**SINGAPORE UNIVERSITY DATATHON:**

Population: ventilated patients, on infusion with analgesia/sedation

What was their initial Rass score & pain score?

Post-administration of bolus/infusion: was there a subsequent change in RASS & pain scores? What was the change?

Is there variation in the way medication is applied? Does it align/correspond to the RASS & Pain scores?

Potential influencing factors: patient age, weight, post-surgical vs medical, surgical population: elective vs emergency, other?

**MIMIC database:**

* **RASS scale:**

itemid: 228096 Richmond-RAS Scale Richmond-RAS Scale metavision chartevents Pain/Sedation

See: <https://github.com/MIT-LCP/mimic-code/issues/171>

Schema: MIMIC\_ICU

Table: D\_ITEMS

Item ID: 228096

Richmond-RAS Scale Richmond-RAS Scale metavision chartevents Pain/Sedation

**Extract RASS scores from Chartevents table:**

SELECT \* FROM chartevents where itemid = '228096'

**NB: Important considerations re- D\_Items table:**

* D\_ITEMS is sourced from two *distinct* ICU databases. The main consequence is that there are duplicate ITEMID for each concept. For example, heart rate is captured both as an ITEMID of 211 (CareVue) and as an ITEMID of 220045 (Metavision). As a result, it is necessary to search for multiple ITEMID to capture a single concept across the entire database.

**Pain scores in MIMIC:**

<https://arxiv.org/ftp/arxiv/papers/1806/1806.05547.pdf>

D\_ITEMS

Item ID: 225813

Label: Baseline Pain Level

**Medications in MIMIC:**

<https://mimic.physionet.org/mimictables/prescriptions/>

**INPUTEVENTS table:**

Contains infusion & bolus administration data, includes start time & end time.

NB: A bolus will be listed as ending one minute after it started, i.e. ENDTIME = STARTTIME + 1 minute

**IDENTIFICATION OF SURGICAL PATIENTS:**

<https://mimic.physionet.org/mimictables/services/>

**Table:** Services

**Table source:** Hospital database.

**Table purpose:** Lists services that a patient was admitted/transferred under.

The services table describes the service that a patient was admitted under. While a patient can be physicially located at a given ICU type (say MICU), they are not necessarily being cared for by the team which staffs the MICU. This can happen due to a number of reasons, including bed shortage. The SERVICES table should be used if interested in identifying the type of service a patient is receiving in the hospital. For example, if interested in identifying surgical patients, the recommended method is searching for patients admitted under a surgical service.

Each service is listed in the table as an abbreviation - this is exactly how the data is stored in the hospital database. For user convenience, we have provided a description of each service type.

|  |  |
| --- | --- |
| **Service** | **Description** |
| CMED | Cardiac Medical - for non-surgical cardiac related admissions |
| CSURG | Cardiac Surgery - for surgical cardiac admissions |
| DENT | Dental - for dental/jaw related admissions |
| ENT | Ear, nose, and throat - conditions primarily affecting these areas |
| GU | Genitourinary - reproductive organs/urinary system |
| GYN | Gynecological - female reproductive systems and breasts |
| MED | Medical - general service for internal medicine |
| NB | Newborn - infants born at the hospital |
| NBB | Newborn baby - infants born at the hospital |
| NMED | Neurologic Medical - non-surgical, relating to the brain |
| NSURG | Neurologic Surgical - surgical, relating to the brain |
| OBS | Obstetrics - conerned with childbirth and the care of women giving birth |
| ORTHO | Orthopaedic - surgical, relating to the musculoskeletal system |
| OMED | Orthopaedic medicine - non-surgical, relating to musculoskeletal system |
| PSURG | Plastic - restortation/reconstruction of the human body (including cosmetic or aesthetic) |
| PSYCH | Psychiatric - mental disorders relating to mood, behaviour, cognition, or perceptions |
| SURG | Surgical - general surgical service not classified elsewhere |
| TRAUM | Trauma - injury or damage caused by physical harm from an external source |
| TSURG | Thoracic Surgical - surgery on the thorax, located between the neck and the abdomen |
| VSURG | Vascular Surgical - surgery relating to the circulatory system |

