

Central Line Surveillance

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Why are we doing this?



- SB 1058 "Nile's law"
- Consumer Driven
- 1288.55. (a).(2) Each health facility shall report quarterly to the department all central line associated bloodstream infections and the total central line days.
- (2) For purposes of reporting, as required in subdivisions (a) and (b), an infection shall be reported using the NHSN definitions...

Bloodstream infections are usually serious infections increasing LOS , Costs and Mortality

- An estimated 248,000 bloodstream infections occur in U.S. hospitals each year.
- It is believed that a large proportion of these are associated with the presence of a central vascular catheter...
- For the purposes of NHSN, such infections are termed central line-associated bloodstream infections (CLABSI).



The National Healthcare Safety Network (NHSN) Manual

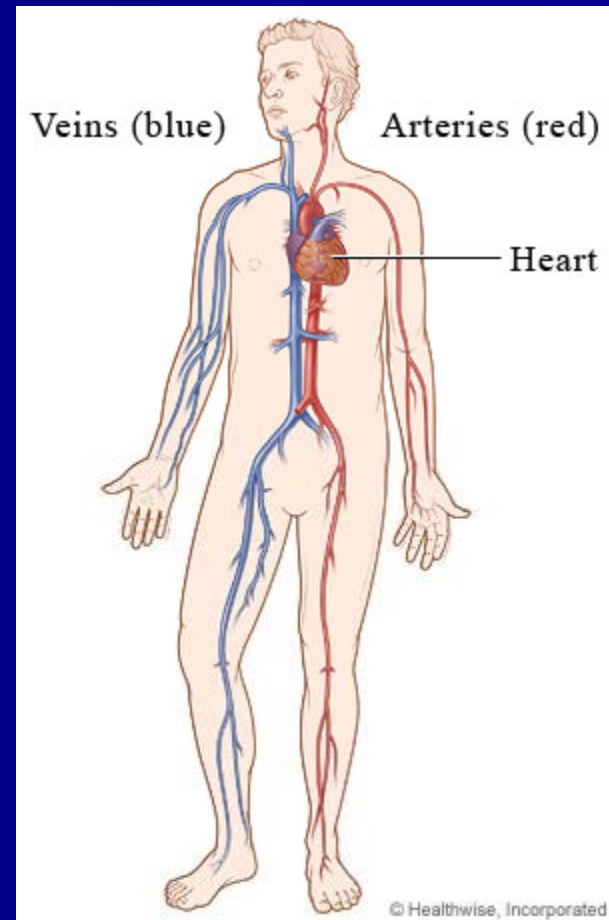
PATIENT SAFETY COMPONENT PROTOCOL

What is a Central Line?

- Central line: An intravascular catheter that terminates at or close to the heart or in one of the great vessels which is used for infusion, withdrawal of blood, or hemodynamic monitoring.
- A central line is not
 - Pacemaker wires and other non-lumened devices.

