**Research Data Extraction Template**

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**Purpose:** Patients who develop sepsis while hospitalized have higher mortality than those who present from the community with sepsis, even after controlling for comorbidities. We suspect that this disparity may be related to differential effectiveness of the sepsis bundle in this population—either difficulties with its implementation or else decreased efficacy. The purpose of this study is to evaluate clinical factors associated with adherence to the sepsis bundle. Understanding the factors influencing use of the sepsis bundle will facilitate tailoring it to improve adherence. De-identified clinical data is desired from all five UC medical centers.

**Inclusion/Exclusion Criteria**

Encounter-level selection

1. Encounter type: hospitalization at any UC medical center.
2. Admission date between 10/01/2014 and 10/01/2016
3. Patient age: 18 or older **at time of admission**
4. Encounter contains ICD-9 or ICD-10 diagnosis codes for septicemia/sepsis + organ dysfunction   
   OR ICD-9 or ICD-10 diagnosis codes for severe sepsis or septic shock, without documentation of organ dysfunction, per the code lists below. **(Note**, these criteria are almost identical to the CMS Core Measure SEP-1, “Early Management Bundle, Severe Sepsis/Septic Shock.”)

*ICD-9 codes*

* Septicemia (038.0, 038.10, 038.11, 038.12, 038.19, 038.2, 038.3, 038.40, 038.41, 038.42, 038.43, 038.44, 038.49, 038.8, 038.9), SIRS (995.90), sepsis (995.91), bacteremia (790.7), other fungal infection (117.9), systemic candidiasis (112.5), candidal endocarditis (112.81), acute and subacute bacterial endocarditis (421.0), acute endocarditis (421.9), salmonella septicemia (003.1), septicemic plague (020.2), anthrax septicemia (022.3), meningococcal septicemia (036.2), Waterhouse-Friedrichson syndrome (036.3), herpetic septicemia (054.5), gonococcemia (098.89), sepsis due to indwelling urinary catheter (996.64), infection due to central venous catheter (999.31, 999.32)

+

Organ dysfunction:

*Diagnoses*

- respiratory (518.51, 518.81, 518.82, 518.84, 786.09, 799.1)

- cardiovascular (458.0, 458.21, 458.29, 458.8, 458.9, 785.50, 785.51, 785.59, 796.3)

- renal (584.5, 584.6, 584.7, 584.8, 584.9)

- hepatic (570, 572.2, 573.4)

- hematologic (286.6, 286.7, 286.9, 287.49, 287.5)

- metabolic (276.2)

- neurologic (293.0, 293.1, 293.9, 348.30, 348.31, 348.39, 357.82, 359.81, 780.09)

*Procedures*

- respiratory (93.90, 96.70, 96.71, 96.72, 31.1, 33.21, 33.22, 33.23, 33.24, 33.27, 31.29)

- cardiovascular (00.17, 88.72, 89.62, 89.64)

- renal (39.95)

- hematologic (99.04, 99.05, 99.06, 99.07)

- neurologic (89.14)

OR

* Severe sepsis (995.92), Septic shock (785.52) WITHOUT codes for organ dysfunction

*ICD-10 Codes*

* Sepsis: A02.1, A03.9, A04.7, A20.7, A21.7, A22.7, A23.9, A24.1, A26.7, A28.0, A28.2, A32.7, A39.2, A39.3, A39.4, A40.0, A40.1, A40.3, A40.8, A40.9, A41.01, A41.02, A41.1, A41.2, A41.3, A41.4, A41.50, A41.51, A41.52, A41.53, A41.59, A41.81, A41.89, A41.9, A42.7, A54.86, B00.7, B37.7, B95.4, B95.61, B95.620, J18.9, J44.0, N39.0

+

Organ dysfunction:

- respiratory (J80, J96.00, J96.01, J96.02, J96.90, J96.91, J96.92, R09.2)

- cardiovascular (R57.0, R57.1, R57.8, R57.9, I95.1, I95.9)

- renal (N17.0, N17.1, N17.2, N17.8, N17.9)

- hepatic (K72.0, K72.9, K76.3)

- neurological (F05, F05.9, G93.1, G93.40, G93.41)

- hematologic (D69.5, D69.6, D65)

- procedures (0BH13EZ, 0BH17EZ, 0BH18EZ)

OR

* Severe sepsis without septic shock (R65.20), Severe sepsis with septic shock (R65.21)

**Data Elements**

Data from eligible admissions represented in multiple tables, with observations linked among tables by a patient study ID and an encounter ID. These linking IDs are implied in each table below.

