Positive Blood Culture Review

Version 7: 6/30/08

Name: _____ MR #: _____ DOB:__/__/__ Birth WT:_____ GA_____wk EGA at dx:____wk
Final Dx: [ ] CABSI [ ] BSI [ ] NEC [ ] VAP [ ] Contaminant [ ] Other:_____

Clinical Findings at Time Blood Culture Drawn and Blood Culture Collection Data	
Risk Factors: [ ] Immunocompromised [ ] Compromised skin integrity [ ] Open body cavity [ ] Ostomy present [ ] Surgical site infection receiving Rx [ ] Other risk factors: (state)	[ ] Blood transfusion in last 72 hours [ ] NCPAP/Nasal cannula [ ] Feeding tube Enteral nutrition volume/parenteral volume ratio: _____ (approximate) [ ] Vascular Catheter [ ] Major surgery within past week [ ] or any other time Specify type of surgery:
Catheter Information: **Only relevant if line(s) present within the 48 hr prior to first blood culture**	
[ ] None [ ] PIV ____# days (if multiple site, note only longest) Estimate # IV start attempts in last 72 hrs:_____ [ ] UAC_____# days [ ] UVC_____# days [ ] PICC_____# days Site: _____ [ ] Other CENTRAL line _____# days Site: _____ _____Estimate total # times all lines accessed during the **last 72 hours** (including for meds/blood draws/ tubing changes, etc) Last date dressing changed: ___/___/___	[Y/N] Antibacterial patch in use [Y/N] Abnormal CL site appearance on day culture drawn [Y/N] Line-related phlebitis [Y/N] Compromised dressing [Y/N] Vomiting onto line dressing [Y/N] Stool/Urine onto line dressing [Y/N] Line repaired/exchanged in past 48 hours [Y/N] Line leaking events [ ] Care by temporary staff [ ] Care by non-NICU staff [ ] Staffing difficulties [ ] Improper line set-up [ ] Tubing/infusate NOT changed appropriately (method/time) [ ] Any other unusual event: (specify)
Infusates in Past 72 hours : [ ] TPN [ ] Lipids [ ] Blood products [ ] Steroids (3 x physiologic doses)	
Comments and Lessons Learned:	[ ] BSI (Not a CA-BSI) after further review (e.g., meets another CDC definition and there is another clear source identified), e.g. [ ] NEC [ ] VAP [ ] Other:_____
	[ ] CA-BSI (have data to determine that BSI fulfills CA-BSI criteria, i.e. BSI very likely related to CVL) *See page 2 for definition detail*
	[ ] Contaminant
	Adjudication Process:
	[ ] BSI Event was clearly able to be attributed/categorized into a CDC definition [ ] BSI Event required significant inferences/judgment to be attributed/categorized
	Action Plan: (Please relate to Fishbones, as applicable):

Positive Blood Culture Review-page 2

Patient Name: _____ MR #: _____

Cultures/Gram Stains

Date	Time	Source	Site of blood culture (if applicable)	Blood Volume (optional))	Date & Time Reported Positive	Organism	Comments #1 of _____

Laboratory Data

Date	Time	WBC	Segs/Bands	Plts	CRP	
		Other Tests				

Diagnostic Criteria	Notes
1.Requires 2 blood cultures drawn from separate sites, following skin disinfection with PI or CHG, within 48 hrs of each other. 2.The diagnosis of a laboratory confirmed (LC) catheter-associated BSI (CABSI) can only be made in the absence of another clinically appreciated infectious focus, the presence of one or more positive blood cultures, **and** one of the following three criteria being met: **Criteria 1)** at least one blood culture growing a recognized pathogen[1]; or **Criteria 2)** at least two blood cultures growing a recognized contaminant* and the presence of one (or more) clinical signs of generalized infection (either Fever > 38 ^{o}C[2] or Hypotension; or **Criteria 3)** Age < 1yr AND one of the following: Fever, Hypothermia[2] (<37 ^{o}C rectal), apnea, or bradycardia.	- Recognized pathogens are those not named as common skin contaminants. - *Common skin contaminants: diphtheroids, Bacillus species, Propioni-bacterium species, coagulase-negative staphylococci including S. Epidermidis, viridans group streptococci, Aerococcus or Micrococci The collaborative recommends that **axillary temperatures should be considered a screening method; axillary temperatures < 36.0 ^{o}C (< 96.8 ^{o}F) should be tentatively labeled as "hypothermia" and axillary temperatures > 38.0 ^{o}C (> 100.4 ^{o}F) should be tentatively labeled as fever.** Because of the variability in axillary temperature readings, the presence of an elevated or hypothermic temperature will only be termed **confirmed** if there have been **at least two consecutive abnormal axillary measurements or one abnormal axillary and one abnormal rectal (or other core) measurement.**

