RAIN Risk Adjustment In Neurocritical care

Data Collection Manual

Version 1.6

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General rules for data collection

Inclusion criteria

- all adult patients (aged 16 years or over) admitted to participating critical care units following acute TBI, and with a GCS<15 following resuscitation
- TBI is a brain injury resulting from mechanical trauma, whether or not a patient has a TBI is a clinical decision
- include both suspected and known TBI

Data

Data are collected on all consecutive admissions meeting the inclusion criteria. Data are collected for readmissions as for a new admission. Data are collected for the same time period for all admissions - there are no exclusions and no exceptions.

Data that are measured and/or recorded in any part of the permanent written or electronic patient record are acceptable, for example, data from charts, case notes or any medium that comprises the permanent patient record. This is based on the assumption that all clinically important information is documented. Such an assumption is the only realistic standardisation possible at this time.

In specifying and defining the dataset, judgements have had to be made. It is recognised that such judgements will not comply with all opinions. It should, be emphasised, however, that it is better to comply with rules and definitions which you deem incorrect than to substitute personal rules and/or definitions.

Missing data

If data are not available or are missing, then no value should be entered. It is not the aim of the RAIN Study to encourage unnecessary investigations.

Do not enter guesses or fabricated data. Where data are missing, these fields should be left blank. The value “0” must not be used to indicate missing numeric data.

Data collection time periods

- **Patient**:
  - these fields specify patient details for six-month follow-up and data linkage to the Case Mix Programme, where relevant

- **TBI pre-hospital**:
  - data are collected for the period prior to attendance at the first hospital for this TBI

- **Source**:
  - data describing the route to the critical care unit are collected for the period from attendance at the first hospital for this TBI to admission to your unit

- **TBI at hospital**:
  - data are collected for the period from attendance at the first hospital for this TBI to discharge from hospital/death
  - values required are those first recorded – first recorded is defined as within 12 hours of attendance at the first hospital for this TBI

- **First CT**:
  - the results of the first CT scan performed after attendance at the first hospital for this TBI

- **Outcome**:
  - data are collected for the period from admission to your unit to discharge from hospital/death

- **GP**:
  - these fields specify information on the GP with whom this admission to your unit is registered

Additional information
[CMP: Text]

Field:	Additional information
Number of data items:	One
Options:	None

Definition for collection:

- any additional information considered relevant to this admission
- text data entered in this field may provide extra information about data entered elsewhere for a specific field in the dataset or may provide extra information on the admission which is not collected as part of the dataset
- entry of data in the text field is not compulsory
- no identifiers (patient, nurse, doctor, unit, hospital) should be included in text data entered into this field
- information entered in the text field may derive from any time period during data collection
- space for comments is limited, please restrict comments to clarification of data entered and comments to facilitate data validation

Justification

Despite best intentions and endeavours, no dataset can be completely comprehensive and unequivocally objective, information provided in this field will enable the dataset to be improved over time

Basal cisterns

Field:	Basal cisterns
Number of data items:	One
Options:	**A**bsent **C**ompressed **P**resent

Definition for collection:

- specifies the appearance of the basal cisterns on the first CT scan following the TBI
- first CT scan is defined as the first CT scan performed after attendance at the first hospital for this TBI
- where there is more than one CT scan performed, the first CT scan must be used for data abstraction; if transferred, the first CT scan may be performed at a subsequent hospital
- **A**bsent indicates the basal cisterns are not visible on the first CT scan
- **C**ompressed indicates the basal cisterns appear compressed on the first CT scan
- **P**resent indicates the basal cisterns appear normal on the first CT scan

Justification

Required for risk prediction models

Brainstem pathology present

Field:	Brainstem pathology present
Number of data items:	One
Options:	**Y**es **N**o

Definition for collection:

- specifies if a brainstem pathology was present on the first CT scan following the TBI
- first CT scan is defined as the first CT scan performed after attendance at the first hospital for this TBI
- where there is more than one CT scan performed, the first CT scan must be used for data abstraction; if transferred, the first CT scan may be performed at a subsequent hospital
- **Y**es indicates brainstem pathology; this includes evidence of brainstem compression, contusion, haemorrhage or ischaemia
- **N**o indicates no brainstem pathology

Justification

Required for risk prediction models

Cardiovascular support days

Fields:	Basic cardiovascular support days Advanced cardiovascular support days
Number of data items:	Two
Units of measurement:	Calendar days

Definition for collection:

- specifies the number of calendar days during which the admission received any basic or advanced cardiovascular support whilst on your unit
- a calendar day is defined as any complete calendar day (00:00-23:59) or part thereof, e.g. a patient admitted on 1 January 2006 at 23:45 and discharged on 3 January 2006 at 00:10 would be recorded as having received three calendar days of care
- record 1, 2, 3 etc for one, two, three etc calendar days; record 998 for 998 or more calendar days; record 999 for support occurring but number of days not known
- Advanced Cardiovascular - indicated by one or more of the following:
    - admissions receiving multiple intravenous and/or rhythm controlling drugs (e.g. inotropes, nitrates etc.) (of which, at least one must be vasoactive) when used simultaneously to support or control arterial pressure, cardiac output or organ/tissue perfusion
    - admissions receiving critical care after resuscitation following cardiac arrest (not usually valid for longer than one calendar day after day of resuscitation)
    - admissions receiving continuous observation of cardiac output and other indices (e.g. with a pulmonary artery catheter, lithium dilution, pulse contour analyses, oesophageal doppler etc.)
    - admissions with an intra aortic balloon pump in place and other assist devices
    - admissions with a temporary cardiac pacemaker (valid each day while connected for therapeutic reasons to a functioning external pacemaker unit)
- Basic Cardiovascular - indicated by:
    - admissions with a CVP (central venous pressure) receiving monitoring or for central venous access to deliver titrated fluids to treat hypovolaemia
    - admissions with an arterial line receiving monitoring of arterial pressure and/or sampling of arterial blood
    - admissions receiving a single, intravenous, vasoactive drug to support or control arterial pressure, cardiac output or organ perfusion
    - admissions receiving single/multiple intravenous rhythm controlling drug(s) to control cardiac arrhythmias

- admissions receiving non-invasive measurement of cardiac output and other indices (e.g. with echocardiography, thoracic impedance etc.)

- Note: If advanced and basic cardiovascular monitoring and support occur simultaneously, then only advanced cardiovascular monitoring and support should be recorded.

Justification

Required to describe organs supported

Cause of TBI

Field:	Cause of TBI
Number of data items:	One
Options:	**R**oad traffic accident **F**all **A**ssault **O**ther **U**nknown

Definition for collection:

- specifies the documented cause of TBI
- **R**oad traffic accident is when the TBI is caused by any accident involving a vehicle (e.g. car, motorcycle, bike, etc.) to a driver, passenger, pedestrian etc.
- **F**all is when the TBI is caused by a fall from any height and includes tripping or slipping (e.g. on pavement etc.)
- **A**ssault is when the TBI is caused by a violent physical attack
- **O**ther is when the TBI cause is known but none of the above
- **U**nknown is when the cause is not known

Justification

Required for description of TBI

Classification of surgery

Field:	Classification of surgery
Number of data items:	One
Options	e**M**ergency **U**rgent **S**cheduled e**L**ective

Definition for collection:

- specifies whether the admission, whose Direct source was Theatre & recovery, was following emergency, urgent, scheduled or elective surgery
- surgery is defined as undergoing all or part of a surgical procedure or anaesthesia for a surgical procedure in an operating theatre or an anaesthetic room
- e**M**ergency surgery is defined as immediate surgery, where resuscitation (stabilisation and physiological optimisation) is simultaneous with surgical treatment and where surgery normally takes place within minutes of decision to operate
- **U**rgent surgery is defined as surgery as soon as possible after resuscitation (stabilisation and physiological optimisation) and normally takes place within hours of decision to operate
- **S**cheduled surgery is defined as early surgery but not immediately life-saving and normally takes place within days of decision to operate
- e**L**ective surgery is defined as surgery at a time to suit both patient and surgeon and is booked in advance of routine admission to hospital
- elective surgery initially postponed can subsequently become emergency, urgent or scheduled surgery
- organ harvesting is not considered surgery

Justification

Required to describe admission with TBI

CMP Admission number (or SICSAG key)

Field:	CMP Admission number (or SICSAG key)
Number of data items:	One
Units of measurement:	None

Definition for collection:

- unique number assigned to each admission to your unit
- value should be automatically generated by your CMP software application as each admission record is created and should be inputted on the RAIN secure, web-based data entry system
- use the SICSAG key generated by your Wardwatcher software application in Scotland
- admission to your unit is defined as the physical admission and the recording of that admission to a bed in your unit

Justification

Provides data linkage with CMP

Contact telephone number

Field:	Contact telephone number
Number of data items:	One

Definition for collection:

- specifies the contact telephone number, including area code for this admission to your unit

Justification

Required for the six-month follow-up of admission with TBI

Date of birth

Fields:	Date of birth Date of birth estimated
Number of data items:	Two
Units of measurement:	Date dd/mm/yyyy
Options:	Date of birth estimated – **Y**es or **N**o

Definition for collection:

- specifies date of birth for this admission to your unit
- if date of birth is unobtainable, then use judgement to estimate year of birth and record as 1 January of estimated year i.e. 01/01/yyyy
- if 01/01/yyyy, then record whether date of birth is estimated or not

Justification

Required for risk prediction models

Date of discharge from critical care

[CMP: Date of ultimate discharge from ICU/HDU]

Field:	Date of discharge from critical care
Number of data items:	One
Units of measurement:	Date dd/mm/yyyy

Definition for collection:

- specifies the latest documented date on which this admission was ultimately discharged from adult critical care, the critical care having been continuous since discharge from your unit
- ultimate discharge is defined as the physical discharge and recording of that discharge from a bed in another critical care unit
- a critical care unit is defined as an ICU or a combined ICU/HDU or an HDU
- where more than one date of ultimate discharge from critical care is documented, the latest documented date is recorded
- the date is not necessarily the date of discharge from the unit to which the admission was transferred from your unit

Justification

Required to describe admission with TBI

Date of discharge from your hospital

Field:	Date of discharge from your hospital
Number of data items:	One
Units of measurement:	Date dd/mm/yyyy

Definition for collection:

- specifies the date of discharge of the admission from your hospital
- date of discharge from your hospital is the latest documented date of the admission being physically within an acute in-patient bed in your hospital or the date of death in your hospital
- discharge from your hospital is defined as the physical discharge and recording of that discharge from an acute in-patient bed in your hospital
- where more than one date of discharge from your hospital is documented, the latest documented date is recorded

Justification

Required to describe admission with TBI

Date/Time of admission to your unit

Fields:	Date of admission to your unit Time of admission to your unit
Number of data items:	Two
Units of measurement:	Date dd/mm/yyyy Time hh:mm

Definition for collection:

- specifies the date and time of admission to your unit
- admission to your unit is defined as the physical admission and recording of that admission to a bed in your unit
- date of admission to your unit is the earliest documented date of the admission being physically in a bed in your unit
- time of admission to your unit may be the time first charted if not documented as earlier in the case notes (twenty-four hour clock)
- where more than one date/time of admission to your unit is documented, the earliest documented date/time is recorded

Justification

Required to describe admission with TBI

Date/Time of attendance at/admission to your hospital

Field:	Date of attendance at/admission to your hospital Time of attendance at/admission to your hospital
Number of data items:	Two
Units of measurement:	Date dd/mm/yyyy Time hh:mm

Definition for collection:

- specifies the date and time the admission first attended or was admitted to your hospital
- attendance at hospital is defined as the physical attendance and recording of that attendance in your hospital, the hospital housing your unit
- admission to hospital is defined as the physical admission and recording of that admission to an acute in-patient bed in your hospital, the hospital housing your unit
- where more than one date of attendance at/admission to your hospital is documented, the earliest documented date and time is recorded
- hospital care in your hospital must be continuous up to the point of admission to your unit

Justification

Required to describe admission with TBI

Date/Time of death

Fields:	Date of death Time of death	
Number of data items:	Two	
Units of measurement:	Date	dd/mm/yyyy
	Time	hh:mm

Definition for collection:

- specifies the date and time of death including brainstem death
- date of death or brainstem death in your unit as documented in the admission's clinical record
- time of death or brainstem death in your unit as documented in the admission's clinical record (twenty-four hour clock)
- if brainstem death declared, then indicate the date on which the completion of the first set of tests confirming brainstem death is recorded (as per the current Department of Health (England) Statement on brainstem death)
- if brainstem death declared, then indicate the time at which the completion of the first set of tests confirming brainstem death is recorded (as per the current Department of Health (England) Statement on brainstem death), (twenty-four hour clock)