**ICD9 CODES in MIMIC:**

|  |  |
| --- | --- |
| **ICD9 CODE** | **Long\_title** |
| 9390 | Non-invasive mechanical ventilation |
| 9670 | Continuous invasive mechanical ventilation of unspecified duration |
| 9671 | Continuous invasive mechanical ventilation for less than 96 consecutive hours |
| 9672 | Continuous invasive mechanical ventilation for 96 consecutive hours or more |

**CODES FOR EXCLUSIONS:**

**Cardiac procedure codes, sourced from:** https://cdn-links.lww.com/permalink/pcc/a/pcc\_16\_6\_2015\_02\_18\_mansfield\_pccm-d-14-00220\_sdc1.pdf

35.0 Closed heart valvotomy (excludes percutaneous balloon valvuloplasty)

35.00 Closed heart valvotomy, unspecified valve

35.01 Closed heart valvotomy, aortic valve

35.02 Closed heart valvotomy, mitral valve

35.03 Closed heart valvotomy, pulmonary valve

35.04 Closed heart valvotomy, tricuspid valve

35.1 Open heart valvuloplasty without replacement

35.10 Open heart valvuloplasty without replacement, unspecified valve

35.11 Open heart valvuloplasty of aortic valve without replacement

35.12 Open heart valvuloplasty of mitral valve without replacement

35.13 Open heart valvuloplasty of pulmonary valve without replacement

35.14 Open heart valvuloplasty of tricuspid valve without replacement

35.20 Replacement of unspecified heart valve

35.21 Replacement of aortic valve with tissue graft

35.22 Other replacement of mitral valve with tissue graft

35.23 Replacement of mitral valve with tissue graft

35.24 Other replacement of mitral valve

35.25 Replacement of pulmonary valve with tissue graft

35.26 Other replacement of pulmonary valve

35.27 Replacement of tricuspid valve with tissue graft

35.28 Other replacement of tricuspid valve

35.31 Operations on papillary muscles

35.32 Operations on chordae tendinae

35.33 Annuloplasty

35.34 Infundibulectomy

35.35 Operations on trabeculae careae cordis

35.39 Operations on other structures adjacent to valves of heart

35.41 Enlargement of existing atrial septal defect

35.42 Creation of septal defect in heart

35.50 Repair of unspecified septal defect of heart with prosthesis

35.51 Repair of atrial septal defect with prosthesis, open technique

35.52 Repair of atrial septal defect with prosthesis, closed technique

35.53 Repair of ventricular septal defect with prosthesis

35.54 Repair of endocardial cushion defect with prosthesis

35.55 Repair of ventricular septal defect with prosthesis, closed technique

35.60 Repair of unspecified septal defect of heart with tissue graft

35.61 Repair of atrial septal defect with tissue graft

35.62 Repair of ventricular septal defect with tissue graft

35.63 Repair of endocardial cushion defect with tissue graft

35.70 Other and unspecified repair of unspecified septal defect of heart

35.71 Other and unspecified repair of atrial septal defect

35.72 Other and unspecified repair of ventricular septal defect

35.73 Other and unspecified repair of endocardial cushion defect

35.81 Repair of tetralogy of Fallot

35.82 Total repair of total anomalous pulmonary venous connection

35.83 Total repair of truncus arteriosus

35.84 Total correction of transposition of the great vessels, not elsewhere classified

35.91 Interatrial transposition of venous return

35.92 Creation of conduit between right ventricle and pulmonary artery

35.93 Creation of conduit between left ventricle and aorta

35.94 Creation of conduit between atrium and pulmonary artery

35.95 Revision of corrective procedure on heart

35.96 Percutaneous valvuloplasty

35.98 Other operations on septa of heart

35.99 Other operations on valves of heart

36.03 Open chest coronary angioplasty

36.09 Other removal of coronary artery obstruction

36.1 Bypass anastomosis for heart revascularization

36.10 Aortocoronary bypass anastomosis for heart revascularization, not otherwise specified

36.11 Aortocoronary bypass of one coronary artery

36.12 Aortocoronary bypass of two coronary arteries

36.13 Aortocoronary bypass of three coronary arteries

36.14 Aortocoronary bypass of four or more coronary arteries

36.15 Single internal mammary-coronary artery bypass

