

Data Completion Guide

Core variables

These variables provide essential information to enable reporting of case mix, acuity, and risk adjusted outcome. The patient identifiers are used to enable individual ICU stakeholders to track patients during the encounter. These are removed during data curation and an encounter ID is generated. Variables in **bold** are the parent variable, subsequent non bold variables provide greater granularity.

| Admission <i>P= Used to calculate SMR. Captured close to time admission, calculated using E TropicS or APACHE II.</i> <i>ID= used to identify encounters during the inpatient episode. Replaced with a unique platform encounter ID once encounter complete.</i> <i>S= Used for infection surveillance.</i> <i>*failure to save alert</i> <i>^ pre saving alert</i> | | |
|---|---|---|
| Variable name | Data entry format | guidance for collection of variables |
| Patient's name <i>ID</i> * | Text | The patient's surname and their given name. |
| Medical record number <i>ID</i> * | alphanumeric | A number given to a patient for a specific hospital encounter or repeated encounters. |
| Age <i>P</i> * | Years | Age of the patient on the day of admission to the ICU. |
| National identity number [^] | alphanumeric | A unique identifier for a patient that is given by the government |
| Fee paying [^] | Options: Yes, No | Indicate whether the patient is paying fees |
| Fee paying method [^] | Options: Private Insurance, Self/out of pocket, Government funded scheme, Employer funded/insurance, Other | <i>If 'Fee paying' is 'Yes':</i> Type of fee paying method |
| Other description [^] | Text | <i>If 'Fee paying method' is 'Other':</i> Description of the other fee paying method |
| Sex <i>P</i> * | Options: | The sex at birth |

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3 Ho, K.M., Dobb, G.J., Knuiman, M. et al. A comparison of admission and worst 24-hour Acute Physiology and Chronic Health Evaluation II scores in predicting hospital mortality: a retrospective cohort study. *Crit Care* 10, R4 (2005). <https://doi.org/10.1186/cc3913>

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| | Male, Female, Intersex | |
| Contact number ID^A | Numerical | The phone number of the patient that can be used for contact. |
| Date of hospital admission P^* | yyyy-mm-dd | The date of arrival of the patient in the hospital. |
| Time of hospital admission P^* | hh:mm:ss | The time of arrival of the patient in the hospital. |
| Date of ICU admission P^* | yyyy-mm-dd | The date of arrival of the patient in the ICU. Combined with the name of the patient and the medical record numbers this number enables unique encounters of care to be identified. |
| Time of ICU admission P^* | hh:mm:ss | The time of arrival of the patient in the ICU. |
| ICU admission source P^* | Dropdown list | The patient's clinical location immediately prior to this ICU admission. |
| Readmission to ICU during the current hospital encounter P | Options: Yes, No | The patient was discharged and readmitted to the ICU within the same hospital admission. |
| Date of previous discharge A | yyyy-mm-dd | <i>If 'Readmission to ICU during the current hospital encounter' is 'Yes':</i> Previous ICU discharge date during the patient's current hospital admission. |
| Type of admission P^* | Options: Non operative, Post operative | Non operative: All admissions not arriving directly from the operating theatre or recovery. This includes patients who may have undergone an operative procedure earlier in their hospital admission. Post operative: All patients who have been admitted to the ICU directly from the operation theatre or recovery. |
| Emergency surgery P^A | Options: Yes, No | <i>If 'Type of admission' is 'Post operative':</i> Emergency 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. |
| Reason for admission (operative) P^* | Type to search | <i>If 'Type of admission' is 'Post operative':</i> Search for the operative procedure from the SNOMED CT ¹ list which most accurately describes what procedure was undertaken. If there have been multiple operative procedures, use the additional fields to add additional procedures. |
| Reason for admission (disorder) P^A | Type to search | <i>If 'Type of admission' is 'post operative':</i> In addition to the operative procedure, search and select any disorders from the SNOMED CT list which necessitated admission to the ICU. |
| Reason for admission (disorder) P^* | Type to search | <i>If 'Type of admission' is 'Non operative':</i> |

