STAG TRAUMA

Quality Indicators

Document Control

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Document History			
Version	**Date**	**Comment**	**Author(s)**
V0.1	23.08.10	First Draft Created	KW
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V0.3		comments from SG/CMcG	KW
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V1.0	24.01.11	Final for use during audit	KW/CMcG
V1.1	14.03.11	Updated with pro forma v4.0	KW
V1.2		Additional Pelvic Standard added	KW
V1.3	22.07.11	Wording of indicators tightened-up.	Fiona Lees
V1.4	19.09.11	Standard 6c wording corrected.	FL
V1.5	20.09.11	Exclusion criteria updated	KW
V2.0	01.12.11	Reviewed by Steering group	KW
V2.1	27-09-	Added most up-to-date version of pro forma to appendix	FL
V3.0	03-09-	Reviewed by Steering Group	KW
V3.0	22.10.13	Reviewed by STAG team, minor updates added	KW
V3.0	05.12.13	Updated Inclusion Criteria Added	Laura Hunter
V3.1	09.01.14	Reviewed wording and analytic elements for monthly	KW/Sinforosa Pizzo
V3.2	27.11.14	Inclusion/Exclusion criteria updated	LH
V3.3	05.06.17	Reviewed and updated	Angela Khan

Introduction

The Scottish Trauma Audit Group (STAG) returned to auditing trauma care in January 2011. At the start of this audit the STAG steering developed a set of Quality Indicators to be used by local hospital teams to improve patient care. Existing evidence and guidance of best practice were collated from the literature and from learned organisations [1-10]. Assessment of the available information was co-ordinated via the STAG Steering Group members who agreed on the final indicators. This version of the indicators represents a review of them against current evidence and practice as well as a review to ensure the efficacy in selecting patients for review and effecting change.

The cornerstone of the STAG Trauma is the invaluable feedback between Local Coordinators and their Emergency Departments (ED). It is intended that these indicators should be used as a quality improvement tool through measurement of progress against the individual recommendations over time. Patients may be identified for local review through the reporting of these indicators on a monthly basis back to the individual units strengthening clinical feedback throughout the audit.

Variation against these indicators will be a matter for individual units with local understanding of service configuration who will be able to monitor progress over time rather than attempting to achieve a specific compliance.

In 2015, these QIs were reviewed by the STAG Steering Group and four were discontinued as the compliance was continuously high and it was agreed that they were embedded into practice.

Outcome Prediction Model

STAG uses AIS 2005 (2008 update) [11] dictionary to code injuries and assign severity and has also adopted PS12 [12] outcome prediction model.

AIS and Injury Severity Score (ISS) are used to code and score individual injuries and score the overall severity of injuries. ISS is combined with Glasgow Coma Scale (GCS) and adjusted for age and gender to give a resultant probability of survival for that patient.

Details of audit inclusion and exclusion criteria can be found on the STAG website www.stag.scot.nhs.uk

Indicators are applied only to patients whose first receiving hospital is a participating STAG Emergency Department.

All injuries are as described by the AIS code assigned to them.

1. Major Trauma Patients

1.1 Where a patient has major trauma (ISS > 15) a pre alert call should be made by the Scottish Ambulance Service (SAS) to the receiving ED.

Standard Evidence: Advance warning details from the Scottish Ambulance Service for patients with major injuries should include various details (RCS/BOA Standard 13.1).

Case Selection: Patients with an ISS > 15, arriving by SAS

Measure: Number and percentage of major trauma patients arriving by ambulance or air at first receiving hospital, for whom:

- There was not a pre alert call.
- There was a pre alert call.

1.2 Patients with major trauma (ISS > 15) should be managed in the resuscitation room.

Standard Evidence: Expert opinion.

Case Selection: Patients with an ISS > 15

Measure: Number and percentage of major trauma patients who:

- were not managed in resus
- were initially managed in resus
- were re-triaged to resus

1.3 Patients with major trauma (ISS > 15) should be attended by an Emergency Medicine (EM) Consultant within one hour of attendance.

Standard Evidence: Expert opinion.

