**Supplemental Digital Content 2**

Sharing ICU patient data responsibly under the SCCM/ESICM Joint Data Science Collaboration: the AmsterdamUMCdb example

Patrick J. Thoral, Jan M. Peppink, Ronald H. Driessen, Eric J.G. Sijbrands, Erwin J.O. Kompanje, Lewis Kaplan, Heatherlee Bailey, Jozef Kesecioglu, Maurizio Cecconi, Matthew Churpek, Gilles Clermont, Mihaela van der Schaar, Ari Ercole, Armand R.J. Girbes, Paul W.G. Elbers on behalf of the *AmsterdamUMCdb Collaborators* and the *SCCM/ESICM Joint Data Science Task Force*

Contents

[Data Format 2](#_Toc52136550)

[AmsterdamUMCdb Tables 3](#_Toc52136551)

[admissions 3](#_Toc52136552)

[drugitems 5](#_Toc52136553)

[freetextitems 7](#_Toc52136554)

[listitems 8](#_Toc52136555)

[numericitems 9](#_Toc52136556)

[procedureorderitems 10](#_Toc52136557)

[processitems 11](#_Toc52136558)

[References 12](#_Toc52136559)

# Data Format

Most current relational database systems, including electronic health records that are built on top of these systems, store data in a so called normalized format to reduce data redundancy and improve data integrity (1–3). This is of course an important aspect for *live* systems where names can be changed and new parameters will be added to prevent data inconsistencies.

As an example see the following table 1.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| measureid | time | item | value | unit |
| 1 | 0:00 | HR | 65 | /min |
| 2 | 1:00 | HR | 81 | bpm |
| 3 | 2:00 | Heart rate | 120 | /min |
| 4 | 0:00 | ABP mean | 66 | mmHg |
| 5 | 1:00 | ABP mean | 53 | mmHg |
| 6 | 2:00 | ABP mean | 40 | °C |

Table 1. Non-normalized table

This table contains measurements of both heart rate and mean arterial blood pressure for three points in time (0:00h, 1:00h and 2:00h). Even though most humans will probably not have any difficulty in getting the three heart rates from the table, the system may not retrieve the correct data due to *inconsistent* data entry (**Heart rate** and **HR**). In addition, these problems may arise, when it was decided that the abbreviation **HR** needed to be replaced by **Heart Rate**, but not all records were updated to reflect this. Since most measurements have fixed units (i.e. blood pressure and mmHg) the displayed unit information is *redundant* and in the case of the **ABP mean** measurement at 2:00h may even lead to wrong interpretations, when a wrong unit was entered.

Most system will therefore store the data in different tables (for example **measurements**, **items** and **units**) to prevent inconsistency and reduce redundancy.

|  |  |  |  |
| --- | --- | --- | --- |
| measureid | time | itemid | value |
| 1 | 0:00 | 6640 | 65 |
| 2 | 1:00 | 6640 | 81 |
| 3 | 2:00 | 6640 | 120 |
| 4 | 0:00 | 6642 | 66 |
| 5 | 1:00 | 6642 | 53 |
| 6 | 2:00 | 6642 | 40 |

Table 2. Measurements

|  |  |  |
| --- | --- | --- |
| itemid | item | unitid |
| 6640 | Heart rate | 15 |
| 6641 | ABP systolic | 173 |
| 6642 | ABP mean | 173 |

Table 3. Items

|  |  |
| --- | --- |
| unitid | unit |
| 15 | /min |
| 59 | °C |
| 173 | mmHg |

Table 4. Units

This prevents data inconsistency, and reduces redundant data because the names of the items (**Heart rate**, **ABP mean**) from the measurements tables are replaced by identifiers instead of the actual text. This saves both storage space and often increases performance which are important aspects for *live* EHR's. However, Table 2 is difficult to understand because the relevant information is segmented into different tables. Especially when information from different tables is needed together (often for business or general data analytics), it’s an acceptable approach to de-normalize the data into a larger table that contains all relevant elements (4). An example can be seen in Table 5:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| measureid | time | itemid | item | value | unitid | unit |
| 1 | 0:00 | 6640 | Heart rate | 65 | 15 | /min |
| 2 | 1:00 | 6640 | Heart rate | 81 | 15 | /min |
| 3 | 2:00 | 6640 | Heart rate | 120 | 15 | /min |
| 4 | 0:00 | 6642 | ABP systolic | 66 | 173 | mmHg |
| 5 | 1:00 | 6642 | ABP systolic | 53 | 173 | mmHg |
| 6 | 2:00 | 6642 | ABP systolic | 40 | 173 | mmHg |

Table 5. De-normalized table.