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| | | The main disorder which has necessitated admission to the ICU. This should be based only on what is known or suspected to be primary disorder within the first hour of admission. Any additional disorders deemed to be significant to the patient's admission to the unit should be added using the additional reason for admission fields. |
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| SARI diagnosis S* | Options: Confirmed, Suspected, None | Indicate if the patient has a clinically suspected or laboratory confirmed Severe Acute Respiratory Infection. |
| Date of earliest symptom^ | yyyy-mm-dd | <i>If 'SARI diagnosis' is 'Confirmed' or 'Suspected':</i> The main disorder which has necessitated admission to the ICU. |
| Comorbidities P* | Dropdown list | Select conditions currently present and diagnosed prior to this hospital admission (CCI) |
| Comorbidities (Other)^ | Type to search | <i>If 'Comorbidities' is 'Other':</i> Search the SNOMED CT ¹ list and select any other conditions that are not available in the comorbidities dropdown list. |
| Admission Assessment | | |
| Variable name | Data entry format | Definition for collection |
| Ventilation P* | Dropdown list | Self vent: No breaths are delivered by a mechanical device during the first hour of admission to ICU. Mechanical vent: All or some of the breaths or a portion of the breaths (pressure support) are delivered by a mechanical device during the first hour of admission to ICU. |
| Route of ventilation* | Dropdown list | <i>If 'Ventilation' is 'Mechanical vent': options are</i> The type of mechanically assisted breathing during the first hour of admission. If multiple modes are used, please report the most invasive. ETT Tracheostomy NIV mask |
| Route of ventilation* | | <i>If 'Ventilation' is 'Self-vent': options are</i> Tracheostomy Own airway |
| Oxygen delivery device | | <i>If 'Ventilation' is 'Self-vent': options are</i> High-flow oxygen delivered via a specialised device, with FiO ₂ > 0.4 and at a flow rate of at least 30 L/min CPAP |

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| | | Simple face mask |
| FiO ₂ P* | / or % | The highest recorded inspired oxygen concentration during the first hour of admission to ICU. If not available in the first hour, then the highest value in the first 24 hrs should be recorded. |
| SpO ₂ P* | % | Percentage of oxygen-saturated haemoglobin during the first hour of admission to ICU. If not available in the first hour, the worst value in the first 24 hrs should be recorded. |
| PaO ₂ P^ | mmHg or kPa | The partial pressure of oxygen measured in the arterial blood. The lowest recorded during the first hour of admission. If not available in the first hour, the lowest value in the first 24 hrs should be recorded. |
| Arterial pH P^ | pH | The measurement of the pH of plasma of an arterial blood sample. The most deranged reading during the first hour of admission must be recorded. This is the reading furthest from the normal range of pH 7.35 to 7.45. If not available, the worst in the first 24hrs. |
| Sedated P* | Options: Yes, No | Use of sedative drugs for a minimum of one hour continuous infusion, or greater than one bolus. |
| Cardiovascular support P* | Options: Yes, No | Continuous intravenous vasoactive medication within the first hour of ICU admission. |
| Vasoactive therapy^ | Dropdown list | <i>If 'Cardiovascular support' is 'Yes':</i> The type and dose of vasoactive drug used from the list of options. |
| Renal replacement therapy P* | Options: Yes, No | Use of renal replacement therapy. Any duration of RRT is considered as a 'Yes'. |
| Antimicrobial use S* | Options: Yes, No | Use of antimicrobial therapy. Even if only one dose has been administered this is considered as a 'Yes'. |
| Antimicrobial type^ | Dropdown list | <i>If 'Antimicrobial use' is 'Yes':</i> The type of antimicrobial from a drug list. |
| Antimicrobial type (Other)^ | Text | <i>If 'Antimicrobial type' is 'Other':</i> The type of other antimicrobial administered. |
| Systolic blood pressure P* | mmHg | First recorded Systolic BP within the first hour of admission to the ICU. |
| Diastolic blood pressure P* | mmHg | First recorded Diastolic BP within the first hour of admission to the ICU. |