Justification

Required for risk prediction models

Date/Time of discharge from your unit

Fields:	Date of discharge from your unit Time of discharge from your unit
Number of data items:	Two
Units of measurement:	Date dd/mm/yyyy Time hh:mm

Definition for collection:

- specifies the date and time of the physical discharge of an admission and that recording of that discharge from a bed in your unit
- discharge does not include temporary transfer from your unit, e.g. for surgery, radiology, other investigation
- date of discharge from your unit is the latest documented date of the admission being physically in your unit
- time of discharge from your unit is the latest documented time of the admission being physically within your unit (twenty-four hour clock)
- where more than one date/time of discharge from your unit is documented, the latest date/time is recorded

Justification

Required to describe admission with TBI

Date/Time of original admission to critical care

Field:	Date of original admission to critical care Time of original admission to critical care
Number of data items:	Two
Units of measurement:	Date dd/mm/yyyy Time hh:mm

Definition for collection:

- specifies the earliest documented date and time on which this admission was originally admitted to an adult critical care unit and since when adult critical care has been continuous
- a critical care unit is defined as an ICU or a combined ICU/HDU or an HDU
- the date is not necessarily the date of admission to the critical care unit from which this admission has been transferred to your unit
- admission is defined as the physical admission and recording of that admission to a bed in the critical care unit
- where more than one date of original admission to critical care is documented, the earliest documented date is recorded

Justification

Required to describe admission with TBI

Date/Time of original attendance at/admission to acute hospital

Field:	Date of original attendance at/admission to acute hospital Time of original attendance at/admission to acute hospital
Number of data items:	Two
Units of measurement:	Date dd/mm/yyyy Time hh:mm

Definition for collection:

- specifies the earliest documented date and time on which this admission originally attended or was admitted to the first acute hospital for the current period of continuous in-patient treatment
- an acute hospital is defined as any hospital providing a range of acute hospital services to diagnose, treat and care for seriously ill or injured patients; some acute hospitals may provide only specialist services while others will provide general services
- attendance at acute hospital is defined as the physical attendance and recording of that attendance in another acute hospital, not your hospital i.e. not the hospital housing your unit
- admission to acute hospital is defined as the physical admission and recording of that admission to an acute in-patient bed in another acute hospital, not your hospital i.e. not the hospital housing your unit
- the date is not necessarily the date of attendance at/admission to the acute hospital from which the admission has been transferred to your unit
- where more than one date of original attendance at/admission to at an acute hospital is documented, the earliest documented date is recorded

Justification

Required to describe admission with TBI

Date/Time of TBI

Fields:	Date of TBI Date of TBI estimated Time of TBI Time of TBI estimated
Number of data items:	Four
Units of measurement:	Date dd/mm/yyyy Time hh:mm
Options:	Date of TBI estimated – **Y**es or **N**o Time of TBI estimated – **Y**es or **N**o

Definition for collection:

- specifies the date and time of TBI
- date of TBI is the documented date of TBI
- time of TBI is the documented time of TBI
- if the date and/or time of TBI is imprecise, then use judgement to estimate the date and/or time and record whether the date and/or time of TBI is estimated

Justification

Required for risk prediction models

Date/Time when fully ready to discharge

Fields:	Date when fully ready to discharge Time when fully ready to discharge	
Number of data items:	Two	
Units of measurement:	Date	dd/mm/yyyy
	Time	hh:mm

Definition for collection:

- specifies the date and time when the admission was declared fully clinically ready for discharge
- the documented date when the admission was declared fully clinically ready for discharge
- the documented time when the admission was declared fully clinically ready for discharge (twenty-four hour clock)
- includes the documented date/time when a formal request was made to the appropriate staff with authority to admit at the intended destination (e.g. hospital bed management system, PICU staff for retrieval, transfer for more-specialist care etc.)
- where discharge planning occurs in the expectation of, and in advance of, the admission being fully clinically ready for discharge – the latter date/time when fully clinically ready is recorded
- where more than one date/time when fully ready to discharge is documented, the earliest documented date/time is recorded
- where date/time when fully ready to discharge equals date/time of discharge from your unit, enter the same values for both dates and times
- these fields should be left blank for admissions discharged early or where date/time when fully ready to discharge is not recorded

Justification

Required to describe admission with TBI

Dependency prior to admission to acute hospital

Field:	Dependency prior to admission to acute hospital
Number of data items:	One
Options:	**A**ble to live without assistance in daily activities mi**N**or assistance with some daily activities ma**J**or assistance with majority of/all daily activities **T**otal assistance with all daily activities

Definition for collection:

- specifies what the admission could do before the TBI
- assess as best description for the dependency of this admission in the two weeks prior to admission to acute hospital and prior to the TBI, i.e. “usual” dependency
- **A**ble – receives no assistance with daily activities
- mi**N**or – receives some assistance with some daily activities
- ma**J**or – receives considerable assistance with majority of/all daily activities
- **T**otal – receives total assistance with all daily activities
- assistance means personal assistance
- daily activities include bathing, dressing, going to the toilet, moving in/out of bed/chair, continence and eating
- it is recognised that these data are subjective, the important distinction is between total independence (able to live without assistance in daily activities), some level of dependence (minor/major limitations) and total dependence (total assistance with all daily activities) – the difference between minor or major assistance in daily activities is difficult to standardise and this lack of specificity is acknowledged

Justification

Required to describe admission with TBI

Dermatological support days

Field:	Dermatological support days
Number of data items:	One
Units of measurement:	Calendar days

Definition for collection:

- specifies the number of calendar days during which the admission received any dermatological support whilst on your unit
- a calendar day is defined as any complete calendar day (00:00-23:59) or part thereof, e.g. a patient admitted on 1 January 2006 at 23:45 and discharged on 3 January 2006 at 00:10 would be recorded as having received three calendar days of care
- record 1, 2, 3 etc for one, two, three etc calendar days; record 998 for 998 or more calendar days; record 999 for support occurring but number of days not known
- Dermatological – indicated by one or more of the following:
    - admissions with major (e.g. greater than 30% body surface area affected) skin rashes, exfoliation or burns
    - admissions receiving complex dressings (e.g. major – greater than 30% body surface area affected – skin dressings, open abdomen, vacuum dressings or large – multiple limb or limb and head – trauma dressings)

Justification

Required to describe organs supported

Destination post-discharge

[CMP: Destination post-discharge from your hospital]

Field:	Destination post-discharge
Number of data items:	One
Options:	other **A**cute hospital n**O**n-acute hospital **N**ot in hospital

Definition for collection:

- specifies the destination to which the admission was directly transferred post-discharge from your hospital, the hospital housing your unit
- other **A**cute hospital, one that does not house your unit, is defined as another hospital (can be in the same or a different NHS Trust) that provides a range of acute hospital services to diagnose, treat and care for seriously ill or injured patients; some acute hospitals may provide only specialist services while others will provide general services
- n**O**n-acute hospital is defined as another hospital (can be in the same or a different NHS Trust) that provides a range of short or long-term non-acute services
- **N**ot in hospital is defined as discharge to a location that is no longer within a hospital

Justification

Required to describe admission with TBI

Diagnosis of TBI confirmed

Field:	Diagnosis of TBI confirmed
Number of data items:	One
Options:	**Y**es **N**o

Definition for collection:

- specifies whether the admission had a TBI
- TBI is defined as a brain injury resulting from mechanical trauma

Justification

Required for risk prediction models

Direct source

[CMP: Location (in)]

Field:	Direct source
Number of data items:	One
Options:	**W**ard o**B**stetrics area other inter**M**ediate care area **P**aediatric ICU/HDU level 3 bed in adult **I**CU or ICU/HDU level 2 bed in adult ICU or ICU/**H**DU adult HD**U** **T**heatre & recovery accident & **E**mergency **R**ecovery only ima**G**ing department **S**pecialist treatment area **C**linic **N**ot in hospital

Definition for collection:

- specifies the direct source from which this admission was admitted directly to your unit
- **W**ard is a ward in the hospital
- o**B**stetrics area is a delivery suite, labour ward or obstetrics ward in the hospital
- other inter**M**ediate care area is a CCU or other area in the hospital where the level of care is greater than the normal ward but is not an ICU or combined ICU/HDU or HDU (use text box to specify where)
- **P**aediatric ICU/HDU is a paediatric ICU or combined ICU/HDU or HDU in the hospital
- level 3 bed in adult **I**CU or ICU/HDU is a level 3 bed in either an adult ICU or a combined ICU/HDU in the hospital
- level 2 bed in adult ICU or ICU/**H**DU is a level 2 bed in either an adult ICU or a combined ICU/HDU in the hospital
- adult HD**U** is an adult HDU or equivalent step-up/step-down unit in the hospital, where the Critical Care Minimum Data Set (CCMDS) is collected
- **T**heatre and recovery is a theatre in the hospital, the admission having undergone all or part of a surgical procedure or anaesthesia for a surgical procedure
- accident & **E**mergency is an accident & emergency department in the hospital

- **R**ecovery only is a recovery room used as a temporary critical care facility
- ima**G**ing department is an X-ray, CT, MRI, PET or other department in the hospital dedicated to providing diagnostic imaging or interventional radiology
- **S**pecialist treatment area includes endoscopy and catheter suites in the hospital
- **C**linic is defined as an out-patient or other clinic in the hospital
- **N**ot in hospital is defined as not in hospital

Justification

Required to describe admission with TBI

Discharge location

[CMP: Hospital housing location (out)]

Field:	Discharge location
Number of data items:	One
Options:	**S**ame hospital other **A**cute hospital n**O**n-acute hospital

Definition for collection:

- specifies the hospital housing the destination to which this admission was discharged from your unit
- **S**ame hospital is defined as the hospital that houses your unit
- other **A**cute hospital, one that does not house your unit, is defined as another hospital (can be in the same or a different NHS Trust) that provides a range of acute hospital services to diagnose, treat and care for seriously ill or injured patients; some acute hospitals may provide only specialist services while others will provide general services
- n**O**n-acute hospital is defined as another hospital (can be in the same or a different NHS Trust) that provides a range of short or long-term non-acute services

Justification

Required to describe admission with TBI

Discharged to

[CMP: Location (out)]

Field:	Discharged to
Number of data items:	One
Options:	**W**ard o**B**stetrics area other inter**M**ediate care area **R**ecovery only **P**aediatric ICU/HDU level 3 bed in adult **I**CU or ICU/HDU level 2 bed in adult ICU or ICU/**H**DU adult HD**U** **N**ot in hospital

Definition for collection:

- specifies the destination to which this admission was discharged from your unit
- **W**ard is a ward in the hospital
- o**B**stetrics area is a delivery suite, labour ward or obstetrics ward in the hospital
- other inter**M**ediate care area is a CCU or other area where the level of care is greater than the normal ward but is not an ICU or combined ICU/HDU or HDU (use text box to specify where)
- **R**ecovery only is a recovery room used as a temporary critical care facility
- **P**aediatric ICU/HDU is a paediatric ICU or ICU/HDU or HDU in the hospital
- level 3 bed in adult **I**CU or ICU/HDU is a level 3 bed in either an adult ICU or a combined ICU/HDU in the hospital
- level 2 bed in adult ICU or ICU/**H**DU is a level 2 bed in either an adult ICU or a combined ICU/HDU in the hospital
- adult HD**U** is an adult HDU or equivalent step-up/step-down unit in the hospital, where the Critical Care Minimum Data Set (CCMDS) is collected
- **N**ot in hospital is defined as discharge to a location that is no longer within a hospital

Justification

Required to describe admission with TBI

Evacuation of haematoma

Fields:	Evacuation of haematoma Evacuation of haematoma date Evacuation of haematoma time
Number of data items:	Three
Units of measurement:	Date dd/mm/yyyy Time hh:mm
Options:	Evacuation of haematoma – **Y**es or **N**o

Definition for collection:

- specifies if there was surgical evacuation of any haematoma after the first CT scan
- first CT scan is defined as the first CT scan performed after attendance at the first hospital for this TBI
- **Y**es indicates surgical evacuation of a haematoma after the first CT scan
- **N**o indicates no surgical evacuation of a haematoma after the first CT scan
- evacuation of haematoma date is the documented date the surgery commenced
- evacuation of haematoma time is the documented time the surgery commenced

