehicle accident (the injured patient is an occupant of a motor vehicle) (i.e., car, pickup truck, van, heavy transport vehicle, bus)
2 = Traffic: motorcycle accident (the injured patient is an occupant of a motorcycle)
3 = Traffic: bicycle accident (the injured patient is an occupant of a bicycle)
4 = Traffic: pedestrian (the injured patient is a pedestrian)
5 = Traffic: other (the injured patient is an occupant of other means of transport) (i.e., ship, airplane, railway train)
6 = Shot by handgun, shotgun, rifle, other firearm of any dimension
7 = Stabbed by knife, sword, dagger, other pointed or sharp object
8 = Struck or hit by blunt object (i.e., tree, tree branch, bar, stone, human body part, metal, other)
9 = Low energy fall (fall at the same level)
10 = High energy fall (fall from a higher level)
11 = Blast injury (the injured patient is involved in an explosion)
12 = Other
999 = Unknown

Source of data information

EMS record
HEMS record
Hospital record
Autopsy record
Other relevant documentation

Coding guidance

Accepted categories: 1-12 or 999

Fall-related injuries should be separated into high and low energy falls, where the impact is more important than the exact height; same level falls belong to low falls while falls from one or more floors are high falls.

Low falls might be classified as <1m by some registries, and <2m and <3m by others. We believe that they are still low falls. If an exact definition is required, we suggest a person's height as a cut-off.

This is an area where there is a lack of uniformity and lack of good evidence, so for future development, the Utstein Template suggestion is that individual registries record the actual estimated height of fall in meters so that an analysis can be performed.

Date of last revision

November 5, 2008

Intention of Injury

Data variable number

5

Descriptive field name

inj_intention

Definition of data variable

Information about the role of human intent of an injury, primarily determined by the incident and not by the resulting injury.

Type of data

Nominal

Data variable categories or values

1 = Accident (unintentional)
2 = Self-inflicted (suspected suicide, incomplete suicide attempt, or injury attempt)
3 = Assault (suspected)
4 = Other
999 = Unknown

Source of data information

EMS record
HEMS record
Hospital record
Autopsy record
Other relevant documentation

Coding guidance

Accepted categories: 1-4 or 999

Date of last revision

October 24, 2008

Pre-injury ASA Physical Status Classification

Data variable number

6

Descriptive field name

pt_asa_preinjury

Definition of data variable

The co-morbidity existing before the incident.

Type of data

Ordinal

Data variable categories or values

1 = ASA-PS 1. A normal healthy patient
2 = ASA-PS 2. A patient with mild systemic disease
3 = ASA-PS 3. A patient with severe systemic disease
4 = ASA-PS 4. A patient with severe systemic disease that is a constant threat to life
5 = ASA-PS 5. A moribund patient who is not expected to survive without an operation
6 = ASA-PS 6. A declared brain-dead patient whose organs are being removed for donor purposes
999 = Unknown

Source of data information

Hospital record
Previous hospital records
X-ray study reports
Autopsy reports
Other relevant documentation

Coding guidance

Accepted categories: 1-6 or 999

1 = ASA-PS 1. A normal healthy patient.
Guidelines: No organic, physiologic, biochemical or psychiatric disturbance. Any disorder is localized, without systemic effects. Smoking < 5 cigarettes per day.
Example: Healthy non-smoker, admitted for varicose vein operation

2 = ASA-PS 2. A patient with mild systemic disease.
Guidelines: Present pathology might imply specific measures or anaesthesia related precautions. The disturbance(s) might be caused by the condition to be surgically treated or by another pathologic process. Smoking > 5 cigarettes per day.

Examples: Mild organic heart disease. Uncomplicated diabetes mellitus (type 1 or 2). Benign hypertension without complications. Healthy patient with trismus.

3 = ASA-PS 3. A patient with severe systemic disease.
Examples: Diabetes mellitus with organ complications. Disabling heart disease. Moderate to severe respiratory disease. Angina pectoris. Myocardial infarction > 6 months ago.

4 = ASA-PS 4. A patient with severe systemic disease that is a constant threat to life.
Guidelines: The disease is not necessarily related to the condition to be surgically treated, neither is it necessarily improved by the surgical intervention per se.
Examples: Malignant hypertension. Myocardial infarction < 6 months ago. Severe liver, kidney, respiratory, or endocrine dysfunction. Manifest cardiac failure. Unstable angina pectoris. Subarachnoid haemorrhage – patient awake or somnolent.