This de-normalization approach was applied to all released tables for AmsterdamUMCdb. We believe this simplified view of the available data helps understanding by both clinical researchers as well as data scientists.

# AmsterdamUMCdb Tables

The following section contains a description of the data stored in the tables of AmsterdamUMCdb. We highly recommend to access the most recent version of the descriptions, including sample code at the AmsterdamUMCdb GitHub: <https://github.com/AmsterdamUMC/AmsterdamUMCdb>.

## admissions

This table contains all admissions and demographic data of the patients admitted to the intensive care unit (ICU, Dutch abbreviation: IC) or medium care unit (MCU, high dependency unit, Dutch abbreviation: MC).

**Note**: reason for admission can be found by examining the Apache II diagnostic categories from the listitems table.

### Fields

|  |  |  |
| --- | --- | --- |
| Name | Type | Description |
| patientid | integer | unique value to identify individual patients throughout their admission(s) |
| admissionid | integer | unique value to identify the admission to the ICU. Patients may have multiple admissionid's during the same or another hospitalization, when they are discharge from the ICU or MC unit. Admissionid is used as an identifier in all other tables. |
| admissioncount | integer | for each patient, each additional ICU/MCU admission will increase this counter by one |
| location | string | the department the patient has been admitted to, either *IC*, *MC* or both *(IC&MC or MC&IC)* |
| urgency | bit | determines wheter the admission was urgent (1) (i.e. unplanned) or not (0) (planned) |
| origin | string | department the patient originated from (e.g. Emergency department, regular ward) |
| admittedat | integer | number of milliseconds since the first admission. For the first admission this is set to zero. |
| admissionyeargroup | string | year of admission, categorised |
| dischargedat | integer | time of discharge in number of milliseconds since the first admission |
| lengthofstay | integer | length of stay of the admission in hours |
| destination | string | department the patient has been discharged to or 'Overleden' if the patient died during the ICU/MCU admission |
| gender | string | gender, 'Man' for male, 'Vrouw' for female |
| agegroup | string | age at admission (years), categorised |
| dateofdeath | integer | the date on which the patient died calculated as the number of milliseconds since the first admission, if applicable (non-null) |
| weightgroup | string | weight at admission (kg), categorised |
| weightsource | string | method used to determine the weight at ICU/MCU admission, either measured ('gemeten'), estimated ('geschat') or asked ('anamnestisch') |
| heightgroup | string | height of the patient (cm), categorised |
| heightsource | string | method used to determine the height at ICU/MCU admission, either measured ('gemeten'), estimated ('geschat') or asked ('anamnestisch') |
| specialty | string | medical specialty the patient has been admitted for |