Justification

Required for risk prediction models

Expected outcome at six months

Field:	Expected outcome at six months
Number of data items:	One
Options:	**G**ood recovery **M**oderate disability **S**evere disability **P**ersistent vegetative state **D**eath

Definition for collection:

- specifies the expected outcome of the admission six months following the TBI
- expected outcome should be determined at unit discharge by the consultant responsible for care at the point of discharge
- assess as best description for the expected outcome for this admission six months following the TBI (i.e. the predicted recovery)
- **G**ood recovery – expected resumption of normal life or expected resumption of normal life despite minor deficits
- **M**oderate disability – expected disabled but independent (i.e. might work in a sheltered setting etc.)
- **S**evere disability – expected conscious but disabled, dependent for daily support
- **P**ersistent vegetative state – expected minimal responsiveness
- **D**eath – expected non-survival

Justification

Required to describe admission with TBI

Fall height

Field:	Fall height
Number of data items:	One
Options:	**L**ess than or equal to two metres **G**reater than two metres **U**nknown height

Definition for collection:

- specifies height from which admission fell and includes tripping or slipping (e.g. on pavement etc.) and falling from a building, a high wall or bridge
- where fall was **L**ess than or equal to two metres; the height may be documented as explicit text allowing assessment of the height of fall
- where fall was **G**reater than two metres; the height may be documented as explicit text allowing assessment of the height of fall
- **U**nknown is when fall height not known

Justification

Required for description of TBI

First CT scan

Fields:	First CT scan available First CT scan date First CT scan time First CT scan Radiology Number
Number of data items:	Four
Units of measurement:	Date dd/mm/yyyy Time hh:mm
Options:	First CT scan available – **Y**es or **N**o

Definition for collection:

- specifies the availability, date, time and Radiology Number of the first CT scan following the TBI
- first CT scan is defined as the first CT scan performed after attendance at the first hospital for this TBI
- where there is more than one CT scan performed, the first CT scan must be used for data abstraction; if transferred, the first CT scan may be performed at a subsequent hospital
- if the first CT scan is available then indicate **Y**es, if not available then indicate **N**o
- first CT scan date is the documented date of the first CT scan
- first CT scan time is the documented time of the first CT scan
- first CT scan Radiology Number is the documented Radiology Number of the first CT scan

Justification

Required for risk prediction models

First CT scan assessed by/on

Fields:	First CT scan assessed by – specialty First CT scan assessed by – grade Date first CT scan assessed
Number of data items:	Three
Units of measurement:	Date dd/mm/yyyy
Options:	First CT scan assessed by – specialty – **C**ritical care, **N**eurocritical care, **E**mergency medicine, **A**naesthesia, Ne**U**roanaesthesia, **R**adiology, neur**O**radiology, **S**urgery or neurosur**G**ery First CT scan assessed by – grade – **C**onsultant, **S**pecialist registrar or **O**ther clinician

Definition for collection:

- specifies who assessed the first CT scan, following the TBI, for the RAIN Study and when this CT scan was assessed
- first CT scan is defined as the first CT scan performed after attendance at the first hospital for this TBI
- where there is more than one CT scan performed, the first CT scan must be used for data abstraction; if transferred, the first CT scan may be performed at a subsequent hospital
- first CT scan assessed by – specialty, specifies the area of expertise of the clinician that provided the data to input for the CT results for this admission
- first CT scan assessed by – grade, specifies the grade of the clinician that provided the data to input for the CT results for this admission
- date first CT scan assessed provides the date on which the clinician that provided the data to input for the CT results for this admission

Justification

Required for risk prediction models

First CT scan result

Field:	First CT scan result
Number of data items:	One
Options:	**A**bnormal **N**ormal

Definition for collection:

- specifies whether the first CT scan result following the TBI was normal or abnormal
- first CT scan is defined as the first CT scan performed after attendance at the first hospital for this TBI
- where there is more than one CT scan performed, the first CT scan must be used for data abstraction; if transferred, the first CT scan may be performed at a subsequent hospital
- **A**bnormal indicates the first CT scan result showed one or more abnormalities
- **N**ormal indicates the first CT scan result showed no abnormality

Justification

Acts as a filter field for CT findings

First recorded at hospital activated partial thromboplastin time (APTT) (ratio)

Fields:	First recorded at hospital APTT (ratio) or First recorded at hospital APTT missing
Number of data items:	Two
Units of measurement:	Ratio
Options:	First recorded at hospital APTT missing – **Y**es or **N**o

Definition for collection:

- specifies the first APTT from blood sampled within 12 hours of attendance at the first hospital for this TBI
- the APTT must be documented
- the first APTT may not be measured and recorded at the first hospital and, if transferred, may be measured and recorded at a subsequent hospital within 12 hours of attendance at first hospital for this TBI
- laboratory results only - laboratory results are defined as results of tests performed either in the departments of Clinical Chemistry or Haematology or in the near-patient testing/point of care testing laboratories with formal quality control programmes in operation
- record the APTT as a ratio
- if no blood was sampled for APTT measurement within 12 hours of being at or in the first hospital, then record APTT as missing

Justification

Required for risk prediction models

First recorded at hospital activated partial thromboplastin time (APTT) (seconds)

Fields:	First recorded at hospital APTT (seconds) First recorded at hospital APTT (seconds) or First recorded at hospital APTT missing
Number of data items:	Three
Units of measurement:	Seconds
Options:	First recorded at hospital APTT missing – **Y**es or **N**o

Definition for collection:

- specifies the first APTT from blood sampled within 12 hours of attendance at the first hospital for this TBI
- the APTT must be documented
- the first APTT may not be measured and recorded at the first hospital and, if transferred, may be measured and recorded at a subsequent hospital within 12 hours of attendance at first hospital for this TBI
- laboratory results only - laboratory results are defined as results of tests performed either in the departments of Clinical Chemistry or Haematology or in the near-patient testing/point of care testing laboratories with formal quality control programmes in operation
- record the APTT in seconds and the control time in seconds
- if no blood was sampled for APTT measurement within 12 hours of being at or in the first hospital, then record APTT as missing

Justification

Required for risk prediction models

First recorded at hospital arterial blood gas

Fields: First recorded at hospital PaO_2
Associated FiO_2
Associated $PaCO_2$
Associated pH/H^+
First at hospital arterial blood gas missing

Number of data items:	Five	
Units of measurement:	PaO_2	kPa or mmHg
	FiO_2	fraction
	$PaCO_2$	kPa or mmHg
	pH/H^+	pH or nmol l^{-1}

Options: First at hospital arterial blood gas missing – **Y**es or **N**o

---

Definition for collection:

- specifies the first arterial blood gas values measured and recorded within 12 hours of attendance at the first hospital for this TBI
- the arterial blood gas values must be documented
- the first arterial blood gas values may not be measured and recorded at the first hospital and, if transferred, may be measured and recorded at a subsequent hospital within 12 hours of attendance at first hospital for this TBI
- all values assessed and recorded from same arterial blood gas
- if no arterial blood gas values are measured and recorded, then record arterial blood gas as missing
- see Appendix: Table of FiO_2 approximations for non-intubated admissions receiving oxygen treatment

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Justification

Required for risk prediction models

First recorded at hospital blood pressure

Fields: First recorded at hospital systolic blood pressure
First recorded at hospital paired diastolic blood pressure

Number of data items: Two (one pair)
Units of measurement: mmHg

Definition for collection:

- specifies the first blood pressure measured and recorded within 12 hours of attendance at the first hospital for this TBI
- the first blood pressure may not be measured and recorded at the first hospital and, if transferred, may be measured and recorded at, or en route to (i.e. on the transfer form), a subsequent hospital within 12 hours of attendance at first hospital for this TBI
- record first at hospital systolic blood pressure measured and its paired diastolic blood pressure (i.e. values from same blood pressure measurement)
- blood pressure values are included irrespective of the measurement method used
- where blood pressure values are not detectable or measurable, the value zero should be recorded
- if only the systolic blood pressure value was measured and recorded (i.e. paired diastolic is missing), then enter this value

Justification

Required for risk prediction models

First recorded at hospital Glasgow Coma Score (GCS)

Fields:
- First recorded at hospital GCS recorded?
- First recorded at hospital total GCS
  - Associated eye component
  - Associated motor component
  - Associated verbal component
- Was this the last pre-sedation GCS?

Number of data items: Six
Units of measurement: None
Options:
- First recorded at hospital GCS recorded? – **Y**es or **N**o
- Was this the last pre-sedation GCS? – **Y**es or **N**o

Definition for collection:

- specifies the first pre-sedation GCS assessed and recorded within 12 hours of attendance at the first hospital for this TBI
- the first GCS may not be assessed and recorded at the first hospital and, if transferred, may be assessed and recorded at, or en route to (i.e. on the transfer form), a subsequent hospital within 12 hours of attendance at first hospital for this TBI
- if GCS assessed and recorded within 12 hours of attendance at the first hospital then indicate **Y**es, if not, then indicate **N**o
- all values assessed and recorded from the same assessment of the first total GCS following attendance at first hospital
- only GCS assessed when the admission is free from the effects of sedative and/or paralysing or neuromuscular blocking agents are valid
- the determination as to whether an admission is free from the effects of sedative and/or paralysing or neuromuscular blocking agents is left to clinical judgement, as this is the only realistic standardisation for collection of these data at this time
- admissions with self-sedation through deliberate or accidental overdose/poisoning should have a GCS assessed as seen
- the GCS may be either documented as a score (for example, as numbers) or as explicit text allowing precise assignment of the score (e.g. “fully alert and orientated” equals 15).
- see Appendix: How to assess the Glasgow Coma Score (GCS)
- indicate whether this was the most recent or last pre-sedation GCS recorded (i.e. is there another pre-sedation GCS recorded since this value?)

Justification

Required for risk prediction models

First recorded at hospital haemoglobin

Fields:	First recorded at hospital haemoglobin or First recorded at hospital haemoglobin missing
Number of data items:	Two
Units of measurement:	g dl^{-1}
Options:	First recorded at hospital haemoglobin missing – **Y**es or **N**o

Definition for collection:

- specifies the first haemoglobin value from blood sampled within 12 hours of attendance at the first hospital for this TBI
- the haemoglobin value must be documented
- the first haemoglobin value may not be measured and recorded at the first hospital and, if transferred, may be measured and recorded at a subsequent hospital within 12 hours of attendance at first hospital for this TBI
- laboratory results only - laboratory results are defined as results of tests performed either in the departments of Clinical Chemistry or Haematology or in near-patient testing/point-of-care testing laboratories with formal quality control programmes in operation
- if no blood was sampled for haemoglobin measurement within 12 hours of being at or in the first hospital, then record haemoglobin values as missing

Justification

Required for risk prediction models

First recorded at hospital heart rate

Field:	First recorded at hospital heart rate
Number of data items:	One
Units of measurement:	beats min^{-1}

Definition for collection:

- specifies the first heart (ventricular) rate measured and recorded within 12 hours of attendance at the first hospital for this TBI
- the first heart (ventricular) rate may not be measured and recorded at the first hospital and, if transferred, may be measured and recorded at, or en route to (i.e. on the transfer form), a subsequent hospital within 12 hours of attendance at first hospital for this TBI
- where no heart rate was detectable or measurable, then the value zero should be recorded

Justification

Required for risk prediction models

First recorded at hospital oxygen saturation

Fields:	First recorded at hospital oxygen saturation
Number of data items:	One
Units of measurement:	%

Definition for collection:

- specifies the first oxygen saturation measured and recorded within 12 hours of attendance at the first hospital for this TBI
- the first oxygen saturation may not be measured and recorded at the first hospital and, if transferred, may be measured and recorded at, or en route to (i.e. on the transfer form), a subsequent hospital within 12 hours of attendance at first hospital for this TBI
- oxygen saturation is normally recorded with pulse oximeter

Justification

Required for risk prediction models

First recorded at hospital platelet count

Fields:	First recorded at hospital platelet count or First recorded at hospital platelet count missing
Number of data items:	Two
Units of measurement:	$x10^9\ l^{-1}$
Options:	First recorded at hospital platelet count missing – **Y**es or **N**o

Definition for collection:

- specifies the first platelet count from blood sampled within 12 hours of attendance at the first hospital for this TBI
- the platelet count must be documented
- the first platelet count may not be measured and recorded at the first hospital and, if transferred, may be measured and recorded at a subsequent hospital within 12 hours of attendance at first hospital for this TBI
- laboratory results only - laboratory results are defined as results of tests performed either in the departments of Clinical Chemistry or Haematology or in the near-patient testing/point of care testing laboratories with formal quality control programmes in operation
- if no blood was sampled for platelet count measurement within 12 hours of being at or in the first hospital, then record platelet count as missing