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| Respiratory rate P^* | b/min | Self vent on admission: First recorded RR on admission to the ICU. Mechanical vent on admission: Last recorded RR prior to intubation. |
| Heart rate P^* | b/min | First recorded heart rate within the first hour of admission to the ICU |
| Temperature P^* | °F or °C | First recorded temperature within the first hour of admission to the ICU |
| Glasgow coma scale (eye) P^* | Score 1 - 4 | Self vent on admission: The first recorded eye response for GCS score on admission to ICU. Mechanical vent on admission: The last recorded eye response for GCS immediately prior to intubation. |
| Glasgow coma scale (verbal)* | Score 1- 5 | Self vent on admission: The first recorded verbal response for GCS score on admission to ICU. Mechanical vent on admission: The last recorded verbal response for GCS immediately prior to intubation. |
| Glasgow coma scale (motor)* | Score 1-6 | Self vent on admission: The first recorded motor response for GCS score on admission to ICU. Mechanical vent on admission: The last recorded motor response for GCS immediately prior to intubation. |
| Blood glucose [^] | mg/dl or g/dl or g/L or mmol/L | |
| Haemoglobin P^* | g/dl or g/l | Hb measured within the first hour of admission to ICU. If unavailable, provide the last reported Hb prior to admission (max 24 hrs prior). |
| Platelet count P^* | $\times 10^9/L$ or $K/\mu L$ or $10^3/mm^3$ or $\times 10^3/\mu L$ or cells/ μL or lakhs/ mm^3 | Platelet count measured within the first hour of admission to ICU. If unavailable last reported platelet count prior to admission (max 24 hrs prior). |
| Packed cell volume P^* | % or / | Also called the haematocrit. This is the volume percentage of red blood cells (RBC) in blood measured within the first hour of admission to ICU. If unavailable, provide the last reported PCV prior to admission (max 24 hrs prior). |
| White Blood cell count [^] | $10^9/L$ or $K/\mu L$ or cells/ mm^3 or $10^3/mm^3$ or lakhs/ mm^3 or cells/ μL or | WBC measured within the first hour of admission to ICU. If unavailable last reported measurement prior to admission (max 24 hrs prior) |

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| Serum sodium <i>P</i> [^] | mEq/L or mmol/L | Blood sodium measured within the first hour of admission to ICU. If unavailable, provide the last reported blood sodium prior to admission (max 24 hrs prior). |
| Serum potassium <i>P</i> [^] | mEq/L or mmol/L | Blood potassium measured within the first hour of admission to ICU. If unavailable, provide the last reported blood potassium prior to admission (max 24 hrs prior). |
| Serum HCO ₃ <i>P</i> [^] | mEq/L or mmol/L | Blood bicarbonate measured within the first hour of admission to ICU. If unavailable, provide the last reported blood bicarbonate prior to admission (max 24 hrs prior). |
| Serum creatinine <i>P</i> [^] | mg/dL or mmol/L or μ mol/L or mg/L | Blood creatinine measured within the first hour of admission to ICU. If unavailable, provide the last reported blood creatinine prior to admission (max 24 hrs prior). |
| Serum bilirubin [^] | mg/dL or mmol/L or μ mol/L | Blood bilirubin measured within the first hour of admission to ICU. If unavailable, provide the last reported blood creatinine prior to admission (max 24 hrs prior). |
| Blood urea <i>P</i> [^] | mg/dL or mmol/L or g/L | Blood urea measured within the first hour of admission to ICU. If unavailable last reported blood urea prior to admission (max 24 hrs prior). |
| Discharge | | |
| <i>Variable name</i> | <i>Data entry format</i> | <i>Definition for collection</i> |
| Date of ICU discharge <i>P</i> [*] | yyyy-mm-dd | The date on which the patient is discharged from or dies in the ICU. |
| Time of ICU discharge <i>P</i> [^] | hh:mm:ss | The time at which the patient is discharged from or dies in the ICU. If the patient was discharged or died at midnight, record the time of discharge as 23:59. |
| ICU discharge status <i>P</i> [*] | Dropdown list | Whether the patient is alive at the point of ICU discharge. |
| ICU discharge destination <i>P</i> [*] | Dropdown list | If 'ICU discharge status' is 'Alive' Indication of the location the patient is destined for immediately after ICU discharge. |
| CPR status [^] | Options: Yes, No | Score if the patient has had CPR (heart massage) during the ICU episode of care. Defibrillation and/or cardioversion without heart massage do not apply as CPR. |
| SARI diagnosis at discharge [*] | Options: Yes-confirmed, Yes-probable, No | Indicate if at discharge the patient has a clinically suspected or laboratory confirmed Severe Acute Respiratory Infection. |

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| SARI, yes* | Dropdown list | If 'SARI diagnosis at discharge' is 'Yes-confirmed' or 'Yes-probable': |
| SARI, other* | Text | |
| Type of test | Dropdown list | If 'SARI diagnosis at discharge' is 'Yes-confirmed' or 'Yes-probable': |
| Other type of test | Text | If 'Type of test' is 'Other': |
| Discharge note | Text | Any notes about the patient at the time of discharge or any post-discharge care instructions. |
| Withdrawal of treatment <i>P</i> * | Options: Yes, No | Decision by the clinical team to stop treatment. |
| Limitation of treatment <i>P</i> [^] | Options: Yes, No | Decision by the clinical team to limit treatment. |
| Left against medical advice [^] | Options: Yes, No | If 'ICU discharge status' is 'Alive' The patient leaves ICU against the advice of their medical team |
| Discharge upon patient request [^] | Options: Yes, No | If 'ICU discharge status' is 'Alive' Decision to discharge from ICU made by patient and facilitated by the clinical team (e.g. transfer to another hospital at patient's request) |
| Date of hospital discharge <i>P</i> [^] | yyyy-mm-dd | The date on which the patient is discharged from-, or dies in the hospital. |
| Time of hospital discharge [^] | hh:mm:ss | The time at which the patient is discharged from-, or dies in the hospital. If the patient was discharged or died at midnight, record the time of discharge as 23:59. |
| Hospital discharge status [^] | Options: Alive, Dead, Cancel | Whether the patient is alive at the point of hospital discharge |
| Hospital destination [^] | Dropdown list | If 'Hospital discharge status' is 'Alive' Indication of the location the patient is destined for immediately after hospital discharge. |