36.16 Double internal mammary-coronary artery bypass

36.17 Abdominal coronary artery bypass

36.19 Other bypass anastomosis for heart revascularization

36.2 Heart revascularization by arterial implant

36.31 Open chest transmyocardial revascularization

36.32 Other transmyocardial revascularization

36.33 Endoscopic transmyocardial revascularization

36.39 Other heart revascularization

36.91 Repair of aneurysm of coronary vessel

36.99 Other operations on vessels of heart

37.0 Pericardiocentesis

37.10 Incision of the heart, not otherwise specified

37.11 Cardiotomy

37.12 Pericardiotomy

37.24 Biopsy of pericardium

37.31 Pericardiectomy

37.32 Excision of aneurysm of heart

37.33 Excision or destruction of other lesion or tissue of heart, open approach

37.35 Partial ventriculectomy

37.41 Implantation of prosthetic cardiac support device around the heart

37.49 Other repair of heart and pericardium

37.67 Implantation of cardiomyostimulation system

37.70 Initial insertion of lead, not otherwise specified

37.71 Initial insertion of transvenous lead into ventricle

37.72 Initial insertion of transvenous leads into atrium and ventricle

37.73 Initial insertion of transvenous leads into atrium

37.74 Insert/replace epicardial lead into epicardium

37.75 Revision of lead

37.76 Replacement of transvenous atrial and/or ventricular leads

37.77 Removal of leads without replacement

37.78 Insertion of temporary transvenous pacemaker system

37.79 Revision or relocation of pacemaker pocket

37.80 Insertion of permanent pacemaker, initial or replacement, type not specified

37.81 Initial insertion of single-chamber device, not specified as rate response

37.82 Initial insertion of single-chamber device, rate responsive

37.83 Initial insertion of dual-chamber device

37.85 Replacement of any type pacemaker device with single-chamber device, not specified as rate responsive

37.86 Replacement of any type pacemaker device with single-chamber device, rate responsive

37.87 Replacement of any type pacemaker device with dual-chamber device

37.89 Revision or removal of pacemaker device

37.90 Insertion of left atrial appendage device

37.91 Open cardiac massage

37.92 Injection of therapeutic substance into heart

37.93 Injection of therapeutic substance into pericardium

37.94 Implantation or replacement of automatic cardioverter/defibrillator, total system

37.95 Implantation of automatic cardioverter/defibrillator leads only

37.96 Implantation of automatic cardioverter/defibrillator pulse generator only

37.97 Replacement of automatic cardioverter/defibrillator leads only

37.98 Replacement of automatic cardioverter/defibrillator pulse generator only

37.99 Other cardiac procedures

38.04 Incision of vessels, aorta

38.05 Incision of vessels, other thoracic vessels

38.14 Endarterectomy, aorta

38.15 Endarterectomy, other thoracic vessels

38.34 Resection of vessel with anastomosis, aorta

38.35 Resection of vessel with anastomosis, other thoracic vessels

38.44 Resection of vessel with replacement, aorta

38.45 Resection of vessel with replacement, other thoracic vessels

38.65 Other excision of vessels, thoracic vessels

38.7 Interruption of vena cava

38.85 Other surgical occlusion of vessels, thoracic vessels

39.0 Systemic to pulmonary artery shunt

39.21 Caval-pulmonary anastomosis

39.22 Aorta-subclavian artery bypass

39.23 Other intrathoracic vascular shunt or bypass

39.54 Reentry operation (aorta)

39.57 Repair of blood vessel with synthetic patch graft

39.58 Repair of blood vessel with unspecified type of patch graft

39.64 Intraoperative cardiac pacemaker

**Neurological/neurosurgical diagnoses:**

**ECMO:**

|  |  |
| --- | --- |
| **ICD9 procedure code** | **Description** |
| 3762 | Insertion of temporary non-implantable extracorporeal circulatory assist device |
| 3765 | Implant of single ventricular (extracorporeal) external heart assist system |
| 3965 | Extracorporeal membrane oxygenation [ECMO] |

**Palliative care:**

**D\_ICD\_DIAGNOSES table:**

**icd\_code** **Description**

**V667** **Encounter for palliative care**

**Z515** **Encounter for palliative care**

**Head injury:**