5 = ASA-PS 5. A moribund patient who is not expected to survive without an operation.
Examples: Patient in circulatory shock because of ruptured aortic aneurysm. Deeply comatose patient with intracranial haemorrhage.

6 = ASA-PS 6. A declared brain-dead patient whose organs are being removed for donor purposes.

The pre-injury co-morbidity definitions used above, correspond to the American Society of Anesthesiologists Physical Status (ASA-PS) classification system[25].

The ASA-PS examples and guidelines in the template are translated from the Norwegian edition of ASA-PS[26, 27].

For the Utstein Template, the ASA-PS classification system should be used solely to categorise co-morbidity that exists before injury[27]. Derangements resulting from the injury are not considered.

The category option "unknown" should be used in cases where no information on pre-injury health is obtainable, e.g., patients that die in the early hospital care process/in the ED.

Date of last revision

October 28, 2008

Pre-hospital Cardiac Arrest

Data variable number

7

Descriptive field name

pre_card_arrest

Definition of data variable

Injury-related pre-hospital cardiac arrest.

Type of data

Nominal

Data variable categories or values

1 = Yes
2 = No
999 = Unknown

Source of data information

EMS record
HEMS record
Hospital record

Coding guidance

Accepted categories: 1-2 or 999

Cardiac arrest is the cessation of cardiac mechanical activity, confirmed by the absence of a detectable pulse, unresponsiveness, and apnoea (or agonal, gasping respirations)[28].

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Glasgow Coma Scale Score upon arrival of EMS personnel at scene

Data variable number
8

Descriptive field name
pre_gcs_sum

Definition of data variable
First recorded pre-interventional Glasgow Coma Scale (GCS) score upon arrival at scene of medical personnel trained to assess.

Type of data
Ordinal

Data variable categories or values
3-15
999 = Unknown

Source of data information
EMS record (preferably ambulance record or HEMS record)

Coding guidance
Report on the 3-15 point ordinal scale, and not according to the RTS coded value scale[15].
The GCS score is the sum of the Eye, Verbal and Motor scores[29].

Intervention = any therapeutic care that may affect GCS.

If the total GCS score is unknown or not documented, code as 999.

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Glasgow Coma Scale Motor Component upon arrival of EMS personnel at scene

Data variable number
9

Descriptive field name
pre_gcs_motor

Definition of data variable
First recorded pre-interventional Glasgow Coma Scale (GCS) motor component upon arrival at scene of medical personnel trained to assess.

Type of data
Ordinal

Data variable categories or values
6 = Obeys commands / appropriate response to pain
5 = Localising pain
4 = Withdrawal from pain
3 = Flexion to pain (decorticate)
2 = Extension to pain (decerebrate)
1 = No motor response
999 = Unknown

Source of data information
EMS record (preferably ambulance record or HEMS record)

Coding guidance
Accepted categories: 1-6, or 999

If the GCS motor component is unknown or not documented, code as 999.
If only the total GCS score (data variable 8) is known, code as 999, unknown.

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Glasgow Coma Scale Score upon arrival in ED / hospital

Data variable number

10

Descriptive field name

ed_gcs_sum

Definition of data variable

First recorded Glasgow Coma Scale (GCS) score upon arrival in the ED / hospital.

Type of data

Ordinal

Data variable categories or values

3-15
99 = Intubated on arrival
999 = Unknown

Source of data information

Hospital record (preferably ED record)

Coding guidance

Report on the 3-15 point ordinal scale, and not according to the RTS coded value scale.
The GCS score is the sum of the Eye, Verbal and Motor scores.

If the total GCS score is unknown or not documented, code as 999.
If the patient is in general anaesthesia/intubated/curarized on arrival, code as 99, intubated on arrival.

Date of last revision

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Glasgow Coma Scale Motor Component upon arrival in ED / hospital

Data variable number
11

Descriptive field name
ed_gcs_motor

Definition of data variable
First recorded GCS motor component upon arrival in the ED / hospital.