Case Selection: Patients with an ISS > 15

Measure: Number and percentage of major trauma patients for whom there was evidence that the following attended in the ED:

- no Consultant
- EM Consultant
- Non EM Consultant

1.4 Patients with major trauma (ISS > 15) should be monitored using a number of methods.

Standard Evidence: Expert opinion strongly supports ensuring that peripheral saturation of oxygen >90% is maintained during resuscitation for a wide variety of conditions including head and thoracic trauma (BTS 2008). Expert opinion supports 12 lead ECG recording to stratify risk for management of myocardial contusion. It is not sensitive, but abnormal initial ECG is associated with increased complications.

Case Selection: Patients with an ISS between 16 and 75.

Measure: Number and percentage of major trauma patients who:

a) did not have a peripheral oxygen saturation measured in ED had a peripheral oxygen saturation measured in ED

b) did not have blood gases measured in ED had blood gases measured in ED

c) did not have a 12 lead ECG performed in ED had a 12 lead ECG performed in ED

d) did not have EWS chart or resuscitation room physiological observation chart commenced in ED
had EWS or resuscitation room physiological observation chart commenced in ED

2015 QI update

a, c and d are no longer monitored as the compliance was continuously high and it was agreed that they were embedded in practice.

2. Abdominal Injury

2.1 Patients with an abdominal injury of AIS >= 3 should be attended by a Consultant surgeon within one hour of attendance.

Standard Evidence: Expert opinion and RCS/BOA Standard 13.4 'an immediate response from a senior general surgeon of sufficient experience to perform life-saving emergency laparotomy is essential'.

Case Selection: Patients with an abdominal injury of AIS >= 3.

Measure: Number and percentage of patients with abdominal injury AIS ≥3 seen by a Consultant surgeon in the ED:

- at no point prior to leaving ED
- prior to leaving ED but not within one hour of attendance
- within one hour of attendance at the ED

2.2 Patients with signs of shock (SBP < 90 on attendance) and an abdominal injury AIS >= 3 should have a laparotomy commenced and/or an abdominal/pan CT scan within one hour of attendance.

Standard Evidence: An immediate response from a senior general surgeon of sufficient experience to perform life-saving emergency laparotomy is essential (RCS/BOA Standard 13.4). In patients with signs of shock this should occur less than one hour from attendance to hospital Tai et al (2).

Case Selection: Patients with an abdominal injury of AIS >= 3 who have SBP < 90mm Hg recorded within first hour of attendance.

Measure: Number and percentage of patients with abdominal injuries of AIS ≥3 who had a SBP < 90mmHg on attendance and who:

- had either an abdomen/pan CT or a laparotomy within one hour of attendance at the ED
- had either an abdomen/pan CT or a laparotomy but neither within one hour of attendance at the ED
- had neither abdomen/pan CT or a laparotomy

Note: this indicator has additional information provided in parts 1 & 2 to describe the multiple interventions a patient may or may not have received.

2.3 Patients who have a laparotomy for an abdominal injury should have the laparotomy commenced within one hour of attendance.

Standard Evidence: Where visceral injury requires operative management the start of the operation must be possible within 60 minutes of admission in all cases (RCS/BOA Standard 13.4). Expert opinion suggests that the upper limit of this time frame should be two hours from injury to surgical intervention.

Case Selection: Patients with an abdominal visceral injury and a laparotomy.

Measure: Number and percentage of patients with an AIS abdominal visceral injury who:

- had a laparotomy greater than two hours from attendance
- had a laparotomy within one hour of attendance
- had a laparotomy between one and two hours of attendance

3. Thoracic Injury

3.1 Patients with a thoracic injury of AIS ≥2 should have a chest x-ray within 30 minutes of attendance.

Standard Evidence: Expert opinion suggests that chest imaging has obvious importance in managing major trauma patients with thoracic injury and is likely to be a marker on the level of organisation/function of a trauma response.

Case Selection: Patients with thoracic injury of AIS ≥ 2.