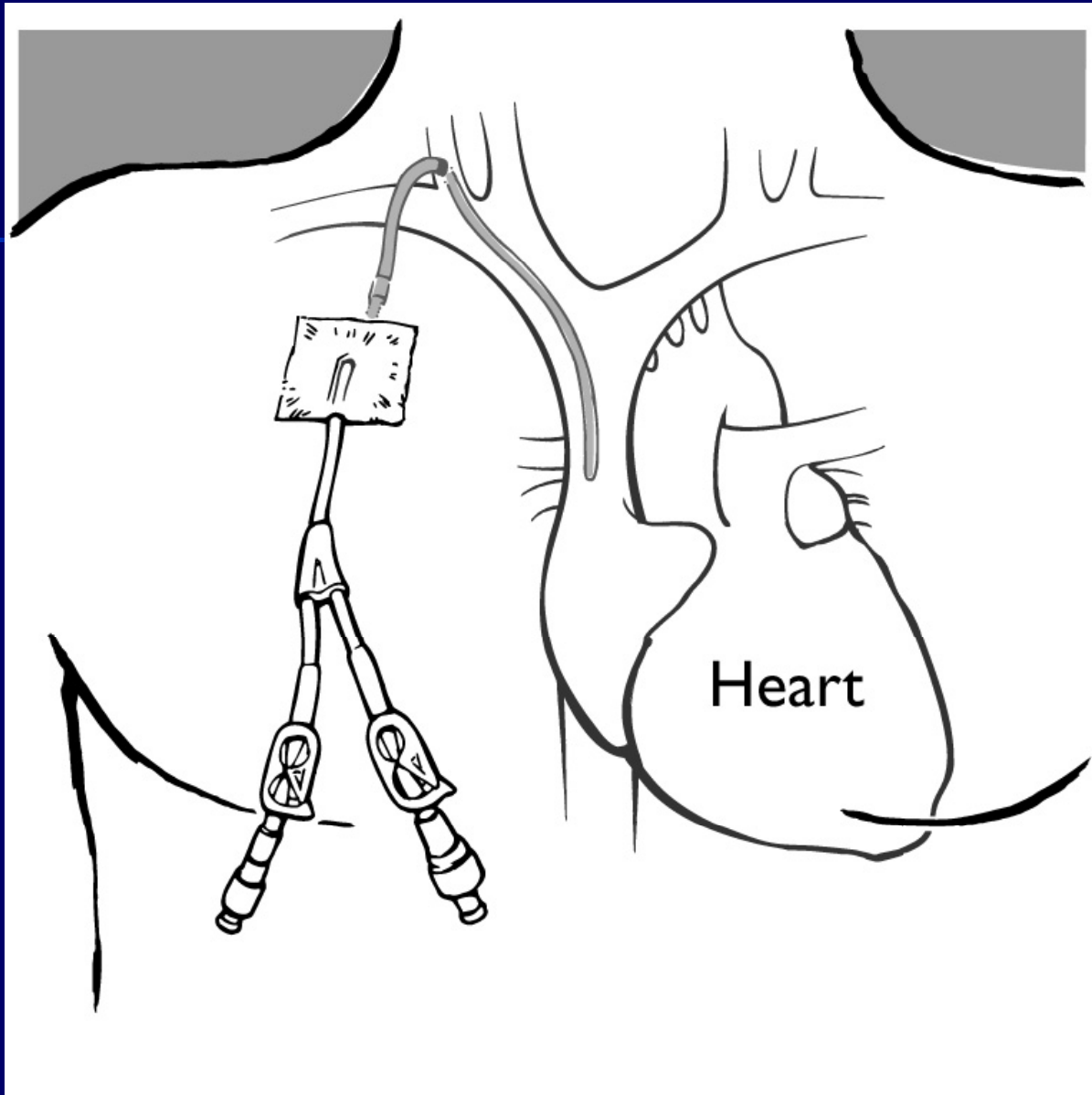
What are the Great Vessels?

- Aorta,
- Pulmonary artery
- Superior vena cava,
- Inferior vena cava,
- Brachiocephalic veins,
- Internal jugular veins,
- Subclavian veins,
- External iliac veins
- Common femoral veins,
- And in neonates, the umbilical artery/vein.



Temporary vs. Permanent

- Temporary central line: A non-tunneled catheter.
 - These catheters are placed via a relatively larger vein such as the jugular vein in the neck or femoral vein in the groin
- Permanent central line:
 - Tunneled catheters, including certain dialysis catheters
 - Implanted catheters (including ports)
 - These usually require fluoroscopy. A subcutaneous tunnel is created. Using x-ray guidance, the catheter is placed through the tunnel into the superior vena cava