Type of data
Ordinal

Data variable categories or values
6 = Obeys commands / appropriate response to pain
5 = Localising pain
4 = Withdrawal from pain
3 = Flexion to pain (decorticate)
2 = Extension to pain (decerebrate)
1 = No motor response
99 = Intubated on arrival
999 = Unknown

Source of data information
Hospital record (preferably ED record)

Coding guidance
Accepted categories: 1-6, 99 or 999

If the GCS motor component is unknown or not documented, code as 999.
If only the total GCS score (data variable 10) is known, code as 999, unknown.
If the patient is in general anaesthesia/intubated/curarized on arrival, code as 99, intubated on arrival.

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Systolic Blood Pressure upon arrival of EMS personnel at scene

Data variable number

12a

Descriptive field name

pre_sbp_value

Definition of data variable

First recorded SBP upon arrival at scene of medical personnel trained to assess. Preferably, use pre-interventional SBP.

Type of data

Continuous

Data variable categories or values

Number

Source of data information

EMS record (preferably ambulance record or HEMS record)

Coding guidance

Use raw values (continuous data) where they are obtainable and clinical categories (data variable 12b) in those cases missing raw values.
Patients in cardiac arrest should be assigned SBP = 0.
If data is unknown or not documented, leave data field blank.

Measure the SBP by arm cuff.
Unit of measurement is mmHg.

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Systolic Blood Pressure Clinical Category upon arrival of EMS personnel at scene

Data variable number

12b

Descriptive field name

pre_sbp_rtscat

Definition of data variable

First recorded SBP Clinical Category upon arrival at scene of medical personnel trained to assess. Use only if actual SBP value (data variable 12a) is missing.
Preferably, use pre-interventional SBP.

Type of data

Ordinal

Data variable categories or values

4 = RTS 4 > 89 (“good radial pulse”)
3 = RTS 3 76 - 89 (“weak radial pulse”)
2 = RTS 2 50 - 75 (“femoral pulse”)
1 = RTS 1 1 - 49 (“only carotid pulse”)
0 = RTS 0 0 (“no carotid pulse”)
999 = Unknown

Source of data information

EMS record (preferably ambulance record or HEMS record)

Coding guidance

Accepted categories: 0-4 or 999

Preferably, record the pre-interventional SBP.
Leave data field blank if the actual SBP value is documented in 12a. If both 12a and clinical category are missing, use code 999, unknown.

Date of last revision

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Systolic Blood Pressure upon arrival in ED / hospital

Data variable number
13a

Descriptive field name
ed_sbp_value

Definition of data variable
First recorded SBP upon arrival in the ED / hospital.

Type of data
Continuous

Data variable categories or values
Number

Source of data information
Hospital record (preferably ED record)

Coding guidance
Use raw values (continuous data) where they are obtainable and clinical categories (data variable 13b) in those cases missing raw values.
Patients in cardiac arrest should be assigned SBP = 0.
If data is unknown or not documented, leave data field blank.

Measure the SBP by arm cuff or arterial line.
Unit of measurement is mmHg.

Date of last revision
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Systolic Blood Pressure Clinical Category upon arrival in ED / hospital

Data variable number

13b

Descriptive field name

ed_sbp_rtscat

Definition of data variable

First recorded SBP Clinical Category upon arrival in the ED / hospital. Use only if actual SBP value (data variable 13a) is missing.

Type of data

Ordinal

Data variable categories or values

4 = RTS 4 > 89 (“good radial pulse”)
3 = RTS 3 76 - 89 (“weak radial pulse”)
2 = RTS 2 50 - 75 (“femoral pulse”)
1 = RTS 1 1 - 49 (“only carotid pulse”)
0 = RTS 0 0 (“no carotid pulse”)
999 = Unknown

Source of data information

Hospital record (preferably ED record)

Coding guidance

Accepted categories: 0-4 or 999

Preferably, record the raw value.
Leave data field blank if the actual SBP value is documented in 13a. If both 13a and clinical category are missing, use code 999, unknown.

Date of last revision

October 25, 2008

Respiratory Rate upon arrival of EMS personnel at scene

Data variable number
14a

Descriptive field name
pre_rr_value

Definition of data variable
First recorded RR upon arrival at scene of medical personnel trained to assess.

Type of data
Continuous

Data variable categories or values
Number

Source of data information
EMS record (preferably ambulance record or HEMS record)

Coding guidance
Use raw values (continuous data) where they are obtainable and clinical categories (data variable 14b) in those cases missing raw values.
Preferably, use pre-interventional RR.
If data is unknown or not documented, leave data field blank.