### Example records

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **patientid** | **admissionid** | **admissioncount** | **location** | **urgency** | **origin** | **admittedat** | **admissionyeargroup** | **dischargedat** | **lengthofstay** | **destination** | **gender** | **agegroup** | **dateofdeath** | **weightgroup** | **weightsource** | **heightgroup** | **heightsource** | **specialty** |
| **0** | 0 | 0 | 1 | IC | 0 | None | 0 | 2003-2009 | 148800000 | 42 | 16 | Vrouw | 80+ | NaN | 60-69 | Anamnestisch | 160-169 | Anamnestisch | Cardiochirurgie |
| **1** | 1 | 1 | 1 | IC | 0 | None | 0 | 2010-2016 | 96120000 | 26 | 15 | Man | 60-69 | NaN | 70-79 | Anamnestisch | 170-179 | Anamnestisch | Cardiochirurgie |
| **2** | 2 | 2 | 1 | IC | 1 | Eerste Hulp afdeling zelfde ziekenhuis | 0 | 2010-2016 | 84240000 | 23 | 15 | Man | 60-69 | NaN | 90-99 | Anamnestisch | 180-189 | Anamnestisch | Cardiochirurgie |
| **3** | 4 | 4 | 1 | IC&MC | 0 | Verpleegafdeling zelfde ziekenhuis | 0 | 2010-2016 | 180900000 | 50 | 19 | Man | 70-79 | NaN | 70-79 | Anamnestisch | 170-179 | Anamnestisch | Cardiochirurgie |
| **4** | 5 | 5 | 1 | IC | 1 | Eerste Hulp afdeling zelfde ziekenhuis | 0 | 2010-2016 | 246420000 | 69 | 31 | Man | 50-59 | NaN | 60-69 | Geschat | 160-169 | Gemeten | Longziekte |
| **5** | 6 | 6 | 1 | IC | 1 | Verpleegafdeling ander ziekenhuis | 0 | 2010-2016 | 173460000 | 48 | 45 | Vrouw | 80+ | NaN | 70-79 | Geschat | 160-169 | Geschat | Neurochirurgie |
| **6** | 7 | 7 | 1 | MC | 0 | Verpleegafdeling zelfde ziekenhuis | 0 | 2010-2016 | 148680000 | 42 | 41 | Man | 70-79 | NaN | 70-79 | Gemeten | 170-179 | Gemeten | Nefrologie |
| **7** | 8 | 8 | 1 | IC | 0 | None | 0 | 2003-2009 | 84720000 | 24 | 15 | Man | 50-59 | NaN | 100-109 | Geschat | 170-179 | Anamnestisch | Cardiochirurgie |
| **8** | 9 | 9 | 1 | IC | 0 | None | 0 | 2003-2009 | 242040000 | 67 | 15 | Vrouw | 70-79 | NaN | 70-79 | None | 159- | None | Cardiochirurgie |
| **9** | 10 | 10 | 1 | IC | 1 | None | 0 | 2010-2016 | 64140000 | 18 | 40 | Man | 60-69 | NaN | 80-89 | Anamnestisch | 180-189 | Anamnestisch | Traumatologie |

## drugitems

The drugitems table contains all administered medication including fluids, (parenteral) feeding and blood transfusions during the stay on the ICU. Both bolus injections as well as continous drips are stored in this table. All items have an associated admissionid from the admissions table.

### Fields

|  |  |  |
| --- | --- | --- |
| Name | Type | Description |
| admissionid | integer | links the item with the admissionid in the admissions table |
| orderid | integer | uniquely identifies this medication record |
| ordercategoryid | integer | id of medication category, e.g. antibiotics, fluids, etc. |
| ordercategory | string | name of medication category e.g. antibiotics, fluids, etc. |
| itemid | integer | id of the medication name |
| item | string | medication name |
| isadditive | bit | shows whether this order is an additive, meaning it has been added to a parent solution with the same orderid |
| isconditional | bit | shows whether the order is conditional, meaning the health care provider, should verify if the order should be given at the planned date and time |
| rate | float | rate of medication infusion, expressed as a volume (amount of fluid) per time unit. Rate can be set to 0 for bolus medication (injections) |
| rateunit | string | unit of the infusion rate (e.g. ml/hour) |
| rateunitid | integer | id of the volume unit of the infusion rate |
| ratetimeunitid | integer | id of the time unit of the infusion rate |
| doserateperkg | bit | shows whether the dose rates (if applicable) are dosed by patient weight (e.g. 'mcg/kg/min' instead of 'mcg/min'). In contrast to prescribing medication for pediatric patients, most dose rates for adult intensive care patients are **not** weight based. |
| dose | float | prescribed dose, expressed as either an absolute dose (e.g. doseunit = 'mg') or dose per time unit (e.g. doserateunit = 'mg/hour') |
| doseunit | string | unit of prescribed dose (e.g. mg) |
| doserateunit | string | time unit of infusion rate (e.g. hour) |
| doseunitid | integer | id of doseunit |
| doserateunitid | integer | id of doserateunit |
| administered | float | administered dose, which may or may not be the same as prescribed dose |
| administeredunit | string | unit of administered dose (e.g. mg) |
| administeredunitid | integer | id of administeredunit |
| action | string | defines the reason for documenting (i.e. new bag/syringe, pause, restart, stopped) |
| start | integer | start time of medication infusion in milliseconds from the first admission |
| stop | integer | stop time of medication infusion in milliseconds from the first admission |
| duration | integer | duration of medication infusion (stop - start) in minutes |
| solutionitemid | integer | id of the solution, if any, used to prepare the medication |
| solutionitem | string | name of the solution, if any, used to prepare the medication |
| solutionadministered | float | amount of solution administered |
| solutionadministeredunit | string | unit of solution administered (e.g. ml) |
| fluidin | float | amount of fluid volume administered in ml, including the solution |
| iscontinuous | bit | determines wheter this order is continuous, i.e. restart on empty infusion bag |