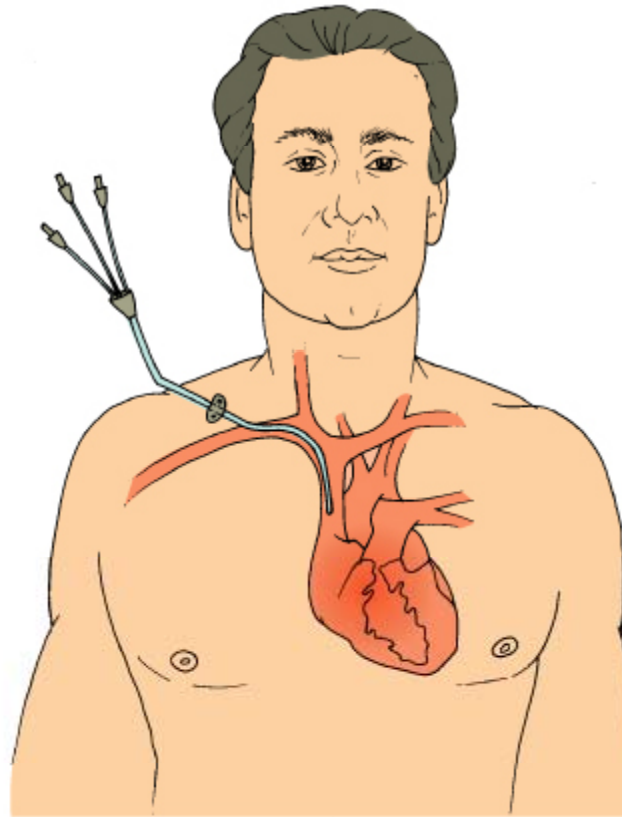
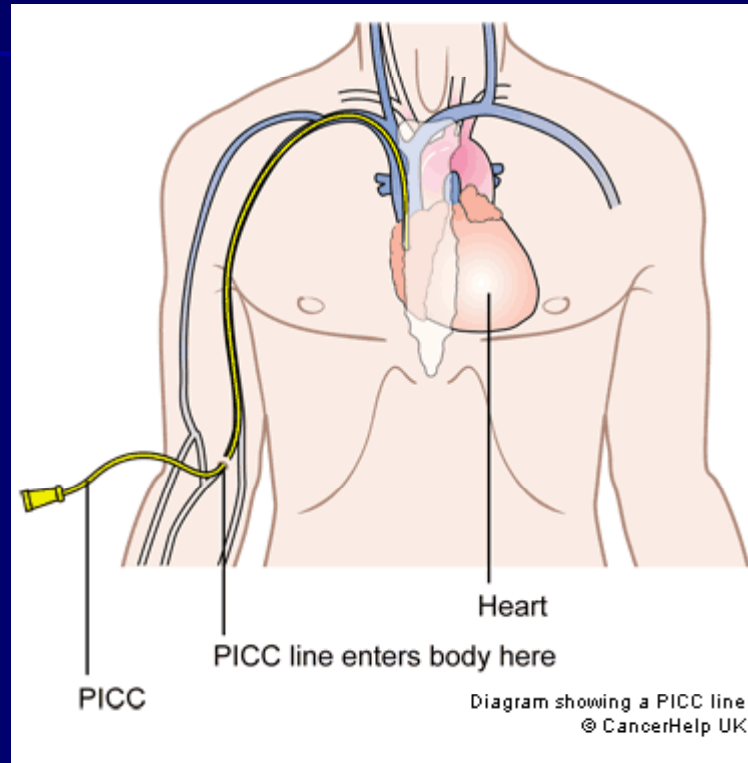


Figure 46-10 Placement of triple-lumen nontunneled percutaneous central venous catheter.



Some Central Catheter Synonyms

- TLC
- CVC
- Groshong
- Swan
- Cordis
- PICC
- Broviac (t)
- Hickman (t)
- PAC(t)
- Port a cath(t)
- Quinton
- Perm a cath
- Vascath
- Tesio

Central Line Associated Blood Stream Infections (CLABSI): Definitions

- NHSN definition for Infection
 - Localized or systemic condition resulting from an adverse reaction to the presence of an infectious agent(s) or its toxin(s).
 - no evidence that the infection was present or incubating at the time of admission to the care setting..