Unit of measurement is breaths per minute.

Date of last revision
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Respiratory Rate Clinical Category upon arrival of EMS personnel at scene

Data variable number

14b

Descriptive field name

pre_rr_rtscat

Definition of data variable

First recorded RR upon arrival at scene of medical personnel trained to assess.
Use only if actual RR value (data variable 14a) is missing.
Preferably, use pre-interventional RR.

Type of data

Ordinal

Data variable categories or values

4 = RTS 4 10 - 29 (“normal”)
3 = RTS 3 > 29 (“fast”)
2 = RTS 2 6 - 9 (“slow”)
1 = RTS 1 1 - 5 (“gasp”)
0 = RTS 0 0 (“no respiration”)
999 = Unknown

Source of data information

EMS record (preferably ambulance record or HEMS record)

Coding guidance

Accepted categories: 0-4 or 999

Preferably, record the pre-interventional RR.
Preferably, record the raw values.
Leave data field blank if the actual RR value is documented in 14a. If both 14a and clinical category are missing, use code 999, unknown.

Date of last revision

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Respiratory Rate upon arrival in ED / hospital

Data variable number
15a

Descriptive field name
ed_rr_value

Definition of data variable
First recorded RR upon arrival in the ED / hospital.

Type of data
Continuous

Data variable categories or values
Number

Source of data information
Hospital record (preferably ED record)

Coding guidance
Use raw values (continuous data) where they are obtainable and clinical categories (data variable 15b) in those cases missing raw values.

If data is unknown or not documented, leave data field blank.
If the patient is in general anaesthesia/intubated/curarized on arrival, leave data field blank.
If the patient is intubated before arrival in the ED / hospital, use code 99, intubated before arrival. This data is also documented in data variable 26.

Unit of measurement is breaths per minute.

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Respiratory Rate Clinical Category upon arrival in ED / hospital

Data variable number

15b

Descriptive field name

ed_rr_rtscat

Definition of data variable

First recorded RR upon arrival in the ED / hospital. Use only if actual RR value (data variable 14a) is missing.

Type of data

Ordinal

Data variable categories or values

4 = RTS 4 10 - 29 (“normal”)
3 = RTS 3 > 29 (“fast”)
2 = RTS 2 6 - 9 (“slow”)
1 = RTS 1 1 - 5 (“gasp”)
0 = RTS 0 0 (“no respiration”)
999 = Unknown

Source of data information

Hospital record (preferably ED record)

Coding guidance

Accepted categories: 0-4 or 999
Preferably, record the raw value.
Leave data field blank if the actual RR value is documented in 15a. If both 15a and clinical category are missing, use code 999, unknown.

Date of last revision

October 24, 2008

Arterial Base Excess

Data variable number
16

Descriptive field name
ed_be_art

Definition of data variable
First measured arterial base excess after arrival in the ED / hospital.

Type of data
Continuous

Data variable categories or values
Number

Source of data information
Hospital record

Coding guidance
Document the first arterial base excess (BE) value measured within the first hour after ED / hospital arrival. If more than one value has been measured within the first hour after arrival, document the first measured value, not the worst value.

If arterial BE is unknown or not documented, leave data field blank.
If arterial BE is not measured within the first hour after arrival, use code 9999.0.

Use period as a decimal point.
Unit of measurement is mmol/l.
Reference range for base excess: ±3 mmol/l

Date of last revision
November 20, 2008

Coagulation: INR

Data variable number
17

Descriptive field name
ed_inr

Definition of data variable
First measured INR within the first hour after hospital arrival.

Type of data
Continuous

Data variable categories or values
Number

Source of data information
Hospital record

Coding guidance
Measure the INR within the first hour after arrival.
Use period as a decimal point.
If data is unknown or not documented, leave data field blank.
If the INR is not measured within the first hour after arrival, use code 9999.0.

Date of last revision
November 20, 2008

Number of Days on Ventilator

Data variable number
18

Descriptive field name
hosp_vent_days

Definition of data variable
Total number of patient days spent on a mechanical ventilator.

Type of data
Continuous

Data variable categories or values
Number

Source of data information
Hospital record

Coding guidance
Record in full day increments with any partial day listed as a full day. If a patient is ventilated for half a day in the reporting hospital, number of days on ventilator = 1. No days on ventilator = 0 days.
Include all episodes.
Days on CPAP/BiPAP ventilation, both from a modern ventilator and from external devices, count as days on a ventilator.