### Example records

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **admissionid** | **orderid** | **ordercategoryid** | **ordercategory** | **itemid** | **item** | **isadditive** | **isconditional** | **rate** | **rateunit** | **rateunitid** | **ratetimeunitid** | **doserateperkg** | **dose** | **doseunit** | **doserateunit** | **doseunitid** | **doserateunitid** | **administered** | **administeredunit** | **administeredunitid** | **action** | **start** | **stop** | **duration** | **solutionitemid** | **solutionitem** | **solutionadministered** | **solutionadministeredunit** | **fluidin** | **iscontinuous** |
| **0** | 2808 | 6527196 | 29 | Niet iv CZS/Sedatie/Analgetica | 6891 | Paracetamol | 0 | 0 | NaN | None | None | None | 0 | 1000.0 | mg | None | 10 | NaN | 1000.0 | mg | 10 | Nieuwe toediening | 498660000 | 498720000 | 1 | NaN | None | NaN | None | 0.0 | 0 |
| **1** | 2808 | 6527230 | 42 | Voeding Drinken | 15114 | Vruchtensap 200ml | 0 | 0 | NaN | None | None | None | 0 | 200.0 | ml | min | 6 | 4.0 | 200.0 | ml | 6 | Nieuwe portie | 500460000 | 500520000 | 1 | NaN | None | NaN | None | 200.0 | 0 |
| **2** | 2808 | 6527283 | 42 | Voeding Drinken | 7350 | Water 150ml | 0 | 0 | NaN | None | None | None | 0 | 150.0 | ml | min | 6 | 4.0 | 150.0 | ml | 6 | Nieuwe portie | 503580000 | 503640000 | 1 | NaN | None | NaN | None | 150.0 | 0 |
| **3** | 2808 | 6527425 | 23 | Injecties CZS/Sedatie/Analgetica | 6910 | Piritramide (Dipidolor) | 0 | 0 | NaN | None | None | None | 0 | 10.0 | mg | None | 10 | NaN | 10.0 | mg | 10 | Nieuwe toediening | 505860000 | 505920000 | 1 | NaN | None | NaN | None | 0.0 | 0 |
| **4** | 2808 | 6527467 | 119 | Niet IV Groot Volume | 13498 | Macrogol (Movicolon) | 0 | 0 | 0.0 | None | None | None | 0 | 1.0 | Sachet | None | 305 | NaN | 1.0 | Sachet | 305 | Nieuwe toediening | 505860000 | 505920000 | 1 | 8991.0 | Aquadest Medicatie | 50.0 | ml | 50.0 | 0 |
| **5** | 2808 | 6527469 | 29 | Niet iv CZS/Sedatie/Analgetica | 12535 | Citalopram (Cipramil) | 0 | 0 | NaN | None | None | None | 0 | 20.0 | mg | None | 10 | NaN | 20.0 | mg | 10 | Nieuwe toediening | 505860000 | 505920000 | 1 | NaN | None | NaN | None | 0.0 | 0 |
| **6** | 2808 | 6527471 | 21 | Niet iv Antimicrobiele middelen | 9029 | Amoxicilline/Clavulaanzuur (Augmentin) | 0 | 0 | NaN | None | None | None | 0 | 625.0 | mg | None | 10 | NaN | 625.0 | mg | 10 | Nieuwe toediening | 505860000 | 505920000 | 1 | NaN | None | NaN | None | 0.0 | 0 |
| **7** | 2808 | 6527529 | 42 | Voeding Drinken | 15016 | Water 200ml | 0 | 0 | NaN | None | None | None | 0 | 200.0 | ml | min | 6 | 4.0 | 200.0 | ml | 6 | Nieuwe portie | 513720000 | 513780000 | 1 | NaN | None | NaN | None | 200.0 | 0 |
| **8** | 2808 | 6527531 | 42 | Voeding Drinken | 15015 | Water 100ml | 0 | 0 | NaN | None | None | None | 0 | 100.0 | ml | min | 6 | 4.0 | 100.0 | ml | 6 | Nieuwe portie | 513720000 | 513780000 | 1 | NaN | None | NaN | None | 100.0 | 0 |
| **9** | 2808 | 6527532 | 42 | Voeding Drinken | 15017 | Water 250ml | 0 | 0 | NaN | None | None | None | 0 | 250.0 | ml | min | 6 | 4.0 | 250.0 | ml | 6 | Nieuwe portie | 513720000 | 513780000 | 1 | NaN | None | NaN | None | 250.0 | 0 |