Justification

Required for risk prediction models

First recorded at hospital prothrombin time (PT) (ratio)

Fields:	First recorded at hospital PT (ratio) or First recorded at hospital PT missing
Number of data items:	Two
Units of measurement:	Ratio
Options:	First recorded at hospital PT missing – **Y**es or **N**o

Definition for collection:

- specifies the first PT from blood sampled within 12 hours of attendance at the first hospital for this TBI
- the PT must be documented
- the first PT may not be measured and recorded at the first hospital and, if transferred, may be measured and recorded at a subsequent hospital within 12 hours of attendance at first hospital for this TBI
- laboratory results only - laboratory results are defined as results of tests performed either in the departments of Clinical Chemistry or Haematology or in the near-patient testing/point of care testing laboratories with formal quality control programmes in operation
- record first PT as a ratio
- the INR (International Normalised Ratio) may be entered for the PT ratio
- if no blood was sampled for PT measurement within 12 hours of being at or in the first hospital, then record PT as missing

Justification

Required for risk prediction models

First recorded at hospital prothrombin time (PT) (seconds)

Fields:	First recorded at hospital PT (seconds) First recorded at hospital PT control time (seconds) or First recorded at hospital PT missing
Number of data items:	Three
Units of measurement:	Seconds
Options:	First recorded at hospital PT missing – **Y**es or **N**o

Definition for collection:

- specifies the first PT from blood sampled within 12 hours of attendance at the first hospital for this TBI
- the PT must be documented
- the first PT may not be measured and recorded at the first hospital and, if transferred, may be measured and recorded at a subsequent hospital within 12 hours of attendance at first hospital for this TBI
- laboratory results only - laboratory results are defined as results of tests performed either in the departments of Clinical Chemistry or Haematology or in the near-patient testing/point of care testing laboratories with formal quality control programmes in operation
- record first PT in seconds and the control time in seconds
- if no blood was sampled for PT measurement within 12 hours of being at or in the first hospital, then record PT as missing

Justification

Required for risk prediction models

First recorded at hospital pupil reactivity and size of pupils

Field:	First recorded at hospital pupil reactivity and/or size recorded? First recorded at hospital pupil reactivity (left eye) First recorded at hospital size of pupils (left eye) First recorded at hospital pupil reactivity (right eye) First recorded at hospital size of pupils (right eye)
Number of data items:	Five
Units of measurements:	mm
Options:	First recorded at hospital pupil reactivity and/or size recorded? – **Y**es – both, yes – **R**eactivity, yes – **S**ize or **N**o First recorded at hospital pupil reactivity – **R**eactive, **U**nreactive or u**N**able to assess First recorded at hospital size of pupils – **1** mm, **2** mm, **3** mm, **4** mm, **5** mm, **6** mm or greater than or equal to **7** mm

Definition for collection:

- specifies the first pupil reactivity and size of pupils assessed and recorded, for both eyes, within 12 hours of attendance at the first hospital for this TBI
- the first pupil reactivity and size of pupils may not be assessed and recorded at the first hospital and, if transferred, may be assessed and recorded at, or en route to (i.e. on the transfer form), a subsequent hospital within 12 hours of attendance at first hospital for this TBI
- if pupil reactivity and size were assessed and recorded within 12 hours of attendance at the first hospital for this TBI then indicate **Y**es - both, if neither recorded then indicate **N**o, if reactivity was assessed but not size then record yes – **R**eactivity, if size was measured but not reactivity then record yes - **S**ize
- **R**eactive is defined as pupillary contraction to strong direct light, **U**nreactive is defined as no pupillary contraction to strong direct light
- u**N**able to assess is where pupils cannot be inspected (e.g. eyes are closed due to facial injury or swelling, etc)
- pupils are recorded regardless of whether admission is ventilated or sedated
- chronically altered pupils from previous disease should be recorded as unable to assess
- only assess pupil reactivity and size when an admission is free from iatrogenic drug effects (e.g. drops given for dilation)
- size of pupils is the diameter of the right and left pupil in mm; if pupils are equal to or more than 7 mm then record as greater than or equal to **7** mm

Justification

Required for risk prediction models

First recorded at hospital serum glucose

Fields:	First recorded at hospital serum glucose or First recorded at hospital serum glucose missing
Number of data items:	Two
Units of measurement:	mmol l^{-1}
Options:	First recorded at hospital serum glucose missing – **Y**es or **N**o

Definition for collection:

- specifies the first serum glucose value from blood sampled within 12 hours of attendance at the first hospital for this TBI
- the serum glucose value must be documented
- the first serum glucose value may not be measured and recorded at the first hospital and, if transferred, may be measured and recorded at a subsequent hospital within 12 hours of attendance at first hospital for this TBI
- laboratory results only - laboratory results are defined as results of tests performed either in the departments of Clinical Chemistry or Haematology or in the near-patient testing/point of care testing laboratories with formal quality control programmes in operation
- serum glucose values can be taken from the blood gas analyser
- if no blood was sampled for serum glucose measurement within 12 hours of being at or in the first hospital, then record serum glucose as missing

Justification

Required for risk prediction models

First recorded at hospital temperature

Fields:	First recorded at hospital temperature First recorded at hospital temperature site
Number of data items:	Two
Units of measurement:	°C
Options:	First recorded at hospital temperature site – **C**entral or **N**on-central

Definition for collection:

- specifies the first temperature measured and recorded within 12 hours of attendance at the first hospital for this TBI
- the first temperature may not be measured and recorded at the first hospital and, if transferred, may be measured and recorded at, or en route to (i.e. on the transfer form), a subsequent hospital within 12 hours of attendance at first hospital for this TBI
- central are preferred to non-central temperatures, so if first temperature measured and recorded is non-central value, then use subsequent central if measured and recorded within one hour
- central sites include tympanic membrane, nasopharyngeal, oesophageal, rectal, pulmonary artery and bladder; all other sites are considered to be non-central
- temperature values are included irrespective of whether the value was artificially manipulated through treatment such as central cooling
- temperature values measured and recorded for the purpose of estimating perfusion e.g. toe or ear lobe, are not to be included
- first recorded at hospital temperature site specifies whether site at which temperature was taken is **C**entral or **N**on-central

Justification

Required for risk prediction models

Gastrointestinal support days

Field:	Gastrointestinal support days
Number of data items:	One
Units of measurement:	Calendar days

Definition for collection:

- specifies the number of calendar days during which the admission received any gastrointestinal support whilst on your unit
- a calendar day is defined as any complete calendar day (00:00-23:59) or part thereof, e.g. a patient admitted on 1 January 2006 at 23:45 and discharged on 3 January 2006 at 00:10 would be recorded as having received three calendar days of care
- record 1, 2, 3 etc for one, two, three etc calendar days; record 998 for 998 or more calendar days; record 999 for support occurring but number of days not known
- Gastrointestinal – indicated by the following:
    - admissions receiving parenteral or enteral nutrition (i.e. any method of feeding other than normal oral intake)

Justification

Required to describe organs supported

GP Practice name

Fields:	GP Practice name
Number of data items:	One

Definition for collection:

- specifies the name of the GP practice to which this admission to your unit is registered
- if the GP practice name is unobtainable, then leave field blank

Justification

Required for the six-month follow-up of admission with TBI

GP Practice postcode

Field:	GP Practice postcode
Number of data items:	One

Definition for collection:

- specifies the postcode of the GP practice to which this admission to your unit is registered
- if outcode (first half of postcode) is obtainable, then record this
- if postcode is unobtainable, then record UNKNOWN

Justification

Required for the six-month follow-up of admission with TBI

GP’s initial(s)

Field:	GP’s initial(s)
Number of data items:	One

Definition for collection:

- specifies the initial(s) of the GP to whom this admission to your unit is registered
- if the initial(s) of the GP are not available, then please leave the field blank

Justification

Required for the six-month follow-up of admission with TBI

GP’s surname

Field:	GP’s surname
Number of data items:	One

Definition for collection:

- specifies the surname (family name) of the GP to whom this admission to your unit is registered

Justification

Required for the six-month follow-up of admission with TBI

Has the patient been recruited into any other research study

Field:	Has the patient been recruited into any other research study?
Number of data items:	Four
Options:	RESCUEicp – **Y**es or **N**o Eurotherm3235 – **Y**es or **N**o STITCH – **Y**es or **N**o Other – **Y**es or **N**o

Definition for collection:

- specifies if the admission has been recruited into another research study or studies that involve(s) a six-month follow-up or multiple follow-ups
- if the admission has been recruited into a research study that involves a six-month follow-up or multiple follow-ups that has not been listed (e.g. Balti-2 etc.), then select Other and enter the name of the research study in the Additional information text box
- participation in another study does not prevent recruitment into RAIN, as RAIN is entirely observational and does not affect treatment

Justification

To ensure that follow up is streamlined so that patients are not contacted more often than is necessary

High/mixed density lesion greater than one millilitre present

Field:	High/mixed density lesion greater than one millilitre present
Number of data items:	One
Options:	**Y**es **N**o

Definition for collection:

- specifies if there is a high/mixed density lesion greater than one millilitre on the first CT scan following the TBI
- first CT scan is defined as the first CT scan performed after attendance at the first hospital for this TBI
- where there is more than one CT scan performed, the first CT scan must be used for data abstraction; if transferred, the first CT scan may be performed at a subsequent hospital
- **Y**es indicates there is a high/mixed density lesion of greater than one millilitre
- **N**o indicates there is no high/mixed density lesion of greater than one millilitre

Justification

Required for risk prediction models

Hospital number

Field:	Hospital number
Number of data items:	One

Definition for collection:

- unique number assigned by your hospital to each NHS hospital admission/patient

Justification

Provides a unique identifier that can be used to identify the patient on other hospital systems

Intoxication at time of TBI

Field:	Intoxication at time of TBI
Number of data items:	One
Options:	**Y**es **S**uspected **N**o

Definition for collection:

- specifies whether admission was intoxicated (e.g. with drugs, alcohol etc.) at the time of TBI
- **Y**es where evidence of intoxication recorded
- **S**uspected where evidence indicates the admission may have been intoxicated (e.g., found outside pub, smells of alcohol etc.)
- **N**o where no evidence of intoxication recorded

Justification

Required for description of TBI

Last pre-sedation Glasgow Coma Score (GCS)

Fields: Last pre-sedation total GCS
Associated eye component
Associated motor component
Associated verbal component
Location of last pre-sedation GCS

Number of data items: Five
Units of measurement: None
Options: Location – Accident & **E**mergency, **W**ard, **C**ritical care, **A**cute Assessment unit or **N**ot in hospital

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Definition for collection:

- specifies the last pre-sedation GCS assessed and recorded following admission to hospital or last GCS prior to or at admission to your unit, if never sedated
- all values assessed and recorded from the same assessment of the last pre-sedation total GCS following admission to hospital
- only GCS assessed when the admission is free from the effects of sedative and/or paralysing or neuromuscular blocking agents are valid
- the determination as to whether an admission is free from the effects of sedative and/or paralysing or neuromuscular blocking agents is left to clinical judgement, as this is the only realistic standardisation for collection of these data at this time
- admissions with self-sedation through deliberate or accidental overdose/poisoning should have a GCS assessed as seen
- the GCS may be either documented as a score (for example, as numbers) or as explicit text allowing precise assignment of the score (e.g. “fully alert and orientated” equals 15).
- see Appendix: How to assess the Glasgow Coma Score (GCS)
- location of last pre-sedation GCS specifies where the last pre-sedation GCS was recorded
- Accident & **E**mergency is the Accident and Emergency department
- **W**ard is any ward in the hospital
- **C**ritical care includes the intensive care unit, high dependency unit or equivalent step-up/down unit in the hospital and a recovery room used as a temporary critical care facility
- **A**cute assessment Unit includes a medical or surgical admissions/assessment unit, or clinical decision unit in the hospital

- **N**ot in hospital includes when the patient is being transferred (e.g. in an ambulance etc.)