Risk predictions in APACHE II are based on:

The APACHE II score – a score from 0 to 71 consisting of weights for age at admission to your unit (0 to 6 points) and severe conditions in the past medical history (0 to 5 points) plus an Acute Physiology Score (0 to 60 points) based on weightings for deviations from normal in the following twelve physiological parameters during the first hour in the unit.³ In the absence of information available in the first hour, information from the first 24hrs is used.

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- o temperature
- o mean arterial pressure
- o heart rate
- o respiratory rate
- o A-aDO₂ (if FiO₂ ≥ 0.5) or PaO₂ (if FiO₂ < 0.5)
- o arterial pH (or serum bicarbonate if no arterial blood gas recorded)
- o serum sodium
- o serum potassium
- o serum creatinine (with double weighting for acute renal failure)
- o haematocrit (estimated from haemoglobin)
- o white blood cell count
- o Glasgow Coma Score (assumed to be normal for patients sedated or paralysed and sedated for the whole of the first 24 hours in the unit, or for the entire stay if less than 24 hours)

Admission directly from theatre following emergency surgery

Diagnostic category (weightings for 58 non-surgical diagnoses and 50 surgical diagnoses, plus seven body systems, and a weighting for CPR within 24 hours prior to admission that overrides any other diagnostic category)

Exclusions

Admissions are excluded from the calculation of the APACHE II score if:

- a. age at admission to your unit is less than 16 years; or
- b. length of stay in your unit is less than 8 hours.

Additionally, admissions are excluded from the calculation of an APACHE II risk prediction if:

- c. the admission is for primary burns;
- d. the admission is following coronary artery bypass graft (CABG) surgery;
- e. the admission is transferred in from another ICU; or
- f. all twelve physiological variables are missing.

Readmissions of the same patient within the same hospital stay and admissions missing ultimate hospital outcome are excluded from comparisons of observed and expected mortality

Risk predictions in E-TropICS are based on:

The E-TropICS score consists of 5 physiological variables measured on admission to the ICU and 2 laboratory values.

Temperature

Heart rate

GCS

Systolic Blood pressure

Mechanically ventilated

Hemoglobin

Blood urea

Definitions for calculation of quality indicators

| Indicator | Reference | Definition |
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| Early unplanned ICU readmission rate | doi:10.1097/MLR.0b013e318293c2fa | <p>Percentage of patients with an unplanned readmission to ICU within 48 hours of ICU discharge during the same hospitalization, per 100 patients eligible for readmission at point of discharge alive from ICU. Excludes: patients discharged from ICU for palliation or to die at home, and patients transferred to another ICU or another hospital.</p> <p>Numerator: total unplanned ICU readmissions within 48 hours of ICU discharge during the same hospital encounter. Excludes scheduled ICU admissions following elective procedures.</p> <p>Denominator: Total patients eligible for ICU readmission upon discharge alive from ICU.</p> |
| Length of ICU stay | doi:10.1097/01.CCM.000240233.01711.D9 | <p>Median (IQR) number of days patients spend in the ICU. Measured per episode of ICU care. Calculated using the interval (measured in hours) between the date and time of ICU admission and the date and time of ICU discharge. Rounded to the nearest 1 decimal place.</p> |
| Occupancy | doi:10.1097/MLR.0b013e318293c2fa | <p>Number of patients in the ICU in a given 24-hour period for at least 2 hours, standardized for each ICU and each year.</p> |
| ICU turnover | doi:10.1164/rccm.201304-0622OC | <p>Percentage of newly admitted patients to the ICU in the prior 24 hrs. Numerator: all admissions admitted or readmitted to the ICU in the preceding 24 hours. Denominator = total potential occupancy (=capacity) total available unoccupied ICU beds</p> |

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