CLABSI: Criterion 1

- The patient has a recognized pathogen cultured from one or more blood cultures and the organism cultured from the blood is not related to an infection at another site
- The phrase “one or more blood cultures” means that at least one bottle from a blood draw is reported by the laboratory as having grown organisms (i.e., is a positive blood culture).
- The term “recognized pathogen” does not include organisms considered common skin contaminants

CLABSI: Criterion 2

- Patient has at least one of the following signs or symptoms
 - Fever ($>38^{\circ}$ C)
 - Chills
 - Hypotension
- Signs and symptoms and positive laboratory results are not related to an infection at another site
- common skin contaminant is cultured from two or more blood cultures drawn on separate occasions.
 - Separate occasions means that blood from at least two blood draws were collected within two days of each other.

Late Breaking News on Criterion 2 & 3

- There is no longer a requirement that antibiograms, if available, for common skin contaminants must match
- The isolate(s) must only match at the genus/species level for the bloodstream infection to be considered secondary to the primary infection site.

CLABSI: Criterion 3

- Patient < 1 year old has at least one of the following signs or symptoms
 - Fever ($>38^{\circ}$ C core)
 - Hypothermia ($< 36^{\circ}$ C core)
 - Chills
 - Hypotension
- Signs and symptoms and positive laboratory results are not related to an infection at another site
- common skin contaminant is cultured from two or more blood cultures drawn on separate occasions.
 - Separate occasions means that blood from at least two blood draws were collected within two days of each other.

Clinical sepsis (CSEP):

- Must meet the following criterion:
 - Patient < 1 year of age has at least one of the following clinical signs or symptoms with no other recognized cause: fever ($>38^{\circ}\text{C}$ core), hypothermia ($<36^{\circ}\text{C}$, core), apnea, or bradycardia
 - blood culture not done or no organisms detected in blood
 - no apparent infection at another site
 - physician institutes treatment for sepsis.

Reporting a CLABSI

- Primary bloodstream infections (BSI) are classified according to the criteria used, either as laboratory-confirmed bloodstream infection (LCBI) or clinical sepsis (CSEP). CSEP may be used to report only primary BSI in neonates (≤ 30 days old) and infants (≤ 1 year old).
- Report BSIs that are central line-associated (i.e., a central line or umbilical catheter was in place at the time of, or within 48 hours before, onset of the event).

NOTE:

- There is no minimum period of time that the central line must be in place in order for the BSI to be considered central line-associated