## freetextitems

The freetextitems table contains all observations, including laboratory results, that store text (non-numeric) data. Personal data, including references to hospital staff have been removed. All items have an associated admissionid from the admissions table.

### Fields

|  |  |  |
| --- | --- | --- |
| Name | Type | Description |
| admissionid | integer | links the items with the admissionid in the admissions table |
| itemid | integer | id to identify the type of result |
| item | string | type of result |
| value | string | value of this text result |
| comment | string | comment associated with this result |
| measuredat | integer | time associated with this result in milliseconds since the first admission. Negative results imply that the sample was drawn before the first ICU admission |
| registeredat | integer | time the result was saved to the database in milliseconds since the first admission. Negative results imply that the sample was drawn before the first ICU admission. |
| registeredby | string | user group that updated the result ('System') |
| updatedat | integer | time the result was updated, in milliseconds since the first admission |
| updatedby | string | user group that updated the result ('System') |
| islabresult | bit | determines wheter the observation is a labresult. Currently, only freetext labresults have been released |

### Example records

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **admissionid** | **itemid** | **item** | **value** | **comment** | **measuredat** | **registeredat** | **registeredby** | **updatedat** | **updatedby** | **islabresult** |
| **0** | 1064 | 11646 | Afname (bloed) | Art. | None | 933720000 | 933720000 | Systeem | 1090119264 | Systeem | 1 |
| **1** | 1064 | 11646 | Afname (bloed) | Art. | None | 952500000 | 952500000 | Systeem | 1090124180 | Systeem | 1 |
| **2** | 1064 | 11646 | Afname (bloed) | Art. | None | 976920000 | 976920000 | Systeem | 1090129377 | Systeem | 1 |
| **3** | 1064 | 11646 | Afname (bloed) | Art. | None | 981600000 | 981600000 | Systeem | 1090133484 | Systeem | 1 |
| **4** | 1064 | 11646 | Afname (bloed) | Art. | None | 1007160000 | 1007160000 | Systeem | 1090137480 | Systeem | 1 |
| **5** | 1064 | 11646 | Afname (bloed) | Art. | None | 1025280000 | 1025280000 | Systeem | 1090139154 | Systeem | 1 |
| **6** | 1064 | 11646 | Afname (bloed) | Art. | None | 1037160000 | 1037160000 | Systeem | 1090142714 | Systeem | 1 |
| **7** | 1064 | 11646 | Afname (bloed) | Art. | None | 1069320000 | 1069320000 | Systeem | 1090056954 | Systeem | 1 |
| **8** | 1064 | 11646 | Afname (bloed) | Art. | None | 1082340000 | 1082340000 | Systeem | 1090059330 | Systeem | 1 |
| **9** | 1064 | 11646 | Afname (bloed) | Art. | None | 1097580000 | 1097580000 | Systeem | 1119017974 | Systeem | 1 |

## listitems

The listitems table contains all categorical observations, e.g. based on a selection from a list, like type of heart rhytm, ventilatory mode, etc. All items have an associated admissionid from the admissions table. This table also contains the reason for ICU admission, according to the APACHE II or IV diagnostic codes.