**Patient Demographics** (one row per patient)

|  |  |
| --- | --- |
| Variable | Describe values to include |
| **Patient StudyID1** | **Replace MRN with a serial number** |
| Gender |  |
| Race |  |
| Ethnicity |  |
| 1st Admission year |  |

1 Study ID is a study-specific unique research identifier assigned to each included patient. The StudyID is used implicitly in each table below to represent the patient identity.

**Encounters** (hospitalizations, including associated ED stays)

|  |  |  |
| --- | --- | --- |
| Variable | | Indicate or describe values to include |
| Patient StudyID |  | |
| Encounter ID | Preferably encrypt or replace CSN with a serial number | |
| Epic Encounter Type1 | Hospital admission (pull only admissions that meet inclusion criteria) | |
| Days since 1st admission | If more than one qualifying admission, use pt’s first admission as day 0 | |
| Encounter Age | Age at admission (set to 90 if >89) | |
| LOS in decimal days | (Discharge minus admit time, in days) | |
| Hospital Discharge Disposition | e.g. home, facility, death, etc. | |
| ED Disposition |  | |
| Admitting Provider Type, Specialty |  | |
| Location or Facility Name | e.g. Moffitt, Mt. Zion, etc. | |
| Admission source | (i.e., home, residential care, skilled nursing facility) | |

Footnotes:

1 Values as recorded in Epic.

**ADT Information** (Within-hospital patient movement events)

|  |  |  |  |
| --- | --- | --- | --- |
| Variable | | Selection Criteria | |
| Encounter ID | | |  | |
| ADT Event Type1 | e.g. Admit, Transfer, Discharge | | |
| ADT Event Time | To avoid use of dates, report as hours from admission for this encounter | | |
| Receiving Department Name/ID | Use Epic department name | | |
| ICU flag | “Yes” if receiving department is an ICU | | |
| Department Specialty |  | | |

**Diagnoses**

|  |  |  |
| --- | --- | --- |
| Variable | Selection Criteria | |
| Encounter ID | |  | |
| Diagnosis Source1 | Hospital encounter diagnoses only (not problem list) | |
| Diagnosis Time | Expressed in hours from start of encounter | |
| ICD-9 Code |  | |
| ICD-9 Description |  | |
| ICD-10 Code2 |  | |
| ICD-10 Description |  | |
| Primary/Secondary Flag |  | |
| POA Flag |  | |
| Final Diagnosis Flag |  | |
| Admit Diagnosis Flag |  | |

**Procedures Completed** (per billing data)

|  |  |  |
| --- | --- | --- |
| Variable | Selection Criteria | |
| Encounter ID | |  | |
| Procedure Time | Expressed in hours from start of encounter | |
| ICD-9 PX Code | (OK to omit E&M and other CPTs) | |
| ICD-9 PX Description |  | |
| ICD-10 PX Code |  | |
| ICD-10 PX Description |  | |

**Vital Signs (from Flowsheet)**

|  |  |  |
| --- | --- | --- |
| Variable | Selection Criteria | |
| Encounter ID | |  |
| Vital Sign Taken Time | Expressed as hours from start of encounter | |
| Vital Sign Type | Include all values of: BMI, Weight, Blood Pressure, Heart rate, Temperature, Respiratory rate | |
| Vital Sign Value |  | |

**Laboratory Test Results**

|  |  |  |
| --- | --- | --- |
| Variable | Selection Criteria | |
| Encounter ID | |  |
| Component ID |  | |
| Component Name | Only need components matching: WBC count, hemoglobin, platelets, creatinine, total bilirubin, PTT, INR, lactate, procalcitonin\*; ***Each site should generate a component list for investigator to choose from***. | |
| Specimen Time | Expressed as hours from start of encounter | |
| Order Time | Expressed as hours from start of encounter | |
| Result Time |  | |
| Result Value |  | |
| Units |  | |
| Reference range |  | |

\*Please provide the name and value counts for each lab component so the investigator can choose which ones represent the tests of interest.

**Medication Orders and Administrations**

|  |  |  |
| --- | --- | --- |
| Variable | Selection Criteria | |
| Encounter ID | |  |
| Order Med ID | Any medication from list at end of document ***(what did Javi use?) I generated a med list for the PI to choose from*** | |
| Pharm Class |  | |
| Pharm Subclass |  | |
| Order Time | Expressed as hours from start of encounter | |
| Start Time | Expressed as hours from start of encounter | |
| End Time | Expressed as hours from start of encounter | |
| Administered Time | Expressed as hours from start of encounter | |
| Epic Medication Name | Only need meds listed on last page | |
| MediSpan Generic Name |  | |
| MediSpan Class Name |  | |
| Dose Instructions |  | |