- if the admission had the GCS recorded in specialist treatment area (e.g. endoscopy, catheter suites), imaging area (e.g. X-ray, CT, MRI or PET) or other transient locations, record the previous location from which the admission was sent from (A&E, Ward, Critical care or Acute assessment unit)

Justification

Required for risk prediction models

Lesion(s) present

Field:	Lesion(s) present
Number of data items:	One
Options:	**Y**es **N**o

Definition for collection:

- specifies if lesions(s) are present on the first CT scan following the TBI
- first CT scan is defined as the first CT scan performed after attendance at the first hospital for this TBI
- where there is more than one CT scan performed, the first CT scan must be used for data abstraction; if transferred, the first CT scan may be performed at a subsequent hospital
- a lesion is defined as a high density or mixed density abnormality which may be within or outside the brain; it includes abnormalities referred to as haematoma, intracerebral haemorrhage, contusion, or shearing injuries
- **Y**es indicates one or more lesions
- **N**o indicates no lesions

Justification

Acts as a filter field for CT findings

Level of care at discharge

[CMP: Level of care received at discharge from your unit]

Field:	Level of care at discharge
Number of data items:	One
Options:	Level **3** Level **2** Level **1** Level **0**

Definition for collection:

- level of care refers to the type of care received by the admission immediately prior to discharge from your unit
- location of an admission does not determine level of care
- Level 3 – indicated by one or more of the following:
  - admissions receiving advanced respiratory monitoring and support due to an acute illness
  - admissions receiving monitoring and support for two or more organ system dysfunctions (excluding gastrointestinal support) due to an acute illness
    - admissions solely receiving basic respiratory monitoring and support and basic cardiovascular monitoring and support due to an acute illness only meet Level 2
- Level 2 – indicated by one or more of the following:
  - admissions receiving monitoring and support for one organ system dysfunction (excluding gastrointestinal support) due to an acute illness
    - admissions solely receiving advanced respiratory monitoring and support due to an acute illness meet Level 3
    - admissions solely receiving basic respiratory and basic cardiovascular monitoring and support due to an acute illness meet Level 2
  - admissions receiving pre-surgical optimisation including invasive monitoring and treatment to improve organ system function
  - admissions receiving extended post-surgical care either because of the procedure and/or the condition of the admission
  - admissions stepping down to Level 2 from Level 3 care
- Level 1 – indicated by one or more of the following:
  - admission recently discharged from a higher level of care
  - admissions receiving a greater degree of observation, monitoring, intervention(s), clinical input or advice than Level 0 care

- admissions receiving critical care outreach service support fulfilling the medium-score group, or higher, as defined by NICE Guidelines 50

- Level 0 – indicated by the following:
  - admissions in hospital and receiving normal ward care

Justification

Required to describe admission with TBI

Levels of care

Fields:	Level 3 days Level 2 days Level 1 days Level 0 days
Number of data items:	Four
Units of measurement:	Calendar days

Definition for collection:

- a calendar day is defined as any complete calendar day (00:00-23:59) or part thereof e.g. a patient admitted on 1 January 2006 at 23:45 and discharged on 3 January 2006 at 00:10 would be recorded as having received three calendar days of care
- specifies the total number of calendar days during which the admission received care at a specific level of care whilst on your unit
- record 1, 2, 3 etc for one, two, three etc calendar days; record 998 for 998 or more calendar days; record 999 for support occurring but number of days not known
- the highest level of care within a calendar day is recorded such that if an admission changes from level 2 care to level 3 care, or vice versa, during a calendar day, then the level of care recorded is level 3 e.g. a complete calendar day on which an admission receives 30 minutes of level 3 care and 23 hours, 30 minutes of level 2 care is recorded as one calendar day of level 3 care
- location of an admission does not determine level of care
- Level 3 – indicated by one or more of the following:
    - admissions receiving advanced respiratory monitoring and support due to an acute illness
    - admissions receiving monitoring and support for two or more organ system dysfunctions (excluding gastrointestinal support) due to an acute illness
        - admissions solely receiving basic respiratory monitoring and support and basic cardiovascular monitoring and support due to an acute illness only meet Level 2
- Level 2 – indicated by one or more of the following:
    - admissions receiving monitoring and support for one organ system dysfunction (excluding gastrointestinal support) due to an acute illness
        - admissions solely receiving advanced respiratory monitoring and support due to an acute illness meet Level 3
        - admissions solely receiving basic respiratory and basic cardiovascular monitoring and support due to an acute illness meet Level 2

- admissions receiving pre-surgical optimisation including invasive monitoring and treatment to improve organ system function
- admissions receiving extended post-surgical care either because of the procedure and/or the condition of the admission
- admissions stepping down to Level 2 from Level 3 care

- Level 1 – indicated by one or more of the following:
  - admission recently discharged from a higher level of care
  - admissions receiving a greater degree of observation, monitoring, intervention(s), clinical input or advice than Level 0 care
  - admissions receiving critical care outreach service support fulfilling the medium-score group, or higher, as defined by NICE Guidelines 50
- Level 0 – indicated by the following:
  - admissions in hospital and receiving normal ward care

Justification

Required to describe admission with TBI

Liver support days

Field:	Liver support days
Number of data items:	One
Units of measurement:	Calendar days

Definition for collection:

- specifies the number of calendar days during which the admission received liver support whilst on your unit
- a calendar day is defined as any complete calendar day (00:00-23:59) or part thereof e.g. a patient admitted on 1 January 2006 at 23:45 and discharged on 3 January 2006 at 00:10 would be recorded as having received three calendar days of care
- record 1, 2, 3 etc for one, two, three etc calendar days; record 998 for 998 or more calendar days; record 999 for support occurring but number of days not known
- Liver – indicated by the following:
    - admissions receiving management of coagulopathy (including liver purification and detoxification techniques) for acute on chronic hepatocellular failure, for portal hypertension, or for primary acute hepatocellular failure admissions being considered for transplantation

Justification

Required to describe organs supported

Major extracranial injury

Field:	Major extracranial injury
Number of data items:	One
Options:	**P**resent **A**bsent

Definition for collection:

- specifies whether major extracranial injury or injuries exist
- major injury is defined as an injury that would require hospital admission in its own right
- extracranial injury is defined as injury to any part of the body (excludes skull, but includes face, limbs, torso etc.)
- major extracranial injures may have been diagnosed pre-hospital or within 12 hours of attendance at first hospital for this TBI admission
- **P**resent when major extracranial injury or injuries are recorded
- **A**bsent when major extracranial injury or injuries are not recorded

Justification

Required for risk prediction models

Midline shift present

Field:	Midline shift present
Number of data items:	One
Options:	**Y**es – greater than five millimetres **N**o – less than or equal to five millimetres

Definition for collection:

- specifies if a midline shift of the brain is present on the first CT scan following the TBI
- first CT scan is defined as the first CT scan performed after attendance at the first hospital for this TBI
- where there is more than one CT scan performed, the first CT scan must be used for data abstraction; if transferred, the first CT scan may be performed at a subsequent hospital
- **Y**es indicates a midline shift of greater than five millimetres is present i.e. when the degree of displacement of the midline is more than 5 millimetres
- **N**o indicates a midline shift of less than or equal to five millimetres is present i.e. when the degree of displacement of midline is from 0-5 millimetres
- see Appendix: How to measure the midline shift

Justification

Required for risk prediction models

Neurological support days

Field:	Neurological support days
Number of data items:	One
Units of measurement:	Calendar days

Definition for collection:

- specifies the number of calendar days during which the admission received any neurological support whilst on your unit
- a calendar day is defined as any complete calendar day (00:00-23:59) or part thereof e.g. a patient admitted on 1 January 2006 at 23:45 and discharged on 3 January 2006 at 00:10 would be recorded as having received three calendar days of care
- record 1, 2, 3 etc. for one, two, three etc. calendar days; record 998 for 998 or more calendar days; record 999 for support occurring but number of days not known
- Neurological – indicated by one or more of the following:
    - admissions with central nervous system depression sufficient to prejudice their airway and protective reflexes, except central nervous system depression caused by sedation prescribed to facilitate mechanical ventilation; or, except poisoning (e.g. deliberate or accidental self-administered overdose, alcohol, drugs etc.)
    - admissions receiving invasive neurological monitoring or treatment (e.g. ICP (intracranial pressure), jugular bulb sampling, external ventricular drain etc.)
    - admissions receiving continuous intravenous medication to control seizures and/or for continuous cerebral monitoring
    - admissions receiving therapeutic hypothermia using cooling protocols or devices

Justification

Required to describe organs supported

NHS number (or CHI number)

Field:	NHS number (or CHI number)
Number of data items:	One

Definition for collection:

- unique number assigned by the NHS as a numeric ten digit code to each NHS patient
- use the Community Health Index (CHI) number in Scotland

Justification

Required to record the patient journey across hospitals allowing us to investigate transfers

One or more small petechial haemorrhages less than or equal to one millilitre present

Field:	One or more small petechial haemorrhages less than or equal to one millilitre present
Number of data items:	One
Options:	**Y**es **N**o

Definition for collection:

- specifies if there are one or more small petechial haemorrhages less than or equal to one millilitre present on the first CT scan following the TBI
- first CT scan is defined as the first CT scan performed after attendance at the first hospital for this TBI
- where there is more than one CT scan performed, the first CT scan must be used for data abstraction; if transferred, the first CT scan may be performed at a subsequent hospital
- small petechial haemorrhages includes small petechial haemorrhages at gray-white matter junction, hemispheric white matter, corpus callosum or brainstem
- **Y**es indicates there are one or more small petechial haemorrhages less than or equal to one millilitre present
- **N**o indicates there are no small petechial haemorrhages present

Justification

Required for risk prediction models

Patient's full name

Fields: Patient's first name
Patient's surname

Number of data items: Two

Definition for collection:

- specifies the first name and surname (family name) of this admission to your unit

Justification

Required for the six-month follow-up of admission with TBI

Patient’s house number or name

Fields:	Patient’s house number or name
Number of data items:	One

Definition for collection:

- specifies the normal residential house number/name for this admission to your unit
- for visitors to area, use normal residential address for admission’s permanent place of residence
- if address is unobtainable, then leave field blank

Justification

Required for the six-month follow-up of admission with TBI

Patient's postcode

Field:	Patient's postcode
Number of data items:	One

Definition for collection:

- specifies the normal residential postcode for this admission to your unit
- for visitors to area, use normal residential postcode for admission's permanent place of residence in United Kingdom
- if admission is not a resident of the United Kingdom and Ireland, then use the drop-down list of countries
- if outcode (first half of postcode) is obtainable, then record this
- if postcode is unobtainable, then record UNKNOWN

Justification

Required for the six-month follow-up of admission with TBI

Patient’s title

Field:	Patient’s title
Number of data items:	One

Definition for collection:

- specifies the title (Mr, Mrs, Ms etc) of this admission to your unit

Justification

Required for the six-month follow-up of admission with TBI

Pre-hospital AVPU

Fields:	Pre-hospital AVPU recorded? Pre-hospital AVPU
Number of data items:	Two
Options:	Pre-hospital AVPU recorded? – **Y**es or **N**o Pre-hospital AVPU – **A**lert, **V**oice, **P**ain or **U**nresponsive

Definition for collection:

- specifies the last AVPU assessed and recorded prior to attendance at first hospital for this TBI
- if AVPU assessed and recorded prior to attendance at first hospital for this TBI, then indicate **Y**es, if not, then indicate **N**o
- **A**lert indicates that the admission was fully awake (although may be confused or disorientated etc.), spontaneously opened eyes, responded to voice and had bodily motor function
- **V**oice indicates that the admission made a response when spoken to, this may be a verbal response (speech, a groan etc.) or movement of a limb
- **P**ain indicates that the admission made a response to a painful stimulus (e.g. limb withdrawal from the painful stimulus etc.)
- **U**nresponsive indicates that the admission did not give any eye, voice or motor response when spoken to or to a painful stimulus, i.e. unconscious

Justification

Required for risk prediction models

Pre-hospital blood pressure

Fields: Pre-hospital blood pressure recorded?
Pre-hospital systolic blood pressure
Pre-hospital paired diastolic blood pressure
Pre-hospital hypotension strongly suspected?