If number of days on ventilator is unknown, leave data field blank.

Date of last revision
October 28, 2008

Length of Stay in Reporting Hospital

Data variable number

19

Descriptive field name

hosp_los_days

Definition of data variable

Length of stay in the reporting hospital.

Type of data

Continuous

Data variable categories or values

Number

Source of data information

Hospital record

Coding guidance

Record in full day increments with any partial day listed as a full day. If a patient is admitted for half a day in main hospital, length of stay = 1 day. If the patients die the same day as admission, length of stay = 1 day.
Do not count length of stay as date of discharge (D_d) minus date of admission (D_a), which would give one day less. Rather, calculate as $(D_d - D_a) + 1$.

If length of stay is unknown, leave data field blank.

Date of last revision

November 5, 2008

Discharge Destination

Data variable number

20

Descriptive field name

hosp_dischg_dest

Definition of data variable

The patient's destination after end of acute care in the reporting hospital.

Type of data

Nominal

Data variable categories or values

1 = Home
2 = Rehabilitation
3 = Morgue
4 = Another CCU, higher treatment level
5 = Another CCU, same level of care (e.g., foreign citizen sent home, guest patient sent to CCU at his/her own hospital)
6 = Another intermediate or low care somatic hospital ward
7 = Other
999 = Unknown

Source of data information

Hospital record

Coding guidance

Accepted categories: 1-7 or 999

CCU = critical care unit (including ICU, ITU, Paediatric ICU, etc.)

Date of last revision

October 24, 2008

Glasgow Outcome Scale Score at Discharge from Reporting Hospital

Data variable number

21

Descriptive field name

res_gos_dischg

Definition of data variable

Glasgow Outcome Scale[30] (GOS) score at discharge from reporting hospital.

Type of data

Ordinal

Data variable categories or values

5 = Good recovery
4 = Moderate disability (e.g., disabled but independent of care)
3 = Severe disability (e.g., conscious but disabled; care-dependent; intubated)
2 = Persistent vegetative state (i.e., unresponsive; care-dependent)
1 = Death
999 = Unknown

Source of data information

Hospital record

Coding guidance

Accepted categories: 1-5 or 999

Although GOS was developed for patients with head injuries, the intention is to use the scale as an estimate of the amount of care needed for a trauma patient beyond the acute hospital stay.

Intubated patients are coded with a GOS score 3 = Severe disability (except head injury patients in persistent vegetative state who are coded as GOS score 2). A fully conscious but tetraplegic patient is GOS score 3 as the patient is severely disabled and care-dependent.

Date of last revision

November 5, 2008

Survival Status

Data variable number
22

Descriptive field name
res_survival

Definition of data variable
Alive or dead 30 days after injury.

Type of data
Nominal

Data variable categories or values
1 = Dead
2 = Alive
999 = Unknown

Source of data information
Hospital record
National population register
Death certificate information

Coding guidance
Accepted categories: 1-2 or 999

30-day mortality is the endpoint, and indicates patient staus at 30-days. Death occurring later than 30 days after injury should not be considered.
Foreign citizens, who are alive when repatriated to their home country before 30 days after injury, are defined as survivors.

Date of last revision
November 20, 2008

Abbreviated Injury Scale

Data variable number

23

Descriptive field name

inj_ais

Definition of data variable

The AIS severity codes that reflect the patient's injuries.

Type of data

Ordinal

Data variable categories or values

Number

Source of data information

Hospital records
X-ray study reports
Autopsy records
EMS record
HEMS record
Other relevant documentation

Coding guidance

The edition of the AIS coding dictionary should be documented; AIS 2005[31] is the Utstein-recommendation. For the purpose of comparison, AIS 2005 is the selected edition.

All injuries should be listed, even duplicated codes (e.g., bilateral femoral fractures, multiple spine fractures).
When comparison is made, the AIS codes should be exported as a separate file with the identical patient number as a reference link.

AIS has been used to describe and rank injuries by severity throughout the body, and is incorporated in several injury scoring systems[32] that assess the combined effects of multiple injuries[31]. The most employed systems are the Injury Severity Score (ISS)[19, 20], the Anatomic Profile (AP)[33], and the New Injury Severity Score (NISS)[14]. ISS is the sum of the squares of the highest AIS scores in each of the three most severely injured ISS body regions, and NISS is defined as the sum of the squares of the three highest AIS codes regardless of body region.
Coding a traumatic amputation according to the AIS coding dictionary results in a single AIS score (e.g., Traumatic amputation below knee, AIS = 3) and will exclude the patient from comparison (ISS and NISS = 9).