Measure: Number and percentage of patients with thoracic injuries of AIS ≥2 who:

- no chest x-ray whilst under the care of ED
- had a chest x-ray but not within 30 minutes of attendance at the ED
- had a chest x-ray within 30 minutes of attendance at the ED

3.2 Patients with a thoracic injury of AIS ≥2 should have a chest CT scan within one hour of attendance.

Standard Evidence: Expert opinion suggests that chest imaging has obvious importance in managing major trauma patients with thoracic injury and is likely to be a marker for the level or organisation/function of a trauma response.

Case Selection: Patients with a thoracic injury of AIS ≥2.

Measure: Number and percentage of patients with thoracic injury of AIS >2 who:

- did not have a chest/PAN CT whilst under the care of ED
- had a chest/PAN CT but not within one hour of attendance at the ED
- had a chest/PAN CT within one hour of attendance at the ED

4. Head Injury

4.1 Patients with a head injury should have a Glasgow Coma Score (GCS) recorded on attendance.

Standard Evidence: The GCS is a key factor for determining the appropriate investigation and management of the head injured patient. SIGN 110 recommends the use of GCS in the assessment of all head injured patients.

Case selection: Patients who have a head injury

Measure: Number and percentage of patients who had a head injury and had:

- No GCS available
- GCS available, within an hour of attendance at ED
- GCS available on attendance, but no breakdown (E,V and M)
- Total GCS and breakdown available on attendance

2015 QI update

This is no longer monitored as the compliance was continuously high and it was agreed that it was embedded in practice.

4.2 Patients with a reduced conscious level (GCS <= 12) and/or a base of or depressed skull fracture should have a head CT scan within one hour of attendance.

Standard Evidence: All patients who have (1) high risk signs of brain injury should have immediate CT scanning and (2) those with medium risk should have a CT scan within eight hours (SIGN 110).

Case Selection: Patients with a base of or depressed skull fracture and/or who have GCS <= 12 recorded within first hour of attendance.

Measure: Number and percentage of patients with GCS ≤ 12 and/or with base of or depressed skull fracture who:

- did not have a head CT scan whilst under the care of ED
- had a head CT scan prior to leaving the ED
- had a head CT scan within one hour of attendance at the ED

4.3 Patients with a severe head injury (AIS >= 3) should be transferred (if no onsite availability) to a setting with 24-hour on-site access to a Neuro Intensive Care Unit (NICU), regardless of whether surgical intervention is required.

Standard Evidence: Patients with a severe head injury, focal signs or requiring intra cranial pressure monitoring (ICPM) should be transferred to the care of neurosurgery unit regardless of whether they need surgical intervention (RCS/BOA Standard 13.2). All salvageable patients with severe head injury (GCS less than or equal to 8) should be transferred to, and treated in, a setting with 24-hour neurological ICU facility (SIGN 110).

Case Selection: Patients with a head injury of AIS >= 3.

Measure: Number and percentage of patients with head injury AIS ≥3 who:

- Were not admitted / transferred to area with 24 hour on-site access to NICU.
- were not admitted/transferred but were discussed with Neuro before leaving ED
- were admitted / transferred to area with 24 hour on-site access to NICU

5. Spinal Injury

5.1 The management of patients with spinal injuries AIS >= 3 should be referred /discussed with the Spinal Injuries Unit (SIU) at the Queen Elizabeth University Hospital, Glasgow, before leaving the first receiving STAG ED.

Standard Evidence: Immediate referral must be made to the appropriate spinal injury service if there is evidence of partial or complete spinal cord or cauda equina lesion (RCS/BOA Standard 13.5).

Case Selection: Patients with a spinal cord/cauda equina injury of AIS >= 3.

Measure: Number and percentage of patients with spinal cord injury AIS ≥3 who:

- were not referred/discussed with the Spinal Injuries Unit prior to leaving the ED
- were referred/discussed with the Spinal Injuries Unit prior to leaving the ED

6. Limb Fractures

6.1 Patients with open limb fractures should receive IV antibiotics within one hour of attendance.

Standard Evidence: All patients with high energy open fractures should receive the following care; IV antibiotics are administered ASAP ideally within 3 hours of injury and the wound, soft tissue and bone excision (debridement) is performed by senior plastic and orthopaedic surgeons working together on scheduled trauma operating lists within normal working hours and within 24 hours of the injury (2009 BOA/BAPRAS Indicators for the Management of Open Lower Limb Fractures).