Number of data items: Four
Units of measurement: mmHg
Options: Pre-hospital blood pressure recorded? – **Y**es or **N**o
Hypotension strongly suspected? – **Y**es or **N**o

Definition for collection:

- specifies the first blood pressure measured and recorded and whether the admission was hypotensive prior to attendance at the first hospital for this TBI
- if pre-hospital blood pressure was measured and recorded prior to attendance at the first hospital for this TBI, then indicate **Y**es, if not, then indicate **N**o
- if pre-hospital blood pressure values recorded, then record first systolic blood pressure measured and recorded (i.e. prior to attendance at the first hospital for this TBI) plus paired diastolic blood pressure (i.e. values from same measurement)
- blood pressure values are included irrespective of the measurement method used
- where blood pressure values are not detectable or measurable, the value zero should be recorded
- if only the systolic blood pressure value was measured and recorded (i.e. paired diastolic is missing), then enter this value
- if pre-hospital hypotension strongly suspected, then indicate **Y**es, if not, then indicate **N**o
- hypotension strongly suspected specifies that admission had poor peripheral perfusion, a major haemorrhage (or other injuries likely to have caused a major bleed, such as a serious fracture to the pelvis or major long bones), increased lactate levels, admission appeared to be in shock, or if admission was recorded as "blood pressure low" etc but actual numbers were not recorded

Justification

Required for risk prediction models

Pre-hospital Glasgow Coma Score (GCS)

Fields:
- Pre-hospital GCS recorded?
- Pre-hospital total GCS
  - Associated eye component
  - Associated motor component
  - Associated verbal component
- Was this the last pre-sedation GCS?

Number of data items: Six
Units of measurement: None
Options:
- Pre-hospital GCS recorded? – **Y**es or **N**o
- Was this the last pre-sedation GCS? – **Y**es or **N**o

Definition for collection:

- specifies the last pre-sedation GCS assessed and recorded prior to attendance at first hospital for this TBI
- if GCS assessed and recorded prior to attendance at first hospital for this TBI, then indicate **Y**es, if not, then indicate **N**o
- all values assessed and recorded from the same assessment of the last total GCS prior to attendance at first hospital
- only GCS assessed when the admission is free from the effects of sedative and/or paralysing or neuromuscular blocking agents are valid
- the determination as to whether an admission is free from the effects of sedative and/or paralysing or neuromuscular blocking agents is left to clinical judgement, as this is the only realistic standardisation for collection of these data at this time
- admissions with self-sedation through deliberate or accidental overdose/poisoning should have a GCS assessed as seen
- the GCS may be either documented as a score (for example, as numbers) or as explicit text allowing precise assignment of the score (e.g. “fully alert and orientated” equals 15)
- if only the total GCS prior to admission to first hospital was recorded (i.e. the associated components are missing), then enter this value
- see Appendix: How to assess the Glasgow Coma Score (GCS)
- indicate whether this was the most recent or last pre-sedation GCS recorded (i.e. is there another pre-sedation GCS recorded since this value?)

Justification

Required for risk prediction models

Pre-hospital oxygen saturation

Fields:	Pre-hospital oxygen saturation recorded? Pre-hospital oxygen saturation Pre-hospital hypoxia strongly suspected?
Number of data items:	Three
Units of measurement:	%
Options:	Pre-hospital oxygen saturation recorded? – **Y**es or **N**o Pre-hospital hypoxia strongly suspected? – **Y**es or **N**o

Definition for collection:

- specifies the first oxygen saturation measured and recorded and whether the admission was hypoxic prior to attendance at the first hospital for this TBI
- if pre-hospital oxygen saturation measured and recorded prior to attendance at the first hospital for this TBI, then indicate **Y**es, if not then indicate **N**o
- if pre-hospital oxygen saturation measured and recorded, then record the first oxygen saturation measured and recorded (i.e. prior to attendance at the first hospital for this TBI)
- oxygen saturation is normally recorded with pulse oximeter
- if pre-hospital hypoxia strongly suspected, then indicate **Y**es, if not, then indicate **N**o
- pre-hospital hypoxia strongly suspected specifies that admission was recorded as, for example, cyanosed, had a blocked airway, had aspirated gastrointestinal contents, had clinical evidence of tension pneumothorax etc.

Justification

Required for risk prediction models

Pre-hospital pupil reactivity and size of pupils

Field:	Pre-hospital pupil reactivity and/or size recorded? Pre-hospital pupil reactivity (left eye) Pre-hospital size of pupils (left eye) Pre-hospital pupil reactivity (right eye) Pre-hospital size of pupils (right eye)
Number of data items:	Five
Units of measurement:	mm
Options:	Pre-hospital pupil reactivity and/or size recorded? – **Y**es – both, yes – **R**eactivity, yes – **S**ize or **N**o Pre-hospital pupil reactivity – **R**eactive, **U**nreactive or u**N**able to assess Pre-hospital size of pupils – **1** mm, **2** mm, **3** mm, **4** mm, **5** mm, **6** mm or greater than or equal to **7** mm

Definition for collection:

- specifies first pupil reactivity and size of pupils assessed and recorded, for both eyes, prior to attendance at the first hospital for this TBI
- if pupil reactivity and size were assessed and recorded prior to attendance at the first hospital for this TBI then indicate **Y**es - both, if neither recorded then indicate **N**o, if reactivity was assessed but not size then record yes – **R**eactivity, if size was measured but not reactivity then record yes - **S**ize
- **R**eactive is defined as pupillary contraction to strong direct light, **U**nreactive is defined as no pupillary contraction to strong direct light
- u**N**able to assess is defined where pupils cannot be inspected (e.g. eyes are closed due to facial injury or swelling, etc)
- pupils are recorded regardless of whether admission is ventilated or sedated
- chronically altered pupils from previous disease should be recorded as unable to assess
- only assess pupil reactivity and size when an admission is free from iatrogenic drug effects (e.g. drops given for dilation)
- size of pupils is the diameter of the right and left pupil in mm; if pupils are equal to or more than 7 mm then record as greater than or equal to **7** mm

Justification

Required for risk prediction models

Previous RAIN Study Admission number

Field:	Previous RAIN Study Admission number
Number of data items:	One
Units of measurement:	None

Definition for collection:

- specifies the previous RAIN Study Admission number for this admission
- if the admission was previously admitted to your unit and entered on the RAIN secure, web-based data entry system, then enter the RAIN Study Admission number for this admission
- admission to your unit is defined as the physical admission and the recording of that admission to a bed in your unit

Justification

Acts as a filter field for all RAIN Study screens

Prior source

[CMP: Prior location (in)]

Field:	Prior source
Number of data items:	One
Options:	**W**ard o**B**stetrics area other inter**M**ediate care area **P**aediatric ICU/HDU level 3 bed in adult **I**CU or ICU/HDU level 2 bed in adult ICU or ICU/**H**DU adult HD**U** **N**ot in hospital

Definition for collection:

- specifies the non-transient prior source for admissions where the Direct source is transient (i.e. theatre & recovery, accident & emergency, recovery only, imaging department, specialist treatment area, clinic)
- **W**ard is a ward in the hospital
- o**B**stetrics area is a delivery suite, labour ward or obstetrics ward in the hospital
- other inter**M**ediate care area is a CCU or other area in the hospital where the level of care is greater than the normal ward but is not an ICU or combined ICU/HDU or HDU (use text box to specify where)
- **P**aediatric ICU/HDU is a paediatric ICU or combined ICU/HDU or HDU in the hospital
- level 3 bed in adult **I**CU or ICU/HDU is a level 3 bed in either an adult ICU or a combined ICU/HDU in the hospital
- level 2 bed in adult ICU or ICU/**H**DU is a level 2 bed in either an adult ICU or a combined ICU/HDU in the hospital
- adult HD**U** is an adult HDU or equivalent step-up/step-down unit in the hospital, where the Critical Care Minimum Data Set (CCMDS) is collected
- **N**ot in hospital is defined as not in hospital

Justification

Required to describe admission with TBI

Prior source location

[CMP: Hospital housing non-transient location (in)]

Field:	Prior source location
Number of data items:	One
Options:	**S**ame hospital other **A**cute hospital n**O**n-acute hospital

Definition for collection:

- specifies the hospital housing the non-transient (Ward, Obstetrics area, Level 3 bed in adult ICU or ICU/HDU, Adult HDU etc) prior source for admission where the Direct source is transient
- **S**ame hospital is defined as the hospital that houses your unit
- other **A**cute hospital, one that does not house your unit, is defined as another hospital (can be in the same or a different NHS Trust) that provides a range of acute hospital services to diagnose, treat and care for seriously ill or injured patients; some acute hospitals may provide only specialist services while others will provide general services
- n**O**n-acute hospital is defined as another hospital (can be in the same or a different NHS Trust) that provides a range of short or long-term non-acute services

Justification

Required to describe admission with TBI

Pupil reactivity and size of pupils on admission to your unit

Field:	Pupil reactivity and/or size on admission to your unit recorded? Admission pupil reactivity (left eye) Admission size of pupils (left eye) Admission pupil reactivity (right eye) Admission size of pupils (right eye)
Number of data items:	Five
Units of measurements:	mm
Options:	Pupil reactivity and/or size on admission to your unit recorded? – **Y**es – both, yes – **R**eactivity, yes – **S**ize or **N**o Pupil reactivity on admission to your unit – **R**eactive, **U**nreactive or u**N**able to assess Admission size of pupils – **1** mm, **2** mm, **3** mm, **4** mm, **5** mm, **6** mm or greater than or equal to **7** mm

Definition for collection:

- specifies pupil reactivity and size of pupils assessed and recorded, for both eyes, following admission to your unit
- if pupil reactivity and size were measured and assessed following admission to your unit then indicate **Y**es - both, if neither recorded then indicate **N**o, if reactivity was assessed but not size then record yes – **R**eactivity, if size was measured but not reactivity then record yes - **S**ize
- **R**eactive is defined as pupillary contraction to strong direct light, **U**nreactive is defined as no pupillary contraction to strong direct light
- u**N**able to assess is defined where pupils cannot be inspected (e.g. eyes are closed due to facial injury or swelling, etc)
- pupil reactivity and size of pupils must be measured and recorded within one hour of admission to your unit
- if pupil reactivity and size is measured and recorded more than once within one hour of admission to your unit, then enter the values closest to the time of admission
- pupils are recorded regardless of whether admission is ventilated or sedated
- chronically altered pupils from previous disease should be recorded as unable to assess
- only assess pupil reactivity and size when an admission is free from iatrogenic drug effects (e.g. drops given for dilation)
- size of pupils is the diameter of the right and left pupil in mm; if pupils are equal to or more than 7 mm then record as greater than or equal to **7** mm

Justification

Required for risk prediction models

RAIN Study Admission number

Field:	RAIN Study Admission number
Number of data items:	One
Units of measurement:	None

Definition for collection:

- unique number assigned to each admission to your unit with TBI
- value will be automatically generated by secure, web-based data entry system as each admission record is created
- admission to your unit is defined as the physical admission and the recording of that admission to a bed in your unit

Justification

Provides a unique confidential identifier for each admission with TBI to each unit participating in the RAIN Study

RAIN Study Centre number

Field:	RAIN Study Centre number
Number of data items:	One

Definition for collection:

- unique unit identifier supplied by ICNARC to each unit participating in the RAIN Study
- value will be automatically generated by secure web-based data entry system

Justification

Provides a unique, confidential identifier for each unit participating in the RAIN Study

Registered GP Practice Code

Field:	Registered GP Practice Code
Number of data items:	One

Definition for collection:

- specifies the Registered GP Practice Code of the GP to whom this admission to your unit is registered
- this consists of a letter followed by five numerals
- if there is no Registered GP Practice Code leave the field blank

Justification

Required for the six-month follow-up of admission with TBI

Renal support days

Field:	Renal support days
Number of data items:	One
Units of measurement:	Calendar days

Definition for collection:

- specifies the number of calendar days during which the admission received renal support whilst on your unit
- a calendar day is defined as any complete calendar day (00:00-23:59) or part thereof e.g. a patient admitted on 1 January 2006 at 23:45 and discharged on 3 January 2006 at 00:10 would be recorded as having received three calendar days of care
- record 1, 2, 3 etc for one, two, three etc calendar days; record 998 for 998 or more calendar days; record 999 for support occurring but number of days not known
- Renal - indicated by the following:
  - admissions receiving acute renal replacement therapy (e.g. haemodialysis, haemofiltration etc.)
  - admissions receiving renal replacement therapy for chronic renal failure where other acute organ support is received
- last day of renal support is the date and time of completion of final renal replacement treatment

Justification

Required to describe organs supported

Residence post-discharge

[CMP: Residence post-discharge from acute hospital]

Field:	Residence post-discharge
Number of data items:	One
Options:	ho**M**e n**U**rsing home or equivalent health-related institution – **S**hort-term rehabilitation health-related institution – **L**ong-term rehabilitation other **H**ealth-related institution n**O**n-health-related institution **R**esidential place of work/education hos**P**ice or equivalent **N**o fixed address/abode or temporary abode

Definition for collection:

- specifies the admission's permanent/semi-permanent place of residence post-discharge from acute hospital
- ho**M**e includes owner occupied and rented property, sheltered housing, safe housing, warden-controlled housing, mobile homes, houseboats, bed and breakfast (if not on holiday and on a semi-permanent basis) etc.
- n**U**rsing home or equivalent is an establishment providing nursing or personal care services to the older or infirm or chronically-ill population
- health-related institution – **S**hort-term rehabilitation includes a short-term care facility where rehabilitation (active promotion of recovery) care is focused on restoring and optimizing the admission's functional independence and health for a defined period with a view to subsequent discharge to a permanent/semi-permanent place of residence
- health-related institution – **L**ong-term rehabilitation includes a long-term care facility where rehabilitation (active promotion of recovery) care is intertwined with maintenance (active prevention of deterioration) and other care (support for disabilities) focused on stabilising the admission's functional independence and health for an undefined period and with only the possibility of subsequent discharge to a permanent/semi-permanent place of residence
- other **H**ealth-related institution includes any other health-related institution (not short-term or long-term rehabilitation) from which there is no possibility of subsequent discharge to a permanent/ semi-permanent place of residence (e.g. institution for chronically sick etc.)
- n**O**n-health-related institution includes prison, correctional facility, children's home etc.
- **R**esidential place of work/education includes barracks, oil rig, lighthouse, monastery, trawler, embassy, cruise ship, boarding school, university etc.