USER'S GUIDE TO THIS FORM: INSTRUCTIONS AND RATIONALE FOR INCLUDED ITEMS

Who should use this form and when should it be filled out?

We strongly recommend that the nurse who takes the first report of **any positive blood culture** should start noting his/her clinical observations about the event ***immediately***. "Charge" nurses," unit nursing supervisors" and clinicians should supplement these initial investigations within 24 hours, followed by a multi-disciplinary review of all findings and conclusions within several days of the initial report.

Top of Form:

Patient identification

Birth weight and GA (major epidemiologic risks factors)[1 2]

Timing of event distinguishes by convention emphasis on examining "maternal sources," i.e. < 72 hrs, from NICU sources for a hospital-acquired event, although the CDC no longer recommends making this distinction.[3]

Final Conclusion: ease of use (purposely duplicates conclusion at bottom of page)

Risk Factors:

Immuno-compromised: On NACHRI list. NICU relevancy suggested by common conditions, leukopenic post-PIH newborns, and uncommon ones: Kostmann syndrome, methylmalonic acidemia, etc. [4]

Compromised skin integrity:[5]

Open body cavity: On NACHRI list.

Ostomy site: On NACHRI list.

Surgical site infection receiving Rx:

Blood transfusion in last 72 hrs:[6]

NCPAP/Nasal cannula; potential site for traumatic erosion that facilitates colonizing organisms' invasion.

Feeding tube: potential site for traumatic erosion and/or mechanism for translocation infection.[7]

Enteral nutrition volume/parenteral volume ratio:___ (approximate. e.g. 1/3): means to capture approximate dependence on parenteral nutrition via vascular line(s)

Vascular Catheter[8]

Major surgery within past week [ ] or any other time. Specify type of surgery:

Catheter Information: **Only relevant if line(s) present within the 48 hr prior to first blood culture**

PIV ____# days (if multiple site, note only longest) and estimate # IV start attempts in last 72 hrs:[9]

Specify # day(s) for UAC, UVC, PICC or other CENTRAL lines in place when blood culture drawn

Estimate total # times all lines accessed during the **last 72 hours** (including for meds/blood draws/tubing changes, etc). Provides a simple measure of potential chances for break in technique.

Last date dressing changed:

Check list of events to consider that may have affected the continuing sterility of the line or its site:

- Antibacterial patch in use
- Abnormal Central Line (CL) site appearance on day culture drawn
- Line-related phlebitis
- Compromised dressing
- Vomiting onto line dressing
- Stool/Urine onto line dressing
- Line repaired/exchanged in past 48 hours
- Line leaking events

Check list of personnel and procedural events that may have affected the line's integrity:

- Care by temporary staff: Note: some users actually inventory all personnel who have cared for the line in the 72 hr period prior to the first positive blood culture. Potential training issue[10]?
- Care by non-NICU staff, e.g. radiology or OR: Potential training and care coordination issues?
- Staffing difficulties: Potential resource issue?
- Improper line set-up: Potential training issue?
- Tubing/infusate NOT changed appropriately: Potential training or leadership issues?
- Any other unusual event: (specify) Other potential system issue(s)?

Infusates in Past 72 hours TPN,[11] Lipids,[12] Blood products[13] and Steroids[14] (pharmacologic dosing is ~ 3 fold or greater than physiologic dosing) have each been linked to increased rates of CABSI.