Case Selection: Patients with an open limb fracture (not including hands or feet).

Measure: Number and percentage of patients with open limb fractures who:

- did not receive IV antibiotics prior to leaving the ED
- received IV antibiotics prior to leaving the ED
- received IV antibiotics within one hour of attendance at the ED

6.2 Patients with open limb fractures should be surgically managed by a consultant orthopaedic and/or plastic surgeon within 24 hours of attendance.

Standard Evidence: All patients with high energy open fractures should receive the following care; IV antibiotics are administered ASAP ideally within 3 hours of injury and the wound, soft tissue and bone excision (debridement) is performed by senior plastic and orthopaedic surgeons working together on scheduled trauma operating lists within normal working hours and within 24 hours of the injury (2009 BOA/BAPRAS Indicators for the Management of Open Lower Limb Fractures).

Case Selection: Patients with an open limb fracture (not including hands or feet).

Measure: Number and percentage of patients with open limb fractures who:

- Attended theatre for an orthopaedic procedure but not within 24 hrs of attendance.
- attended theatre for an orthopaedic procedure within 24 hours of attendance at the ED where the:
  - procedure was carried out by a consultant surgeon
  - procedure was carried out, but not by a consultant surgeon

7. Pelvic Fractures

7.1 Patients with unstable pelvic fractures should have a pelvic binder applied within 30 minutes of attendance.

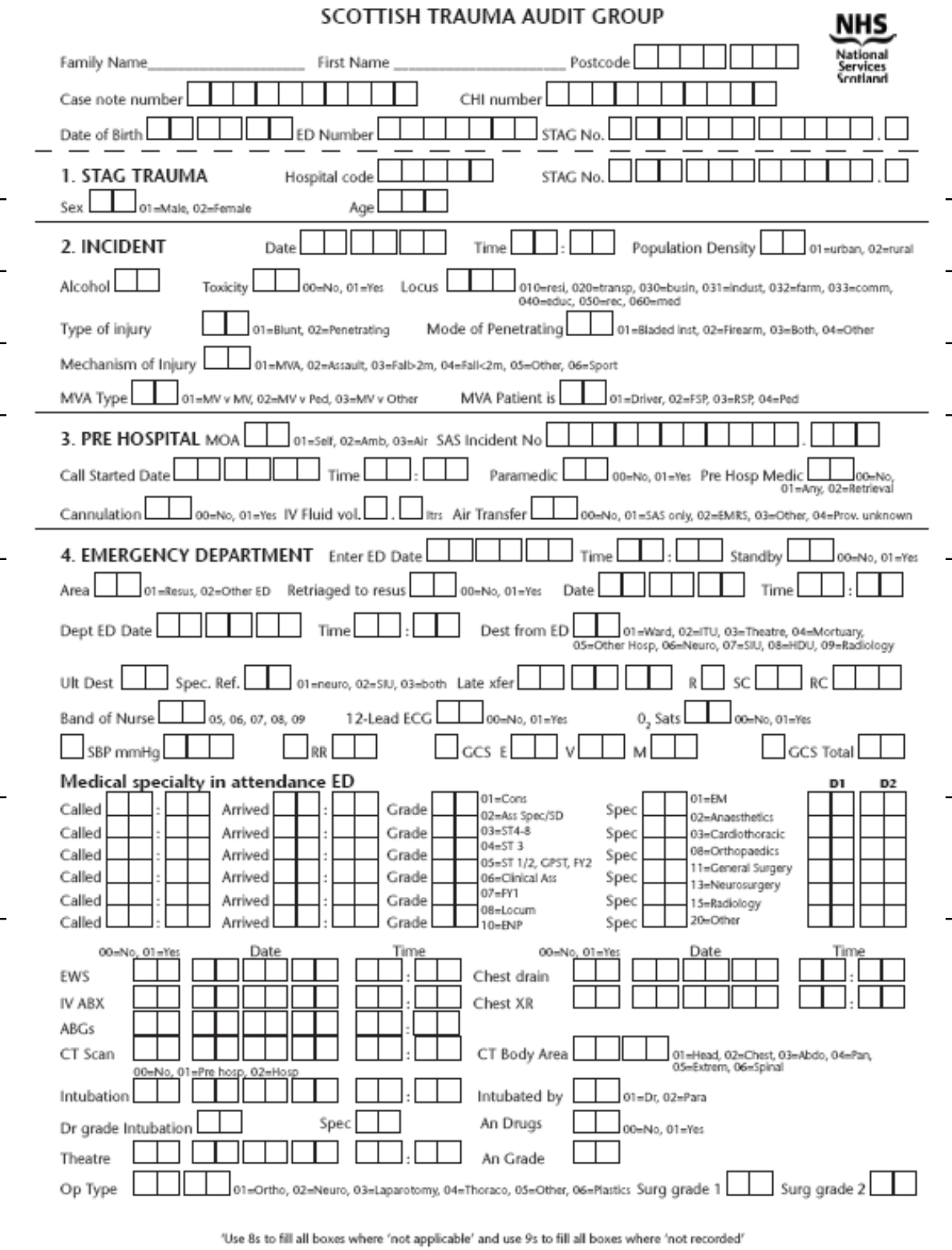
Standard Evidence: Expert opinion and BOAST 3 2008 (Pelvic and Acetabular Fracture Management).