- hos**P**ice or equivalent is an establishment providing medical care and support services to terminally-ill persons

- **N**o fixed address/abode or temporary abode includes homeless or in hostels, bed and breakfast (if not on holiday and on a temporary basis)

Justification

Required to describe admission with TBI

Residence prior to admission to acute hospital

Field:	Residence prior to admission to acute hospital
Number of data items:	One
Options:	ho**M**e n**U**rsing home or equivalent **H**ealth-related institution n**O**n-health-related institution **R**esidential place of work/education hos**P**ice or equivalent **N**o fixed address/abode or temporary abode

Definition for collection:

- specifies admission's permanent/semi-permanent place of residence prior to admission to acute hospital
- for transient locations e.g. on holiday, in the pub, on the tennis court, in a car park, in a hotel (medical tourist), outside etc. use admission's permanent/semi-permanent place of residence
- ho**M**e includes owner occupied and rented property, sheltered housing, safe housing, warden-controlled housing, mobile homes, houseboats, bed and breakfast (if not on holiday and on a semi-permanent basis) etc.
- n**U**rsing home or equivalent is an establishment providing nursing or personal care services to the older or infirm or chronically-ill population
- **H**ealth-related institution includes psychiatric hospital, hospital or institution for chronically sick etc.
- n**O**n-health-related institution includes prison, correctional facility, children's home etc.
- **R**esidential place of work/education includes barracks, oil rig, lighthouse, monastery, trawler, embassy, cruise ship, boarding school, university etc.
- hos**P**ice or equivalent is an establishment providing medical care and support services to terminally-ill persons
- **N**o fixed address/abode or temporary abode includes homeless or in hostels, bed and breakfast (if not on holiday and on a temporary basis)

Justification

Required to describe admission with TBI

Respiratory support days

Fields:	Basic respiratory support days Advanced respiratory support days
Number of data items:	Two
Units of measurement:	Calendar days

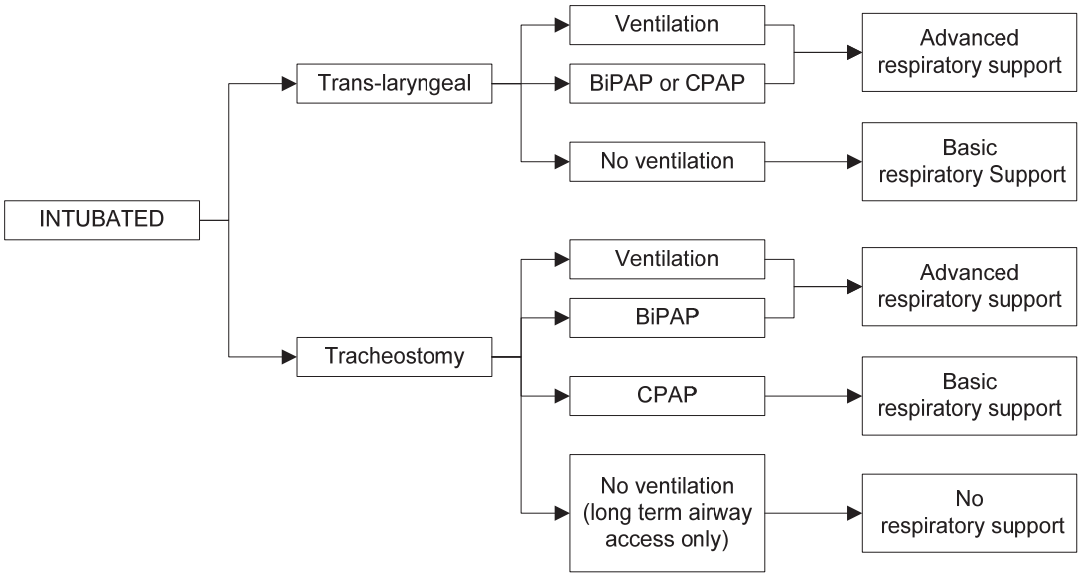
Definition for collection:

- specifies the number of calendar days during which the admission received any basic or advanced respiratory support whilst on your unit
- a calendar day is defined as any complete calendar day (00:00-23:59) or part thereof e.g. a patient admitted on 1 January 2006 at 23:45 and discharged on 3 January 2006 at 00:10 would be recorded as having received three calendar days of care
- record 1, 2, 3 etc for one, two, three etc calendar days; record 998 for 998 or more calendar days; record 999 for support occurring but number of days not known
- Advanced Respiratory - indicated by one or more of the following (see diagram):
  - admissions receiving invasive mechanical ventilatory support applied via a trans-laryngeal tube or applied via a tracheostomy
  - admissions receiving BiPAP (bilevel positive airway pressure) applied via a trans-laryngeal tracheal tube or applied via a tracheostomy
  - admissions receiving CPAP (continuous positive airway pressure) via a trans-laryngeal tracheal tube
  - admissions receiving extracorporeal respiratory support
  - admissions receiving mask/hood CPAP or mask/hood BiPAP is <u>not</u> considered advanced respiratory support
- Basic Respiratory - indicated by one or more of the following (see diagram):
  - admissions receiving more than 50% oxygen delivered by a face mask (except those receiving short-term increases in FiO_2, e.g. during transfer, for physiotherapy, etc.)
  - admissions receiving close observation due to the potential for acute deterioration to the point of requiring advanced respiratory monitoring and support e.g. severely compromised airway, deteriorating respiratory muscle function, etc.
  - admissions receiving physiotherapy or suction to clear secretions, at least two hourly, either via a tracheostomy, a minitracheostomy or in the absence of an artificial airway
  - admissions recently (i.e. within 24 hours) extubated after a period of intubation

- admissions recently (i.e. within 24 hours) extubated after a period (i.e. more than 24 hours) of mechanical ventilation via an endotracheal tube
- admissions receiving mask/hood CPAP or mask/hood BiPAP or non-invasive ventilation
- admissions receiving CPAP via a tracheostomy
- admissions intubated to protect their airway but receiving no ventilatory support and who are otherwise stable.

- Note: If advanced and basic respiratory monitoring and support occur simultaneously, then only advanced respiratory monitoring and support should be recorded.

- The following diagram may aid categorisation to advanced or basic respiratory support



Justification

Required to describe organs supported

Road traffic accident details

Field:	Road traffic accident details
Number of data items:	One
Options:	**V**ehicle occupant **M**otorcyclist **C**yclist **P**edestrian **O**ther

Definition for collection:

- specifies road traffic accident details
- **V**ehicle occupant includes driver or passenger in vehicle
- **M**otorcyclist includes driver or passenger on motorcycle or sidecar (e.g. motorised two-wheeled vehicle) etc.
- **C**yclist includes cyclist or passenger on pedal bike
- **P**edestrian includes someone on foot
- **O**ther is where road traffic accident details do not fit into above categories

Justification

Required to describe admission with TBI

Sex

Field:	Sex
Number of data items:	One
Options:	**F**emale **M**ale

Definition for collection:

- specifies the genotypical (i.e. sex they were born as) sex of the admission

Justification

Required to describe admission with TBI

Site(s) of major extracranial injury

Fields:	Spine Limb Head and neck Chest Pelvis Abdomen
Number of data items:	Six
Options:	**P**resent **A**bsent

Definition for collection:

- specifies site(s) of major extracranial injury or injuries
- major injury is defined as an injury that would require hospital admission in its own right
- extracranial injury is defined as injury to any part of the body (excludes skull, but includes face, limbs, torso etc)
- spine specifies injury to nerve tissue in spinal canal and/or damage to the spinal vertebrae
- limb specifies injury to arms (including hands) or legs (including feet)
- head and neck specifies extracranial injury to scalp, face or neck
- chest specifies injury to area between the neck and diaphragm (heart and lungs area)
- pelvis specifies injury to skeletal structure that joins spine and lower limbs
- abdomen specifies injury to lower torso (excluding pelvis)

Justification

Required for risk prediction models

Source location

[CMP: Hospital housing non-transient location (in) or Hospital housing transient location (in)]

Field:	Source location
Number of data items:	One
Options:	**S**ame hospital other **A**cute hospital n**O**n-acute hospital

Definition for collection:

- specifies the hospital housing the Direct source from which this admission was admitted to your unit
- **S**ame hospital is defined as the hospital that houses your unit
- other **A**cute hospital, one that does not house your unit, is defined as another hospital (can be in the same or a different NHS Trust) that provides a range of acute hospital services to diagnose, treat and care for seriously ill or injured patients; some acute hospitals may provide only specialist services while others will provide general services
- n**O**n-acute hospital is defined as another hospital (can be in the same or a different NHS Trust) that provides a range of short or long-term non-acute services

Justification

Required to describe admission with TBI

Spinal cord injury present

Fields:	Spinal cord injury present
Number of data items:	One
Options:	**Y**es **N**o

Definition for collection:

- specifies if there was a spinal cord injury consistent with major neurological deficit
- **Y**es indicates injury to the nerve tissue in spinal canal consistent with major neurological deficit
- **N**o indicates no injury to the nerve tissue in spinal canal or any injury that is not consistent with major neurological deficit

Justification

Required to describe admission with TBI

Status at discharge from your hospital

Field:	Status at discharge from your hospital
Number of data items:	One
Options:	**A**live **D**ead

Definition for collection:

- specifies the status of the admission at discharge from the hospital housing your unit

Justification

Required for risk prediction models

Status at discharge from your unit

Field:	Status at discharge from your unit
Number of data items:	One
Options:	**A**live **D**ead

Definition for collection:

- specifies the status of the admission at discharge from your unit
- **D**ead includes admissions who leave your unit to become heartbeating organ donors

Justification

Required for risk prediction models

Third ventricle

Field:	Third ventricle
Number of data items:	One
Options:	**O**bliterated **P**resent

Definition for collection:

- specifies the appearance of the third ventricle on the first CT scan following the TBI
- first CT scan is defined as the first CT scan performed after attendance at the first hospital for this TBI
- where there is more than one CT scan performed, the first CT scan must be used for data abstraction; if transferred, the first CT scan may be performed at a subsequent hospital
- **O**bliterated indicates the third ventricle is not present
- **P**resent indicates the third ventricle appears normal on the first CT scan

Justification

Required for risk prediction models

Traumatic subarachnoid haemorrhage present

Field:	Traumatic subarachnoid haemorrhage present
Number of data items:	One
Options:	**Y**es **N**o

Definition for collection:

- specifies if a traumatic subarachnoid haemorrhage was present on the first CT scan following the TBI
- first CT scan is defined as the first CT scan performed after attendance at the first hospital for this TBI
- where there is more than one CT scan performed, the first CT scan must be used for data abstraction; if transferred, the first CT scan may be performed at a subsequent hospital
- traumatic subarachnoid haemorrhage is defined as a collection of blood between the arachnoid and pia mater either over the convexity or in the basal cisterns
- **Y**es indicates there is a traumatic subarachnoid haemorrhage
- **N**o indicates no traumatic subarachnoid haemorrhage
- if there is uncertainty on whether subarachnoid haemorrhage is caused by the TBI, then record as **Y**es

