Supplement 2. Operational definitions of candidate risk factors for CLABSI in the pediatric intensive care unit

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| **Metric** | **Definition** |
| Acute behavioral health needs | 1. Behavioral health consults that were ordered within 90 days of the CLABSI date or end date. Consults included: consult to psychiatry, consult to psychology, consult to behavioral health.OR2. The following medications administered or ordered "PRN agitation" in the days prior (day 0,1,2, or 3) to the CLABSI date or end date: risperidone, olanzapine, haloperidol, quetiapine. |
| Blood products (all) | Any of the following blood products given on days 0,1,2,3 before the CLABSI date or end date:Transfusion order: Platelets, Transfusion order: Packed Red Blood Cells, Transfusion order: O Negative PRBCs, Transfusion order: Fresh Frozen plasma, Transfusion order: Cryoprecipitate. |
| Packed red blood cell transfusion  | Transfusion order for packed red blood cells or O-negative packed red blood cells on days 0,1,2,3 before the CLABSI date or end date  |
| Compromised skin integrity  | Braden Q score^ (skin integrity test) of <= 16; from documented scores on day 0,1,2, or 3 before the CLABSI date or end date. |
| Complex chronic conditions | Presence of ICD-9 or ICD-10 code for the following complex and chronic conditions: cardiovascular disease, gastrointestinal illness, renal disease, respiratory disease, congenital anomalies, hematologic/immunologic disease, malignancy, metabolic/endocrine disease, neuromuscular disease |
| Graft Vs Host disease (GVHD) | Any mention of "GVHD" from a patient's problem list |
| History of CLABSI | Patient met NHSN criteria for CLABSI prior to either their current CLABSI date or end date  |
| International medicine patient | Patient's provider is listed as either 'International Patient Services, Provider' Or 'Provider, Global Patient Svcs' |
| Interpreter services needed | Yes, no, or missing; from patient record in electronic medical record  |
| Race | African American, White, or Other (“Other” includes multiple races, missing data, any race that is not "African American," and any race that is not “White." This classification is based on the study site’s Ethics committee definition.) |
| Ethnicity  | Hispanic vs Non-Hispanic(Non-Hispanic includes non-Hispanics and missing data. This classification is based on the study site’s Ethics committee definition.) |
| Sex | Male or Female  |
| Language | English, Non-English, or Other (Non-English is any language noted as the primary language other than English) |
| Duration of central venous catheter placement  | Time in days from line placement date until either 1) CLABSI infection date or 2) control's randomly selected end date |
| Location of central venous catheter  | 1) arm (accessory cephalic, antecubital, axillary, basilic, brachial, cephalic, median basilic, median cephalic, median cubital basilic, median cubital cephalic vein); 2) cardiac (atrial); 3) subclavian (chest, subclavian); 4) femoral; 5) head (temporal posterior auricular); 6) leg (saphenous); 7) jugular; 8) umbilicus |
| Type of central venous catheter | Temporary central venous line, Broviac, peripherally inserted central catheter (PICC), PORT, and Other (“Other” includes Apheresis, umbilical arterial catheter, umbilical venous catheter, central venous catheter other)  |
| Invasive mechanical ventilation  | Documentation from respiratory flowsheets on days 0,1,2, or 3 before CLABSI date or end date of "Ventilation ~ Invasive": via endotracheal tube or tracheostomy |
| Non-invasive mechanical ventilation | Any documentation in Respiratory Flowsheet on days 0,1,2, or 3 before CLABSI date or end date of "Ventilation ~ Non-Invasive": CPAP (continuous positive airway pressure) and/or BiPAP (bi-level positive airway pressure). If a patient had both non-invasive and invasive ventilation in those days, the patient was flagged as invasive rather than non-invasive ventilation  |
| Number of central venous catheter accesses  | Cumulative documented accesses (entries) into central venous catheter from days 0, 1, and 2 before CLABSI date or end date. Central venous catheter access is defined as any line entry into a closed system, in accordance with CHOP institutional policy. Total number access is the total number of accesses over that 3 day period. Access category stratifies total number of accesses into 0-30, 31-79, 80+, or “missing: categories. The “missing” category is used if a patient does not have complete data for all three days. |
| Number of central venous catheters in place | Number of central venous catheters present on day of CLABSI or end date  |
| Presence of ostomy | Any ostomy present on days 0,1,2, or 3 before CLABSI date or end date |
| History of prematurity | Any inclusion of "prematurity" in patient's problem list  |
| Diagnosis of short gut syndrome  | Any mention of "short gut", "short bowel", or "intestinal failure" in patient's problem list; or patient inclusion on institution’s short gut patient registry |
| Tissue plasminogen activator (TPA) administration  | Includes any administered alteplase with an administration route of injection or bolus on days 0,1,2, or 3 before CLABSI date or end date. Excluded any medications that were ordered for acute stroke or administered as an infusion. Excluded volume > 1.0mg. |
| Total parenteral nutrition (TPN) administration  | Any medication administered on day 0,1,2, or 3 before the CLABSI date or end date that has "TPN" or "parenteral nutrition" in the order name |
| Presence of tracheostomy | Tracheostomy tube in place at some point during days 0, 1, 2, or 3 before the CLABSI date or end date |
| Administration of vasoactive medications  | Includes any of the following drugs administered on days 0,1,2, or 3 before CLABSI date or end date: DOPAMINE, EPINEPHRINE, NOREPINEPHRINE, DOBUTAMINE, VASOPRESSIN, MILRINONE, ISOPROTERENOL,PHENYLEPHRINE. Administration route was limited to intravenous only.  |
| Neutropenia | Any ANC value <= 500 on days 0,1,2,or 3 prior to CLABSI date or end date |

^The Braden QD Scale reliably predicts both immobility-related and device-related pressure injuries in the pediatric acute care environment and here serves as a marker for skin integrity. [Curley MAQ](https://proxy.library.upenn.edu:2065/pubmed/?term=Curley%20MAQ%5BAuthor%5D&cauthor=true&cauthor_uid=29246340), [Hasbani NR](https://proxy.library.upenn.edu:2065/pubmed/?term=Hasbani%20NR%5BAuthor%5D&cauthor=true&cauthor_uid=29246340), [Quigley SM](https://proxy.library.upenn.edu:2065/pubmed/?term=Quigley%20SM%5BAuthor%5D&cauthor=true&cauthor_uid=29246340), et al. Predicting Pressure Injury Risk in Pediatric Patients: The Braden QD Scale. [J Pediatr.](https://proxy.library.upenn.edu:2065/pubmed/29246340) 2018 Jan;192:189-195.e2. doi: 10.1016/j.jpeds.2017.09.045.