**Allergies**

|  |  |  |
| --- | --- | --- |
| Variable | Selection Criteria | |
| Patient StudyID | |  | |
| Allergen | Medication allergies only | |
| Description |  | |
| Reaction |  | |
| Allergy Status |  | |
| Severity |  | |

**Culture Isolates (Microbiology)**

|  |  |  |
| --- | --- | --- |
| Variable | Selection Criteria / Comments | |
| Encounter ID | |  | |
| Order Procedure Id |  | |
| Order Time | Expressed as time from admission | |
| Specimen Source |  | |
| Specimen Type |  | |
| Line Number | Some result wrap onto a second line | |
| Result |  | |
| Component |  | |
| Component Comment |  | |
| Organism Name |  | |
| Line Comment |  | |
| Results Comment |  | |

**Antimicrobial Susceptibility (Microbiology)**

Each row in this table should relate to one organism in the table above (m:1).

|  |  |
| --- | --- |
| Variable | Comments |
| Order Procedure Id | This field should link to the culture order in the table above |
| Organism Name |  |
| Susceptibility |  |
| Sensitivity |  |
| Antibiotic |  |

**Medication List**

*1. Antimicrobials:*

- amikacin

- amoxicillin

- amoxicillin/clavulanate  
- amphotericin

- ampicillin

- ampicillin/sulbactam

- anidulafungin

- azithromycin

- aztreonam

- caspofungin

- cefadroxil

- cefazolin

- cefepime

- cefotaxime

- cefoxitin

- cefpodoxime

- ceftazidime

- ceftazidime/avibactam

- ceftolozane/tazobactam

- ceftriaxone

- cefuroxime

- cephalexin

- ciprofloxacin

- clarithromycin

- clindamycin

- colistimethate

- cotrimoxazole

- daptomycin

- doripenem

- dicloxacillin

- doxycycline

- ertapenem

- erythromycin

- fidaxomicin

- fosfomycin

- fluconazole

- flucytosine

- gentamicin

- imipenem/cilastatin

- isavuconazonium

- itraconazole

- ketoconazole

- levofloxacin

- linezolid

- meropenem

- metronidazole

- micafungin

- minocycline

- moxifloxacin

- nafcillin

- nitrofurantoin

- oxacillin

- oritavancin

- penicillin

- piperacillin/tazobactam

- polymyxin

- posaconazole

- rifampin

- streptomycin

- tedizolid

- tetracycline

- tigecycline

- tobramycin

- trimethoprim

- sulfamethoxazole

- vancomycin

- voriconazole

*2. Immunosuppressants and chemotherapy:*

- abatacept

- abciximab

- adalimumab

- anakinra

- anti-thymocyte globulin

- alemtuxumab

- axitinib

- azacitidine

- azathioprine

- basiliximab

- belatacept

- belimumab

- belinostat

- bendamustine

- bevacizumab

- bleomycin

- blinatumumab

- bortezomib

- busulfan

- capecitabine

- carboplatin

- carfilzomib

- carmustine

- certolizumab

- cetuximab

- cisplatin

- clofarabine

- crizotinib

- cyclophosphamide

- cycloserine

- cyclosporine

- cytarabine

- dabrafenib

- dacarbazine

- dactinomycin

- dasatinib

- daunorubicin

- decitabine

- dexamethasone

- doxorubicin

- eculizumab

- eribulin

- erlotinib

- etanercept

- etoposide

- everolimus

- fludrocortisone

- fluorouracil or 5FC

- gemcitabine

- hydrocortisone

- ibritumomab

- ibrutinib

- idarubicin

- idelalisib

- ifosfamide

- imatinib

- infliximab

- ipilimumab

- irinotecan

- lenalidomide

- melphalan

- mercaptopurine

- methotrexate

- methylprednisolone

- mitomycin

- mitoxantrone

- mycophenolate

- obinutuzumab

- ofatumumab

- olaparib

- osimertinib

- oxaliplatin

- nelarabine

- nilotinib

- palbociclib

- paclitaxel

- panitumumab

- pazopanib

- pegaspargase

- pembrolizumab

- pemetrexed

- pomalidomide

- ponatinib

- pralatrexate

- prednisolone

- prednisone

- regorafenib

- rituximab

- ruxolitinib

- sirolimus

- sorafenib

- sunitinib

- tacrolimus

- temozolomide

- tocilizumab

- tofacitinib

- topotecan

- trastuzumab

- trametinib

- vedolizumab

- vemurafenib

- vinblastine

- vincristine

- vinorelbine

- volasertib

*3. Crystalloid:*

- normal saline

- 0.45% or 0.9% NaCl solution

- sodium chloride IV solution

- lactated ringers

*4. Vasopressors:*

- dopamine

- epinephrine

- midodrine

- norepinephrine

- vasopressin