Classify positive culture (after your review of the clinical evidence—this is the hard part!):

BSI (Not a CA-BSI) after further review, e.g., meets another CDC definition and there is another clear source identified) such as NEC, VAP or other identified source. or

Catheter-associated (CA)-BSI (have data to determine that BSI fulfills CA-BSI criteria as detailed on page 2

Contaminant: (If so, consider whether there were opportunities to avoid this happening.)

INSTRUCTIONS AND RATIONALE-CONTINUED

Adjudication Process: How hard was it to actually make the above determination?

BSI Event was clearly able to be attributed/categorized into a CDC definition
BSI Event required significant inferences/judgment to be attributed/categorized

Comments and Lessons Learned:

Use this space to any degree you wish to collate your observations and conclusions.

Action Plan: Please relate to Fishbones, as applicable

Use this space to map your plan to tackle opportunities for improvement. We recommend that you use the related HAI Prevention Fishbones as a way to define and relate these interventions to others. Fishbones available at: http://www.dhcs.ca.gov/ProvGovPart/initiatives/nqi/Pages/default.aspx and select: Fishbones.

SECOND PAGE:

Use as you desire to make notes and collect data (added by popular request)

USER FEEDBACK INVITED:

This crime scene investigation form is very much a work in process. We invite your feedback on ways to improve its utility and appropriateness (emails to CCS Listserver : CCSQI@dhcs.ca.gov or david.wirtschafter@juno.com)

REFERENCES FOR WHY THESE ITEMS WERE INCLUDED IN POSITIVE BLOOD CULTURE REVIEW

1 Mahieu Risk factors for central vascular catheter-associated bloodstream infections among patients in a neonatal intensive care unit Journal of Hospital Infection (2001) 48: 108–116.

2 Perlman Risk factors for late-onset health care–associated bloodstream infections in patients in neonatal intensive care units. Am J Infect Control 2007;35:177-82

3 Heath HA, Serr DM. Infections acquired in the nursery-Epidemiology and control. In JS. Remington, JO. Klein, CB Wilson, CJ Baker (ed.). Infectious Diseases of the Fetus and Newborn Infant.-6th Edition. The W. B. Saunders Co., Philadelphia, PA, 2006, pp 1179-11205

4 Lewis, DB, Wilson CB. Developmental immunology and role of host defense in fetal and neonatal susceptibility to infection. *In* JS. Remington, JO. Klein, CB Wilson, CJ Baker (ed.). Infectious Diseases of the Fetus and Newborn Infant.-6th Edition. The W. B. Saunders Co., Philadelphia, PA, 2006, pp 1179-11205.

5 Edwards WH. Preventing nosocomial bloodstream infection in very low birthweight babies. Semin Neonatal 2002;7: 325—333.

6 Elward Risk Factors for Nosocomial Primary Bloodstream Infection in Pediatric Intensive Care Unit Patients: A 2-Year Prospective Cohort Study. Infect Control Hosp Epidemiol 2006; 27:553-560.

7 Mehall. Prospective Study of the Incidence and Complications of Bacterial Contamination of Enteral Feeding in Neonates. J Pediatr Surg 37:1177-1182

8 Perlman Risk factors for late-onset health care–associated bloodstream infections in patients in neonatal intensive care units. Am J Infect Control 2007;35:177-82

9 Grant P, Chng C, Sanchez P. Relationship to skin puncture: attempts for IV placement to primary bacteremia in a NICU. Abstract presentation. APIC 24th Annual Conference; June 1997; New Orleans, LA

10 Puntis JW, Holden CE, Smallman S, Finkel Y, George RH, Booth IW. Staff training: a key factor in reducing intravascular catheter sepsis. Arch Dis Child 1991;66:335—337.

11 Perlman Risk factors for late-onset health care–associated bloodstream infections in patients in neonatal intensive care units. Am J Infect Control 2007;35:177-82.

12 Avila-Figueroa C, Goldmann DA, Richardson DK, Gray JE, Ferrari A, Freeman J. Intravenous lipid emulsions are the major determinant of coagulase-negative staphylococcal bacteremia in very low birth weight newborns. Pediatr Infect Dis J 1998;17:10-7

13 SEE REF 8

14 Halliday Moderately early (7-14 days) postnatal corticosteroids for preventing chronic lung disease in preterm infants (Cochrane Review).Cochrane Datasbase Syst Rev. 2002