If the tibia injury, fibula injury, and popliteal artery injury resulting from an amputation are all coded separately and according to NISS, the patient will be included in comparisons (NISS = 17).
The latter coding convention is recommended.

Date of last revision

November 5, 2008

System Characteristic Descriptors

Data variables in the System Characteristic Descriptors group describe trauma systems. Within Europe, there are large differences in philosophies and structures of trauma care systems, and these data variables should indicate key differences between systems and permit comparisons of the effect of system structure on outcomes.

Time from Alarm until Hospital Arrival

Data variable number

24

Descriptive field name

dt_alarm_hosp

Definition of data variable

Time interval from when the alarm call is answered at the emergency call centre until the patient arrives at the reporting hospital.

Type of data

Continuous

Data variable categories or values

HH:MM

Source of data information

Dispatch centre printouts
Emergency medical communication centre printouts
EMS record
HEMS record
Hospital record

Coding guidance

In some systems (e.g., Norway, Sweden, UK), the call-taker is separated from the person dispatching the resources[34]. Preferably, record the time of call to the emergency medical communication centre. If the time of call to the emergency medical communication centre is not obtainable, record the time of call to the dispatch centre.

This data field should only be used for primary (first hospital) admissions.
If the time interval is unknown, leave data field blank.

Date of last revision

November 18, 2008

Highest Level of Pre-Hospital Care Provider

Data variable number

25

Descriptive field name

pre_provider

Definition of data variable

The highest available level of competence of pre-hospital care providers involved in the care of the injured patient.

Type of data

Ordinal

Data variable categories or values

1 = Level I. No Field Care
2 = Level II. Basic Life Support
3 = Level III. Advanced Life Support – No Physician Present
4 = Level IV. Advanced Life Support On-Scene – Physician Field Care
5 = Other
999 = Unknown

Source of data information

EMS record
HEMS record
Hospital record

Coding guidance

Accepted categories: 1-5 or 999

Record the highest level of competence of the pre-hospital care providers involved in treating the patient, regardless of whether or not the patients needs were different. The revised template's categorisation of level of provider is based on levels proposed by McSwain[35].

1 = Level I. No Field Care.
Guidelines: No care, beyond layman (nonprofessional) first aid, is provided for the patient; transportation by private vehicle without medical supervision.

2 = Level II. Basic Life Support.
Guidelines: After arriving at the scene, the EMT / paramedic provides airway management, including bag-valve-mask ventilation; enhanced oxygen (FiO_2 approximately 0.85); compression (or tourniquet) haemorrhage control; potential fracture immobilisation utilizing, at minimum, a cervical collar and long backboard with all bones appropriately immobilised to the backboard; rapid movement of the patient to the hospital.

3 = Level III. Advanced Life Support – No Physician Present.
Guidelines: This level includes everything listed above in the basic life support (level II), but with the addition of endotracheal intubation and/or i.v. fluid replacement based on EMT / paramedic judgment, nurse judgement or physician-written protocols.

4 = Level IV. Advanced Life Support On-Scene – Physician Field Care.
Guidelines: A physician is on scene and provides or directs all patient care. This physician assumes responsibility of the entire scene management.

Date of last revision

November 5, 2008

Pre-Hospital Intubation

Data variable number
26a

Descriptive field name
pre_intubated

Definition of data variable
Was the patient intubated before arrival at the hospital?

Type of data
Nominal

Data variable categories or values
1 = Yes
2 = No
999 = Unknown

Source of data information
EMS record
HEMS record
Hospital record
Other relevant documentation

Coding guidance
Accepted categories: 1-2 or 999

Date of last revision
October 26, 2008

Type of Pre-Hospital Intubation

Data variable number

26b

Descriptive field name

pre_intub_type

Definition of data variable

Type of pre-hospital intubation.