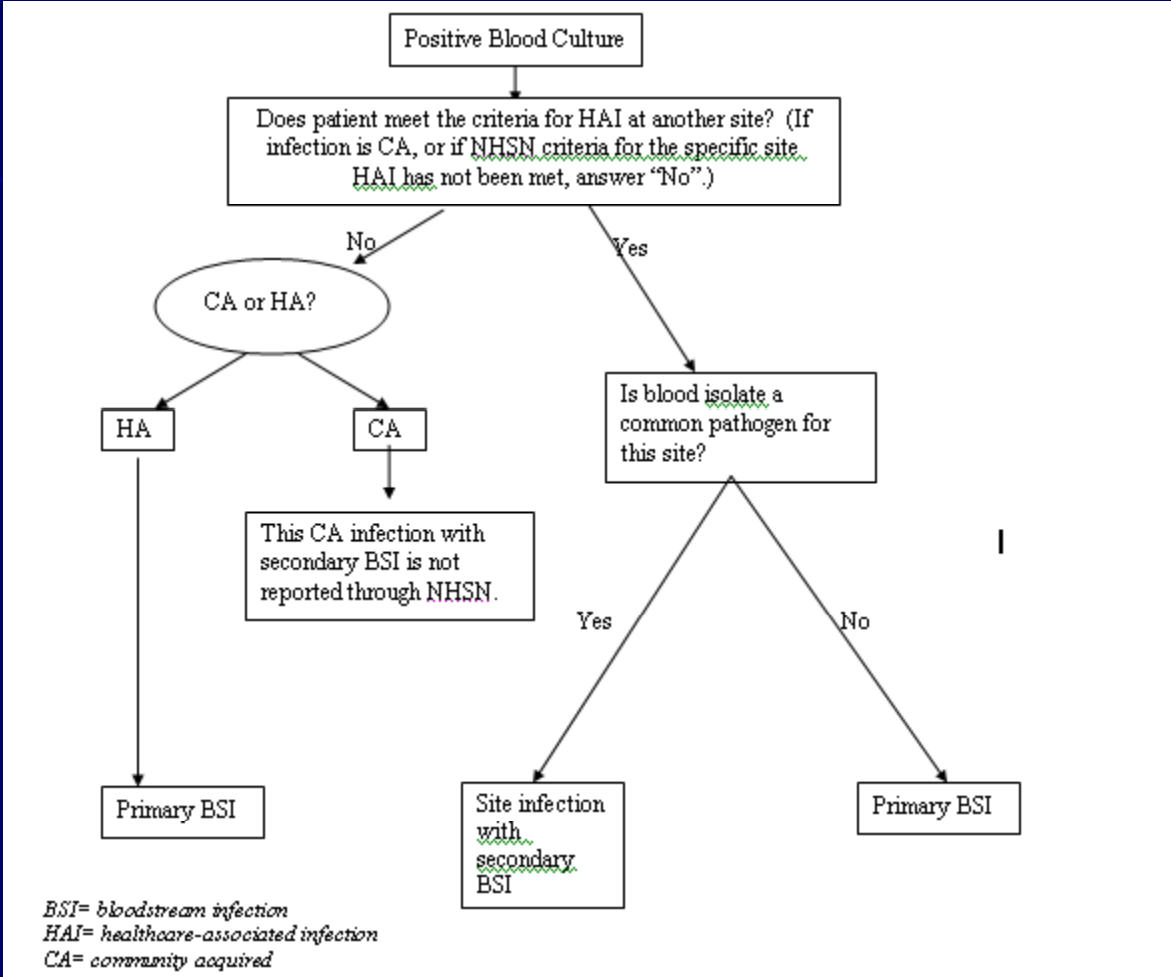


What is the meaning of the statement “not related to infection at another site” in relation to a positive blood culture?

- The goal of NHSN infection site criteria is to identify and consistently categorize infections that are healthcare-associated into major and specific infection sites or types. Several of the criteria include the caveat that signs, symptoms, and laboratory findings may not be related to infection at another site. When assessing positive blood cultures in particular, one must be sure that there is no other primary source of HAI that may have seeded the bloodstream secondarily, otherwise the infection may be misclassified as a primary BSI or erroneously associated with the use of a central line.

What is the meaning of the statement “not related to infection at another site” in relation to a positive blood culture? (continued)

- If the NHSN criteria for the remote infection require a culture, then the organism(s) cultured from that site must match the organism(s) in the blood culture.
- In instances where a culture of the involved site is not required for NHSN criteria, and no such culture is collected, it may be necessary to use clinical judgment regarding the likelihood of it causing a secondary blood stream infection (BSI). In these instances, the following guidance may be used to help determine the relatedness of remote sources of infection to a positive blood culture



1

Late breaking News On Primary Vs Secondary

- When determining if a bloodstream infection is the primary infection site or secondary to an infection at another site, there will be no requirement for the antibiograms of the blood culture isolate(s) and antiobgrams of the isolate(s) from the primary infection site culture to match.
- The isolate(s) must only match at the genus/species level for the bloodstream infection to be considered secondary to the primary infection site.

Other Possible Definition

- Gastrointestinal tract infections, excluding gastroenteritis and appendicitis, must meet at least 1 of the following criteria:
- Patient has an abscess or other evidence of infection seen during a surgical operation or histopathologic examination.
- Patient has at least 2 of the following signs or symptoms with no other recognized cause and compatible with infection of the organ or tissue involved: fever ($>38^{\circ}\text{C}$), nausea, vomiting, abdominal pain, or tenderness

GIT continued:

- and at least 1 of the following:
- a. organisms cultured from drainage or tissue obtained during a surgical operation or endoscopy or from a surgically placed drain
- b. organisms seen on Gram's or KOH stain or multinucleated giant cells seen on microscopic examination of drainage or tissue obtained during a surgical operation or endoscopy or from a surgically placed drain
- c. organisms cultured from blood
- d. evidence of pathologic findings on radiographic examination
- e. evidence of pathologic findings on endoscopic examination (eg, Candida esophagitis or proctitis).