### Fields

|  |  |  |
| --- | --- | --- |
| Name | Type | Description |
| admissionid | integer | links the items with the admissionid in the admissions table |
| itemid | integer | id to identify the type of observation |
| item | string | type of observation |
| value | string | value of this observation |
| measuredat | integer | time associated with this observation in milliseconds since the first admission. Negative results imply that the sample was drawn before the first ICU admission |
| registeredat | integer | time the result was saved in the database in milliseconds since the first admission. Negative results imply that the sample was drawn before the first ICU admission. |
| registeredby | string | user group that documented the observation, e.g. nurses, physicians or NULL for linked devices |
| updatedat | integer | time of updating the observation in milliseconds since first admission |
| updatedby | string | user group that documented the observation, e.g. nurses, physicians or NULL for linked devices |
| islabresult | boolean | determines whether the observation is a labresult. Currently, only item 'Afnameplaats' is a labresult, used to determine the location of sample drawing during down-time of the lab or hospital system. |

### Example records

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **admissionid** | **itemid** | **item** | **valueid** | **value** | **measuredat** | **registeredat** | **registeredby** | **updatedat** | **updatedby** | **islabresult** |
| **0** | 0 | 6671 | Hartritme | 1 | NSR | 20520000 | 21480000 | ICV\_IC-Verpleegkundig | 21480000 | ICV\_IC-Verpleegkundig | 0 |
| **1** | 0 | 6671 | Hartritme | 1 | NSR | 22320000 | 29400000 | ICV\_IC-Verpleegkundig | 29400000 | ICV\_IC-Verpleegkundig | 0 |
| **2** | 0 | 6671 | Hartritme | 1 | NSR | 25920000 | 29460000 | ICV\_IC-Verpleegkundig | 29460000 | ICV\_IC-Verpleegkundig | 0 |
| **3** | 0 | 6671 | Hartritme | 1 | NSR | 29520000 | 29460000 | ICV\_IC-Verpleegkundig | 29460000 | ICV\_IC-Verpleegkundig | 0 |
| **4** | 0 | 6671 | Hartritme | 1 | NSR | 33120000 | 33300000 | ICV\_IC-Verpleegkundig | 33300000 | ICV\_IC-Verpleegkundig | 0 |
| **5** | 0 | 6671 | Hartritme | 1 | NSR | 36720000 | 36960000 | ICV\_IC-Verpleegkundig | 36960000 | ICV\_IC-Verpleegkundig | 0 |
| **6** | 0 | 6671 | Hartritme | 1 | NSR | 40320000 | 40440000 | ICV\_IC-Verpleegkundig | 40440000 | ICV\_IC-Verpleegkundig | 0 |
| **7** | 0 | 6671 | Hartritme | 1 | NSR | 43920000 | 45540000 | ICV\_IC-Verpleegkundig | 45540000 | ICV\_IC-Verpleegkundig | 0 |
| **8** | 0 | 6671 | Hartritme | 1 | NSR | 51120000 | 51300000 | ICV\_IC-Verpleegkundig | 51300000 | ICV\_IC-Verpleegkundig | 0 |
| **9** | 0 | 6671 | Hartritme | 1 | NSR | 58320000 | 62700000 | ICV\_IC-Verpleegkundig | 62700000 | ICV\_IC-Verpleegkundig | 0 |

## numericitems

The numericitems table contains all numerical measurements and observations, including vital parameters, data from medical devices, lab results, outputs from drains and foley-catheters, scores etc. All items have an associated admissionid from the admissions table.

### Fields

|  |  |  |
| --- | --- | --- |
| Name | Type | Description |
| admissionid | integer | links the items with the admissionid in the admissions table |
| itemid | integer | id to identify the type of observation |
| item | string | name of the observation |
| tag | string | used in some lab results to modify a value (e.g tag = '<' and value = 0.05, to demonstrate that a value is lower than the displayed value). |
| unitid | integer | id of the unit of the observation. |
| unit | string | unit of the observation (e.g. mmHg). |
| comment | string | user specified comment. Comments may have been removed ('Opmerking verwijderd') due to containing personal data. |
| value | float | value of the observation |
| measuredat | integer | time associated with this observation, expressed as milliseconds since the first ICU admission. Negative values imply that the observation (e.g. lab result) was performed before the first ICU admission |
| registeredat | integer | time the result was stored in the database, expressed as milliseconds since the first admission. Negative values imply that the observation (e.g. lab result) was performed before the first ICU admission. For (automatic) lab results this value is the same as *measuredat* are the same. |
| registeredby | string | the user group that entered the result, e.g. nurses, physicians or NULL for linked devices |
| updatedat | integer | time the observation was updated in milliseconds from the first ICU admission. |
| updatedby | string | the user group that entered the observation, e.g. nurses, physicians or NULL for linked devices |
| islabresult | bit | determines whether the observation is a lab result (islabresult=1). |
| fluidout | integer | the amount of fluid in ml that was removed from the patient (e.g. urine, drain). |