Type of data

Nominal

Data variable categories or values

1 = A tube in the trachea (orotracheal, nasotracheal, or surgical airway) – drug assisted
2 = A supraglottic airway adjunct that prevents speech (such as oesophago-tracheal combitube, the laryngeal tube, and various kinds of laryngeal masks) – drug assisted
3 = A tube in the trachea (orotracheal, nasotracheal, or surgical airway) – not drug assisted
4 = A supraglottic airway adjunct that prevents speech (such as oesophago-tracheal combitube, the laryngeal tube, and various kinds of laryngeal masks) – not drug assisted
5 = Other
999 = Unknown

Source of data information

EMS record
HEMS record
Hospital record

Coding guidance

Accepted categories: 1-5 or 999

Supraglottic airway devices (like the oesophago-tracheal combitube, the laryngeal tube and various kinds of laryngeal masks) are not inserted past the vocal cords into the trachea.
Use of an oropharyngeal airway is not considered as intubation.
Drug assisted = anaesthesia, neuromuscular blocking drugs, and deep sedation.

Date of last revision

November 4, 2008

Type of Transportation

Data variable number

27

Descriptive field name

pre_transport

Definition of data variable

The type of transportation delivering the patient to the reporting hospital.

Type of data

Nominal

Data variable categories or values

1 = Ground ambulance
2 = Helicopter ambulance
3 = Fixed-wing ambulance
4 = Private/public vehicle
5 = Walk-in
6 = Police
7 = Other
999 = Unknown

Source of data information

EMS record
HEMS record
Hospital record

Coding guidance

Accepted categories: 1-7 or 999

If the patient is transported by a fixed-wing ambulance to an airport in the near proximity of a trauma centre, and transported the last (and shortest) distance from the airport to the hospital by ground ambulance, record the fixed-wing ambulance transport.

Date of last revision

October 28, 2008

Type of First Key Emergency Intervention

Data variable number

28

Descriptive field name

ed_emerg_proc

Definition of data variable

The first key emergency intervention performed for treatment and stabilisation of the patient.

Type of data

Nominal

Data variable categories or values

1 = Damage control thoracotomy (any emergency or urgent thoracotomy performed for bleeding or suspected bleeding into the chest, but excluding simple thoracic tube drainage)
2 = Damage control laparotomy (any emergency or urgent laparotomy performed for bleeding or suspected bleeding into the abdomen, including bleeding from the aorta)
3 = Extraperitoneal pelvic packing
4 = Limb revascularisation (arterial injury necessitating vascular surgery or interventional radiology, including all interventions for pulseless limb, decreased perfusion and intimal arterial injuries)
5 = Interventional radiology (angiographic embolisation; stent; stent-graft placement – excluding limb revascularisations which are classified as 4)
6 = Craniotomy
7 = Intracranial pressure device insertion (excluding cases were the ICP device was inserted as part of a craniotomy which are classified as 6)
8 = Other
99 = No emergency interventions performed
999 = Unknown

Source of data information

EMS record
HEMS record
Hospital record

Coding guidance

Accepted categories: 1-8, 99, or 999

Record only the FIRST of the defined set of emergency interventions. When measuring the time interval until first performed emergency intervention (data variable nr. 35), the categories 'other' and 'unknown' cannot be used. A summation of times until 'other' or 'unknown' interventions would be too difficult to interpret.

Key emergency interventions are essential procedures conducted during the hospital stay (ED, OR, critical care unit) for the treatment and stabilisation of the patient's injuries.

Date of last revision

November 20**,** 2008

Activation of the Trauma Team

Data variable number
29

Descriptive field name
ed_tta

Definition of data variable
The hospital's trauma team was activated prior to or upon arrival of the patient.

Type of data
Nominal

Data variable categories or values
1 = Yes
2 = No
99 = The hospital has no formal trauma team activation
999 = Unknown

Source of data information
Hospital record

Coding guidance
Accepted categories: 1-2, 99 or 999

Date of last revision
October 26, 2008

Inter-Hospital Transfer

Data variable number
30

Descriptive field name
hosp_transferred

Definition of data variable
Was the patient transferred from/to another hospital for acute treatment?

Type of data
Nominal

Data variable categories or values
1 = No
2 = Yes - Transferred IN to the reporting hospital
3 = Yes - Transferred OUT of the reporting hospital
4 = Yes - Transferred both IN to and OUT of the reporting hospital
999 = Unknown

Source of data information
Hospital record

Coding guidance
Accepted categories: 1-4 or 999

Date of last revision
October 24, 2008

Highest Level of In-Hospital Care

Data variable number
31

Descriptive field name
hosp_care_level

Definition of data variable
The highest level of care at the reporting hospital.