Location, Location, Location

- Unit of attribution
 - Wherever the blood culture was drawn
 - Or where signs or symptoms first started
- Transfer Rule: If a CLABSI develops within 48 hours of transfer from one inpatient location to another in the same facility, the infection is attributed to the transferring location.
- 80% rule: Location code is determined by the type of patients cared for in that area. That is, if 80% of patients are of a certain type (e.g., pediatric patients with orthopedic problems) then that area is designated as that type of location

Settings: ICU

- Burn
- Medical Cardiac
- Surgical Cardiothoracic.
- Medical
- Medical/Surgical
- Neurologic
- Neurosurgical diseases.
- Prenatal Critical Care
- Respiratory
- Surgical
- Trauma

Settings : Neonatal

- Inpatient Well Baby Nursery (Level I)
- Step down Neonatal ICU (Level II)
- Neonatal Critical Care (Level II/III)
Combined nursery housing both Level II and III newborns and infants
- Neonatal Critical Care (Level III)

Settings: Pediatric Critical Care

- Pediatric Burn Critical Care
- Pediatric Cardiothoracic Critical Care
- Pediatric Medical Critical Care (PICU in NNIS)
- Pediatric Medical/Surgical Critical Care
- Pediatric Neurosurgical Critical Care
- Pediatric Respiratory Critical Care
- Pediatric Surgical Critical Care

Settings: Step Down Units

- Step down unit (post Critical Care)
- Step down Pediatric ICU

Settings: Specialty Care Areas (SCA)

11 different
Adult and
Pediatric
SCAS

- Examples
- Bone Marrow Transplant SCA
- Pediatric Dialysis SCA
- Long Term Acute Care (LTAC)
- Solid Organ Transplant SCA
- Pediatric Trauma Critical Care

Settings: Inpatient Adult Wards

25 different areas

- Examples
- Inpatient Plastic Surgery Ward
- Inpatient Rehabilitation Ward.
- Acute Stroke Unit
- Inpatient Ear/Nose/Throat Ward
- Inpatient School Infirmary
- Inpatient Jail Unit
- Inpatient Behavioral Health/Psych Ward

Settings: Inpatient Pediatric Wards

12 different
Inpatient
Pediatric
areas

- Examples:
- Inpatient Pediatric Neurology Ward
- Inpatient Pediatric Orthopedic Ward
- Inpatient Pediatric Rehabilitation Ward
- Inpatient Pediatric Behavioral Health
- Inpatient Pediatric Ear, Nose, Throat

Designations and SIRS

- In HAI data analysis, the SIR compares the actual number of HAIs reported with the baseline U.S. experience (i.e., NHSN aggregate data are used as the standard population), adjusting for several risk factors that have been found to be significantly associated with differences in infection incidence.

To SIR with Love

- The SIRS use 2006-2008 as the baseline period, and therefore, SIRs are calculated for 2009 and forward.
- To allow for more precise comparisons, SIRs are calculated only if the number of expected HAIs (numExp) is ≥ 1 .

$$\text{SIR} = \frac{\text{Observed (O) HAIs}}{\text{Expected (E) HAIs}}$$

In other words, an SIR greater than 1.0 indicates that more HAIs were observed than predicted, accounting for differences in the types of patients followed; conversely, an SIR less than 1.0 indicates that fewer HAIs were observed than predicted.

CLABSI SIRs instead of CLABSI rates?