### Example records

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **admissionid** | **itemid** | **item** | **tag** | **value** | **unitid** | **unit** | **comment** | **measuredat** | **registeredat** | **registeredby** | **updatedat** | **updatedby** | **islabresult** | **fluidout** |
| **0** | 0 | 6640 | Hartfrequentie |  | 73.0 | 15 | /min | Opmerking verwijderd | 33120000 | 33300000 | ICV\_IC-Verpleegkundig | 33300000 | ICV\_IC-Verpleegkundig | 0 | None |
| **1** | 0 | 6640 | Hartfrequentie |  | 77.0 | 15 | /min | Opmerking verwijderd | 36720000 | 36960000 | ICV\_IC-Verpleegkundig | 36960000 | ICV\_IC-Verpleegkundig | 0 | None |
| **2** | 0 | 6640 | Hartfrequentie |  | 77.0 | 15 | /min | Opmerking verwijderd | 87120000 | 87780000 | ICV\_IC-Verpleegkundig | 87780000 | ICV\_IC-Verpleegkundig | 0 | None |
| **3** | 0 | 6640 | Hartfrequentie |  | 78.0 | 15 | /min | Opmerking verwijderd | 29520000 | 29460000 | ICV\_IC-Verpleegkundig | 29469867 | ICV\_IC-Verpleegkundig | 0 | None |
| **4** | 0 | 6640 | Hartfrequentie |  | 78.0 | 15 | /min | Opmerking verwijderd | 40320000 | 40440000 | ICV\_IC-Verpleegkundig | 40440000 | ICV\_IC-Verpleegkundig | 0 | None |
| **5** | 0 | 6640 | Hartfrequentie |  | 78.0 | 15 | /min | Opmerking verwijderd | 90720000 | 90840000 | ICV\_IC-Verpleegkundig | 90840000 | ICV\_IC-Verpleegkundig | 0 | None |
| **6** | 0 | 6640 | Hartfrequentie |  | 79.0 | 15 | /min | Opmerking verwijderd | 43920000 | 45540000 | ICV\_IC-Verpleegkundig | 45540000 | ICV\_IC-Verpleegkundig | 0 | None |
| **7** | 0 | 6640 | Hartfrequentie |  | 79.0 | 15 | /min | Opmerking verwijderd | 144720000 | 144720000 | ICV\_IC-Verpleegkundig | 144720000 | ICV\_IC-Verpleegkundig | 0 | None |
| **8** | 0 | 6640 | Hartfrequentie |  | 82.0 | 15 | /min | Opmerking verwijderd | 25920000 | 26160000 | ICV\_IC-Verpleegkundig | 26160000 | ICV\_IC-Verpleegkundig | 0 | None |
| **9** | 0 | 6640 | Hartfrequentie |  | 83.0 | 15 | /min | Opmerking verwijderd | 20520000 | 20580000 | ICV\_IC-Verpleegkundig | 20580000 | ICV\_IC-Verpleegkundig | 0 | None |

## procedureorderitems

The procedureorderitems table contains all orders for procedures and tasks, such drawing blood, perfforminroutine ICU nursing care and scoring. Please note that many of these tasks will lead to a result or observation, that can be found in the freetextitems, listitems or numericitems tables, depending on the type of documentation required. All items have an associated admissionid from the admissions table.