Justification

Required for risk prediction model

Type of high/mixed density lesion(s) present

Field:	Extradural haematoma(s) present Subdural haematoma(s) present Intracerebral haematoma(s) haemorrhage(s) or contusion(s) present Posterior fossa haematoma(s) present Main mass lesion
Number of data items:	Five
Options:	Type of high/mixed density lesion(s) present – **Y**es or **N**o Main mass lesion – **E**xtradural, **S**ubdural, **I**ntracerebral or **P**osterior fossa haematoma

Definition for collection:

- specifies the type(s) of haematoma(s) present on the first CT scan following the TBI
- first CT scan is defined as the first CT scan performed after attendance at the first hospital for this TBI
- where there is more than one CT scan performed, the first CT scan must be used for data abstraction; if transferred, the first CT scan may be performed at a subsequent hospital
- extradural haematoma (or epidural haematoma or extradural haemorrhage) is defined as an accumulation of blood between the skull and dura mater
- subdural haematoma (or subdural haemorrhage) is defined as a collection of blood between the dura and the arachnoid mater
- intracerebral haematoma (or intracerebral haemorrhage or contusion) is defined as bleeding within the cerebral hemispheres
- posterior fossa haematoma is defined as a collection of blood in the intracranial cavity in posterior fossa
- main mass lesion indicates which is the main (largest volume) mass lesion

Justification

Required for risk prediction models

Type of TBI

Field:	Type of TBI
Number of data items:	One
Options:	**P**enetrating **N**on-penetrating

Definition for collection:

- specifies type of TBI
- **P**enetrating head injury is defined as when an object/projectile penetrates the skull; the skull may have a fracture, but if an object has not penetrated the skull it is classed as non-penetrating
- **N**on-penetrating head injury is when an object/projectile does not penetrate the skull and includes closed head injury; the skull may have a fracture, but if an object has not penetrated the skull it is classed as non-penetrating

Justification

Required for risk prediction models

Type of unit (in)
[CMP: Type of adult ICU/HDU (in)]

Field:	Type of unit (in)
Number of data items:	One
Options:	**G**eneral **C**ardiac **T**horacic **L**iver **S**pinal injury **B**urns & plastic **R**enal **N**eurosciences **M**edical s**U**rgical **O**bstetric

Definition for collection:

- specifies the type of adult ICU or combined ICU/HDU or HDU from which the admission was transferred prior to admission to your unit
- specifies the principal clinical service or predominant patient population
- for mixed units use either **G**eneral or the predominant specialty

Justification

Required to describe admission with TBI

Type of unit (out)
[CMP: Type of adult ICU/HDU (out)]

Field:	Type of unit (out)
Number of data items:	One
Options:	**G**eneral **C**ardiac **T**horacic **L**iver **S**pinal injury **B**urns & plastic **R**enal **N**eurosciences **M**edical s**U**rgical **O**bstetric

Definition for collection:

- specifies the type of adult ICU or combined ICU/HDU or HDU to which the admission was transferred post-discharge from your unit
- specifies the principal clinical service or predominant patient population
- for mixed units use either **G**eneral or the predominant specialty

Justification

Required to describe admission with TBI

Ultimate date of discharge

[CMP: Date of ultimate discharge from hospital]

Field:	Ultimate date of discharge
Number of data items:	One
Units of measurement:	Date dd/mm/yyyy

Definition for collection:

- specifies the latest documented date of the admission being physically within an acute in-patient bed in an acute hospital, or the date of death
- ultimate discharge from hospital is defined as the physical discharge and recording of that discharge from an acute in-patient bed in an acute hospital
- an acute hospital is defined as any hospital providing a range of acute hospital services to diagnose, treat and care for seriously ill or injured patients; some acute hospitals may provide only specialist services while others will provide general services
- where more than one date of discharge from hospital is documented, the latest documented date is recorded
- this is not necessarily the date of discharge from the acute hospital to which the admission was directly transferred

Justification

Required to describe admission with TBI

Ultimate status at discharge

[CMP: Status at ultimate discharge from hospital]

Field:	Ultimate status at discharge
Number of data items:	One
Options:	**A**live **D**ead

Definition for collection:

- specifies the status at ultimate discharge from acute hospital
- the hospital is another acute hospital, not the hospital housing your unit

Justification

Required for the risk prediction models

Ultimate status at discharge from critical care

[CMP: Status at ultimate discharge from ICU/HDU]

Field:	Ultimate status at discharge from critical care
Number of data items:	One
Options:	**A**live **D**ead

Definition for collection:

- specifies the status of the admission on ultimate discharge from adult critical care, the ultimate discharge is defined as the physical discharge and recording of that discharge from a bed in another critical care unit
- critical care unit is defined as an ICU or a combined ICU/HDU or an HDU

Justification

Required for risk prediction models

Unit in your critical care transfer group (in)

[CMP: Adult ICU/HDU within your critical care transfer group (in)]

Field:	Unit in your critical care transfer group (in)
Number of data items:	One
Options:	**Y**es **N**o

Definition for collection:

- specifies whether the critical care unit (adult ICU or combined ICU/HDU or HDU) is part of your critical care transfer group
- a critical care transfer group is defined as the group, recommended by “Comprehensive Critical Care” and supported by “Quality Critical Care”, specified and developed to reduce the number of long distance transfers that take place and to ensure that transfers are contained within the critical care network or, by special agreement, between hospitals at the borders of adjacent networks

Justification

Required to describe admission with TBI

Unit in your critical care transfer group (out)

[CMP: Adult ICU/HDU within your critical care transfer group (out)]

Field:	Unit within your critical care transfer group (out)
Number of data items:	One
Options:	**Y**es **N**o

Definition for collection:

- specifies whether the critical care unit (adult ICU or combined ICU/HDU or HDU) is part of your critical care transfer group
- a critical care transfer group is defined as the group, recommended by “Comprehensive Critical Care” and supported by “Quality Critical Care”, specified and developed to reduce the number of long distance transfers that take place and to ensure that transfers are contained within the critical care network or, by special agreement, between hospitals at the borders of adjacent networks

Justification

Required to describe admission with TBI

Volume of largest high/mixed density lesion

Field:	Volume of largest high/mixed density lesion
Number of data items:	One
Options:	**G**reater than 25 millilitres **L**ess than or equal to 25 millilitres

Definition for collection:

- specifies if the volume of the largest high/mixed density lesion, present on the first CT scan following the TBI, is greater than 25 millilitres
- first CT scan is defined as the first CT scan performed after attendance at the first hospital for this TBI
- where there is more than one CT scan performed, the first CT scan must be used for data abstraction; if transferred, the first CT scan may be performed at a subsequent hospital
- **G**reater than 25 millilitres specifies that the volume of the largest high/mixed density lesion is greater than 25 millilitres
- **L**ess than or equal to 25 millilitres specifies that the volume of the largest high/mixed density lesion is less than or equal to 25 millilitres
- volume of lesion is estimated by using the formula:
  Volume (ml) = (length x breadth x height) divided by 2

  All measurements are in cm, in relation to the scale displayed on each CT image. Any blood in contiguity with the lesion is considered part of it and included in the measurement

  - length is measured on the CT slice where the lesion is largest
  - breadth is the measurement of the lesion at right angles to the length, *measured on the same slice as the length*
  - height is calculated by multiplying the CT slice thickness by the number of CT slices on which the lesion is visible

Justification

Required for risk prediction models

Appendix: Table of FiO_2 approximations

Conversion table for FiO_2 when measured on nasal cannula or mask (see references overleaf):

Values given represent an estimation of the likely overall FiO_2 in the airway, not just the concentration in the mask, assuming a relatively normal respiratory pattern.

Nasal cannula		Face mask		Face mask with reservoir bag		"Venturi" type face mask e.g. Ventimask		Aerosol face mask O2 15 l min^{-1} via nebulizer	
l min^{-1}	FIO_2	l min^{-1}	FiO_2	l min^{-1}	FiO_2	Set %	FiO_2	Set %	FiO_2
1	0.22	2*	0.25	6	0.60	24	0.24	35	0.28
2	0.25	3*	0.27	7	0.70	28	0.28	40	0.30
3	0.27	4	0.30	8	0.80	35	0.35	70	0.50
4	0.30	5	0.35	9	0.85	40	0.40	100	0.60
5	0.35	6	0.40	10+	0.90	60	0.50		
		7	0.45						
		8+	0.50						

* we acknowledge that there is some fresh evidence that fresh gas flows less than 4 l min^{-1} are not recommended because of the risk of CO_2 retention.

References

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Appendix: How to assess the Glasgow Coma Score (GCS)

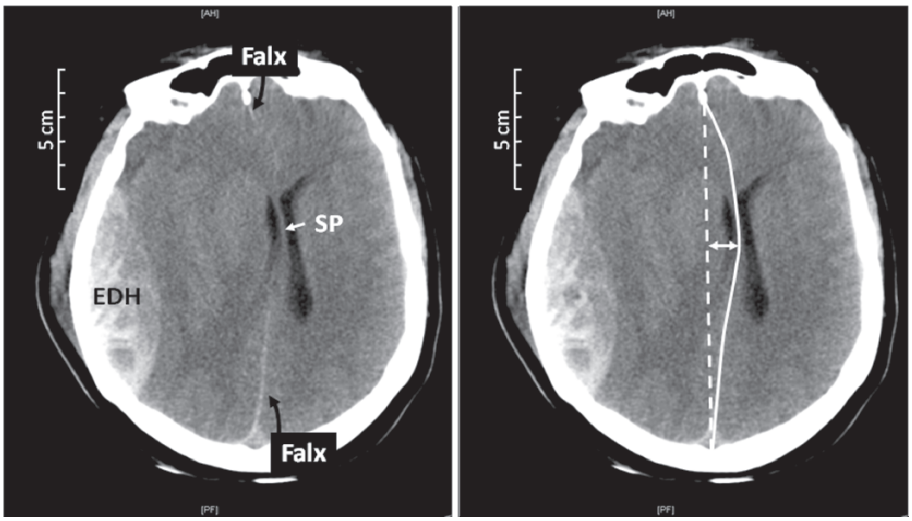
The GCS is assessed for adults[1] as follows:

The best eye opening response:	**GCS**
Spontaneous	**4**
To verbal command	**3**
To pain	**2**
No response	**1**
The best motor response:	
Obeys verbal command	**6**
Localises pain	**5**
Flexion withdrawal	**4**
Flexion-abnormal/decorticate rigidity	**3**
Extension/decerebrate rigidity	**2**
No response	**1**
The best verbal response:	
Oriented and converses	**5**
Disoriented and converses	**4**
Inappropriate words	**3**
Incomprehensible sounds (not words)	**2**
No response	**1**
If an admission is intubated, use clinical judgement to score verbal response as follows:	
Appears oriented and able to converse	**5**
Responsive but ability to converse questionable	**3**
Generally unresponsive	**1**

Reference

1 Knaus WA et al. Data Dictionary for Introduction to Data Collection, The APACHE II System: A severity of disease classification system

Appendix: How to measure the midline shift



Stage 1: Identifying anatomical landmarks (left image)

1. Choose a slice on which the septum pellucidim is clearly seen between the two lateral ventricles.
2. Identify the attachment of the falx cerebri to the front and back of the skull.
3. In some cases the falx will split at the back to encase the superior sagittal sinus (as in picture on left).
4. If the falx does split, the posterior midline is between the two leaves of the falx (as above).
5. Identify the septum pellucidum (between the lateral ventricles).

Stage 2: Drawing the midline (right image)

6. Draw a line between the point of attachment of the falx to the front and back of the skull.
7. This is the midline (the dashed line on the image on the right).
8. In some instances, the falx may not be seen clearly – if this is the case, draw the midline between the bony prominences that represent the points of attachment of the falx on the inside of the skull (the frontal crest and internal occipital crest).

Stage 3: Measuring midline shift (right image)

9. Check by eye on more than one CT slice and choose the one where midline shift is most pronounced.
10. Measure the lateral (horizontal) displacement of the septum pellucidum from the midline *at the point where such lateral displacement is maximal* (on the image on the right, the distorted midline is identified by the dotted line, which goes through the septum pellucidum).
11. Measurement on image archiving systems (e.g. PACS) can be done by drawing the midline using the scale/ruler tool, and then drawing a second line (as in the image above) to measure midline shift – the software will give you a measurement automatically.
12. Where the measurement is being done on CT film, calibrate the midline shift against the CT scale bar which will be there on every CT image (as above).
13. Report the midline shift in millimetre