Case Selection: Patients with AIS Codes 85616x.x and 85617x.x.

Measure: Number and percentage of patients with unstable pelvic fractures who:

- did not have a binder applied
- had a binder applied prior to arrival at ED
- had a binder applied within 30 minutes of attendance at the ED
- had a binder applied prior to leaving the ED

Appendix 1 – Pro forma (V5.0)



SCOTTISH TRAUMA AUDIT GROUP

NHS National Services Scotland

Family Name_____ First Name _____ Postcode

Case note number CHI number

Date of Birth ED Number STAG No.

1. STAG TRAUMA Hospital code STAG No.

Sex 01=Male, 02=Female Age

2. INCIDENT Date Time : Population Density 01=urban, 02=rural

Alcohol Toxicity 00=No, 01=Yes Locus 010=resi, 020=transp, 030=busin, 031=indust, 032=farm, 033=comm, 040=educ, 050=rec, 060=med

Type of injury 01=Blunt, 02=Penetrating Mode of Penetrating 01=Bladed inst, 02=Firearm, 03=Both, 04=Other

Mechanism of Injury 01=MVA, 02=Assault, 03=Fall>2m, 04=Fall<2m, 05=Other, 06=Sport

MVA Type 01=MV v MV, 02=MV v Ped, 03=MV v Other MVA Patient is 01=Driver, 02=FSP, 03=RSP, 04=Ped

3. PRE HOSPITAL MOA 01=Self, 02=Amb, 03=Air SAS Incident No .

Call Started Date Time : Paramedic 00=No, 01=Yes Pre Hosp Medic 00=No, 01=Any, 02=Retrieval

Cannulation 00=No, 01=Yes IV Fluid vol. . ltrs Air Transfer 00=No, 01=SAS only, 02=EMRS, 03=Other, 04=Prov. unknown

4. EMERGENCY DEPARTMENT Enter ED Date Time : Standby 00=No, 01=Yes

Area 01=Resus, 02=Other ED Retriaged to resus 00=No, 01=Yes Date Time :

Dept ED Date Time : Dest from ED 01=Ward, 02=ITU, 03=Theatre, 04=Mortuary, 05=Other Hosp, 06=Neuro, 07=SIU, 08=HDU, 09=Radiology

Ult Dest Spec. Ref. 01=neuro, 02=SIU, 03=both Late xfer R SC RC

Band of Nurse 05, 06, 07, 08, 09 12-Lead ECG 00=No, 01=Yes 0_2 Sats 00=No, 01=Yes