### Fields

|  |  |  |
| --- | --- | --- |
| Name | Type | Description |
| admissionid | integer | links the items with the admissionid in the admissions table |
| orderid | integer | unique number identifiying this order |
| ordercategoryid | integer | id of procedure category |
| ordercategoryname | string | name of procedure category |
| itemid | integer | id of procedure name |
| item | string | procedure name |
| registeredat | integer | time the result was stored in the database, expressed as milliseconds since the first ICU admission. |
| registeredby | string | user group that entered the result, e.g. nurses, physicians, etc. |

### Example records

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **admissionid** | **orderid** | **ordercategoryid** | **ordercategoryname** | **itemid** | **item** | **registeredat** | **registeredby** |
| **0** | 0 | 1994476 | 101 | Opdr. Huid | 12896 | Decubitus score | 22680000 | ICV\_IC-Verpleegkundig |
| **1** | 0 | 1994479 | 73 | Opdr. Laboratorium afname | 9270 | Bloedgas afnemen | 22680000 | ICV\_IC-Verpleegkundig |
| **2** | 0 | 1994480 | 73 | Opdr. Laboratorium afname | 9269 | Lab. CCH-VAT T = 0 | 22680000 | ICV\_IC-Verpleegkundig |
| **3** | 0 | 1994481 | 103 | Opdr. Radiologie | 7922 | X-Thorax | 22680000 | ICV\_IC-Verpleegkundig |
| **4** | 0 | 1994482 | 81 | Opdr. Circulatie | 7921 | ECG | 22680000 | ICV\_IC-Verpleegkundig |
| **5** | 0 | 1994566 | 73 | Opdr. Laboratorium afname | 9270 | Bloedgas afnemen | 27840000 | ICV\_IC-Verpleegkundig |
| **6** | 0 | 1994567 | 73 | Opdr. Laboratorium afname | 9267 | Lab. CCH-VAT T = 2 | 27840000 | ICV\_IC-Verpleegkundig |
| **7** | 0 | 1994603 | 111 | 1. Stoppen/Wijzigen | 9449 | Opdr.\Proc. Stoppen | 30900000 | ICV\_IC-Verpleegkundig |
| **8** | 0 | 1994707 | 73 | Opdr. Laboratorium afname | 9270 | Bloedgas afnemen | 40500000 | ICV\_IC-Verpleegkundig |
| **9** | 0 | 1994708 | 73 | Opdr. Laboratorium afname | 9268 | Lab. CCH-VAT T = 6 | 40500000 | ICV\_IC-Verpleegkundig |

## processitems

The processitems table contains all catheters, drains, tubes, and continous non-medication processes (e.g. renal replacement therapy, hypothermia induction, etc) that patients received during their stay on the ICU. All items have an associated admissionid from the admissions table.

### Fields

|  |  |  |
| --- | --- | --- |
| Name | Type | Description |
| admissionid | integer | links the item with the admissionid in the admissions table. |
| itemid | integer | id to identify the type of process. |
| item | string | name of the process. |
| start | integer | start time (time of introduction) of the process, in milliseconds since the first ICU admission. |
| stop | integer | stop time (time of removal) of the process, in milliseconds since the first ICU admission. |
| duration | integer | duration of the process, i.e. the difference between start and stop times, in minutes. |

### Example records

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **admissionid** | **itemid** | **item** | **start** | **stop** | **duration** |
| 0 | 0 | 9159 | Arterielijn Radialis | 20520000 | 148800000 | 2138 |
| 1 | 0 | 9166 | Trilumen Jugularis | 20520000 | 148800000 | 2138 |
| 2 | 0 | 9174 | Swan Ganz Jugularis | 20520000 | 139020000 | 1975 |
| 3 | 0 | 9328 | Beademen | 20520000 | 69120000 | 810 |
| 4 | 0 | 9399 | Wonddrain 1 | 20520000 | 94320000 | 1230 |
| 5 | 0 | 9400 | Wonddrain 2 | 20520000 | 142080000 | 2026 |
| 6 | 0 | 9403 | Thoraxdrain 1 | 20520000 | 148800000 | 2138 |
| 7 | 0 | 9415 | Urine-Catheter (CAD) | 20520000 | 148800000 | 2138 |
| 8 | 0 | 9417 | Sonde | 20520000 | 148800000 | 2138 |
| 9 | 0 | 9422 | Perifeer infuus | 20520000 | 148800000 | 2138 |

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