Type of data
Ordinal

Data variable categories or values
1 = Emergency Department
2 = General Ward
3 = Operation Theatre
4 = High Dependency Unit (HDU)
5 = Critical Care Unit (definition based on nurse to patient ratio)
999 = Unknown

Source of data information
Hospital record

Coding guidance
Accepted categories: 1-5 or 999

Critical Care Unit = ICU, ITU, Paediatric ICU, Coronary Care Unit, Neurosurgical ICU etc.
Patients who need more in-depth care and observation, such as after an operation, or those who have a single failing organ system, such as the kidneys will usually be cared for in a high dependency unit (HDU).
Patients who cannot breathe without medical help, those who need support for at least two failing organ systems, e.g., kidneys and respiratory system, or have multi-organ failure, will usually be cared for in intensive care.

This is an ordinal scale ranging from 1-5 where category 5 is defined as the highest level of in-hospital care. Record only the highest level of in-hospital care that the patient received at the reporting hospital.

Date of last revision
October 28, 2008

Process Mapping Variables

Process Mapping variables are intended to describe trauma care at an individual trauma centre (e.g., what happens to a patient after a major trauma); these are used for documentation of the patient journey, care process and care activities.

Time from Alarm until Arrival at Scene

Data variable number

32

Descriptive field name

dt_alarm_scene

Definition of data variable

The time interval from when the emergency call is answered (at the emergency call centre) until the first medical provider (at least the equivalent of EMT's) arrives at the patient.

Type of data

Continuous

Data variable categories or values

HH:MM

Source of data information

Dispatch centre printouts
Emergency call centre printouts
EMS record
HEMS record
Hospital record

Coding guidance

Arrives at the patient = when the dispatch vehicle has stopped at the scene of injury.

Preferably, record the time of call to the emergency medical communication centre. If the time of call to the emergency medical communication centre is not obtainable, record the time of call to the dispatch centre.

This data field should only be used for first hospital admissions.
If the time interval is unknown, leave data field blank.

Date of last revision

November 20, 2008

Time until Normal Arterial Base Excess

Data variable number

33

Descriptive field name

dt_ed_norm_be

Definition of data variable

Time interval from hospital / ED arrival until first measured arterial base excess value within normal range.

Type of data

Continuous

Data variable categories or values

HH:MM

Source of data information

Hospital record

Coding guidance

Measure the arterial base excess (BE) at hospital arrival (data variable 16), and in cases of abnormal values, document the time interval from hospital arrival until first measured normalised arterial BE (within reference range).

If the patient arrives with a normal arterial BE, use the time interval 00:00.
If the time interval from hospital arrival until normalisation is unknown, leave data field blank.
In cases where the arterial BE normalises, but the exact time of normalisation is unknown, document the time interval from hospital arrival until the first measured normalised arterial BE.
If normalisation of arterial BE does not occur, use the time interval 9999:00.

Reference range for base excess: ±3 mmol/l.

The time interval required to achieve normal arterial BE is considered an overall marker of the efficiency of patient treatment (including resuscitation, diagnostics and surgery) and as an indicator of process quality.
The arterial BE should be measured regularly after hospital arrival.

The value 9999:00 should not be included in calculation of averages when analysing this continuous data variable.

Date of last revision

November 20, 2008

Time until First CT Scan

Data variable number
34

Descriptive field name
dt_ed_first_ct

Definition of data variable
The time interval from hospital admission until first CT scan image.

Type of data
Continuous

Data variable categories or values
HH:MM

Source of data information
Hospital record

Coding guidance
Use the time marked on the CT scan image (if clock is correct).
If the time interval is unknown, leave data field blank.

Date of last revision
October 28, 2008

Time until First Key Emergency Intervention

Data variable number
35

Descriptive field name
dt_ed_emerg_proc

Definition of data variable
Time from hospital admission until the FIRST emergency intervention.

Type of data
Continuous

Data variable categories or values
HH:MM

Source of data information
Hospital record
EMS record
HEMS record

Coding guidance
Document the time interval from hospital admission until the time of FIRST knife to skin is performed. Consider only the emergency interventions (1-7) listed in data variable number 28.
If the time interval is unknown, leave data field blank.

Date of last revision
October 28, 2008

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