SBP mmHg RR GCS E V M GCS Total

Medical specialty in attendance ED

					D1	D2
Called :	Arrived :	Grade	01=Cons, 02=Ass Spec/SD, 03=ST4-8, 04=ST 3, 05=ST 1/2, CPST, FY2, 06=Clinical Ass, 07=FY1, 08=Locum, 10=ENP	Spec	01=EM, 02=Anaesthetics, 03=Cardiothoracic, 08=Orthopaedics, 11=General Surgery, 13=Neurosurgery, 15=Radiology, 20=Other	
Called :	Arrived :	Grade		Spec		
Called :	Arrived :	Grade		Spec		
Called :	Arrived :	Grade		Spec		
Called :	Arrived :	Grade		Spec		
Called :	Arrived :	Grade		Spec		
Called :	Arrived :	Grade		Spec		

	00=No, 01=Yes	Date	Time		00=No, 01=Yes	Date	Time
EWS			:	Chest drain			:
IV ABX			:	Chest XR			:
ABGs			:				
CT Scan			:	CT Body Area	01=Head, 02=Chest, 03=Abdo, 04=Pan, 05=Extrem, 06=Spinal		
Intubation	00=No, 01=Pre hosp, 02=Hosp		:	Intubated by	01=Dr, 02=Para		
Dr grade Intubation		Spec		An Drugs	00=No, 01=Yes		
Theatre			:	An Grade			

Op Type 01=Ortho, 02=Neuro, 03=Laparotomy, 04=Thoraco, 05=Other, 06=Plastics Surg grade 1 Surg grade 2

'Use 8s to fill all boxes where 'not applicable' and use 9s to fill all boxes where 'not recorded'

STAG No. ☐☐☐☐☐☐☐☐☐☐.☐

5. INJURY SCORING

Region	1. Head & Neck	2. Face	3. Chest	4. Abdomen	5. Extremity	6. External	
Source	1. PM	2. CT	3. Surgery	4. MRI	5. X Ray	6. Clinical	7. USS

Injury Description	Region	AIS Code (AIS 98)	Score	Source
1.	☐	☐☐☐☐☐☐	☐	☐
2.	☐	☐☐☐☐☐☐	☐	☐
3.	☐	☐☐☐☐☐☐	☐	☐
4	☐	☐☐☐☐☐☐	☐	☐
5.	☐	☐☐☐☐☐☐	☐	☐
6.	☐	☐☐☐☐☐☐	☐	☐
7.	☐	☐☐☐☐☐☐	☐	☐
8.	☐	☐☐☐☐☐☐	☐	☐
9.	☐	☐☐☐☐☐☐	☐	☐
10.	☐	☐☐☐☐☐☐	☐	☐
11.	☐	☐☐☐☐☐☐	☐	☐
12.	☐	☐☐☐☐☐☐	☐	☐
13.	☐	☐☐☐☐☐☐	☐	☐
14.	☐	☐☐☐☐☐☐	☐	☐
15.	☐	☐☐☐☐☐☐	☐	☐
16.	☐	☐☐☐☐☐☐	☐	☐
17.	☐	☐☐☐☐☐☐	☐	☐
18.	☐	☐☐☐☐☐☐	☐	☐

Open limb ☐☐ 00=No, 01=Yes Additional Injuries? ☐☐ 00=No, 01=Yes ISS Score ☐☐

6. OUTCOMES

☐☐ 00=Dead, 01=Alive DOD ☐☐☐☐☐☐ Local audit ☐☐☐☐☐☐ 00=No, 01=ED, 02=Post ED, 03=Operative, 04=Transfer, 05=Other

LOS (days) Total ☐☐ days ITU ☐☐ Neuro ITU ☐☐ SIU ☐☐ HDU ☐☐

First Critical Care admission wwunit code ☐☐☐☐☐ ww epikey ☐☐☐☐☐☐☐

RP1 ☐☐ ☐☐☐☐☐☐ ☐☐:☐☐ RP2 ☐☐ ☐☐☐☐☐☐ ☐☐:☐☐

RP3 ☐☐ ☐☐:☐☐ RP4 ☐☐ ☐☐:☐☐

Comments

'Use 8s to fill all boxes where 'not applicable' and use 9s to fill all boxes where 'not recorded'

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