- The CLABSI SIR allows you to summarize your data by more than a single location, adjusting for differences in the incidence of infection among the location types. For example, you will be able to obtain one CLABSI SIR adjusting for all locations reported. Similarly, you can obtain one CLABSI SIR for all specialty care areas in your facility.
- Additionally, the CLABSI SIR may be an easier measure to discuss among internal and external stakeholders.
- Location-specific CLABSI rates will continue to be a useful tool in your prevention efforts. CLABSI rates will provide the information needed to identify granular, temporal changes in CLABSI occurrence and device utilization.

Denominator Data

- CLABSI requires collecting device days
- Device day denominator data that are collected differ according to the location of the patients being monitored.

Denominator Collection Differences

- ICUS and other areas apart from SCAS and NICU
 - Number of patients with one or more central lines.
 - Collect at the same time each day
 - Collect Daily

SCA Denominator Collection

- Broken into two groups: those with permanent central lines and temporary central lines
- Patients with both should be counted as a temporary line day
- Collect daily at the same time.

NICU Denominator Days

- 5 birth weight categories
 - < 750gm,
 - 751-1000gm
 - 1001-1500 gm
 - 1501-2500 gm
 - > 2500 gm
- Each Birth weight is again broken into 2 groups, those with central lines and those with umbilical catheters
- Those with both should be counted as an umbilical catheter day only
- Collect daily at the same time.
- Note: if reporting a CLABSI in a NICU, do not report in category range of the infant's current weight but rather the infant's weight at birth.

04/24/09

<p>IVF. PCA Dilaudid 0.5 q30 bolus HOB elevated Mentally delayed 24hr Cr Cr, re-started, spilled Ptt < 20 _____ Hgb < 8.5 _____ Hct < 25 _____ Cr _____ WBC _____</p>	<p>PICC</p> <p>BMT Workup for MUD: All done</p> <p>PO: PO: acyclovir IV: micafungin, decadron Abx: Days 1 Nights 0</p>	<p>28 years relapsed AML Facial and neck swelling s/p Mylotarg Radiation Oncology consult s/p radiation done 04/17 to mediastinum resolving SVC syndrome</p>
<p>TPN (60 units RI) headache= q1500 PRN q 3hrs nausea=ativan PRN mouth/throat redness afebrile Check pit. BIL (hx nose bleed) Ptt < 50 _____ ACCU-CHECK BID Hgb < 9.0 _____ Hct _____ cr _____ WBC _____</p>	<p>PICC</p> <p>PO: Lvgp IV: Micafungin, ACV, Vanco, Imipenem Abx Days 4 Nights 4 abelcet</p>	<p>27 years AML admit for chemo s/p flag</p>

Device Counts

State regulation now requires the reporting of certain infection rates using device days as a denominator

DATE: 4-24-09

UNIT A

NAME	Implanted VAD (e.g. Hickman, PAC)	Other VAD (e.g. PICC, Quinton)	PIV	Foley
8520				
8521		PICC		
8522		PICC		
8524				
8525		PICC		
8526				

CLABSI or Not?

- 40 year old male with ALL . HSCT
Day 4 with a PICC. Currently on the
5th floor
 - T 39.5⁰
 - Blood Cultures + for E. coli
 - Chart review reveals patient was
transferred from the 4th floor the day
before the culture was obtained.

CLABSI or Not?

- 2 year old Female , NEC survivor, Short Gut syndrome, TPN dependant. Hickman catheter in place.
- Febrile 38.2⁰ C
- S. epidermidis recovered from one set of blood cultures.
- MD orders vancomycin x 10 days

CLABSI or Not?

- 54 year old female with AMI admitted from ER to CCU unit at 1900 hours. 2 large bore PIVs and Hemodynamic catheter via IJ cordis in place.
- Chills, Blood pressure drops to 80/40.
- Fluids and pressors started.
- Blood Cultures 0200 and 0220 hours both positive *S. viridians*

CLABSI or Not?

- 46 year old Diabetic male with End stage renal disease with Quinton catheter in place admitted for diabetic foot ulcer on Monday. PIV placed on admission.
- Wednesday Dialyzed , that night develops fever and rigors. Blood culture positive for MRSA.



Any Questions?

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