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Evidence-based Practice for Improving Quality

# Nosocomial Infection Intervention Bundle May 2019

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MCare CIHR Team in Maternal-Infant Care

CPTBN Canadian Preterm Birth Network

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# Revised January 2019



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Items highlighted in yellow indicate the most significant interventions

| Grade of Recommendation | Clarity of risk/benefit | Quality of supporting evidence | Implications |
|---|---|---|---|
| **1A**<br>**Strong recommendation, high quality evidence** | Benefits clearly outweigh risk and burdens, or vice versa. | Consistent evidence from well performed randomized, controlled trials or overwhelming evidence of some other form. Further research is unlikely to change our confidence in the estimate of benefit and risk. | Strong recommendations, can apply to most patients in most circumstances without reservation. Clinicians should follow a strong recommendation unless a clear and compelling rationale for an alternative approach is present. |
| **1B**<br>**Strong recommendation, moderate quality evidence** | Benefits clearly outweigh risk and burdens, or vice versa. | Evidence from randomized, controlled trials with important limitations (inconsistent results, methodologic flaws, indirect or imprecise), or very strong evidence of some other research design. Further research (if performed) is likely to have an impact on our confidence in the estimate of benefit and risk and may change the estimate. | Strong recommendation and applies to most patients. Clinicians should follow a strong recommendation unless a clear and compelling rationale for an alternative approach is present. |
| **1C**<br>**Strong recommendation, low quality evidence** | Benefits appear to outweigh risk and burdens, or vice versa. | Evidence from observational studies, unsystematic clinical experience, or from randomized, controlled trials with serious flaws. Any estimate of effect is uncertain. | Strong recommendation, and applies to most patients. Some of the evidence base supporting the recommendation is, however, of low quality. |
| **2A**<br>**Weak recommendation, high quality evidence** | Benefits closely balanced with risks and burdens. | Consistent evidence from well performed randomized, controlled trials or overwhelming evidence of some other form. Further research is unlikely to change our confidence in the estimate of benefit and risk. | Weak recommendation, best action may differ depending on circumstances or patients or societal values. |
| **2B**<br>**Weak recommendation, moderate quality evidence** | Benefits closely balanced with risks and burdens, some uncertainly in the estimates of benefits, risks and burdens. | Evidence from randomized, controlled trials with important limitations (inconsistent results, methodologic flaws, indirect or imprecise), or very strong evidence of some other research design. Further research (if performed) is likely to have an impact on our confidence in the estimate of benefit and risk and may change the estimate. | Weak recommendation, alternative approaches likely to be better for some patients under some circumstances. |
| **2C**<br>**Weak recommendation, low quality evidence** | Uncertainty in the estimates of benefits, risks, and burdens; benefits may be closely balanced with risks and burdens. | Evidence from observational studies, unsystematic clinical experience, or from randomized, controlled trials with serious flaws. Any estimate of effect is uncertain. | Very weak recommendation; other alternatives may be equally reasonable. |


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| Hand Hygiene | | |
|---|---|---|
| **#** | **Intervention** | **Grade of Recommendation** |
| **1** | Perform critical analysis of workflow in the NICU to identify opportunities to improve access to alcohol-based hand rub | **1C** |
| **2** | Promote a clothing/jewelry policy that includes "the right to bare arms", avoidance of artificial nails and properly clipped natural fingernails (<1/4 in.) | **1C** |
| **3** | Ensure that all staff have a clear understanding of the 5 (or 6) moments for hand hygiene | **1C** |
| **4** | **REVISED!** Utilize an institution approved alcohol-based hand rub and ensure that it used according to directions (volume, skin coverage and contact time) | **1B** |
| **5** | Establish a culture of safety in which staff and families are empowered to speak up when there are breaches in technique | **1C** |
| **6** | Perform regular hand-hygiene audits in the NICU – provide immediate feedback to MDs/staff regarding performance and collate results for regular reporting using run-charts | **1B** |
| **7** | Provide hospital-grade skin moisturizing agents that are compatible with alcohol-based hand rub and locate them so that staff can readily access them to use between patient contacts | **1C** |
| **8** | Establish and identify zones around the patient that mandate hand hygiene if entered | **1C** |

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| Feeding | | |
|---|---|---|
| # | Intervention | Grade of Recommendation |
| 1 | Obtain colostrum from mothers of premature newborns to be given as “Oral Immune Therapy” | 1C |
| 2 | Ensure that mothers of newly born NICU patients begin regular pumping within 6 hours of birth and receive ongoing support to enhance breast milk supply | 1B |
| 3 | Feed exclusively with mother’s milk | 1B |
| 4 | Use banked human milk if mother’s milk is not available | 1C |
| 5 | Institute minimal enteral feedings on Day 1 | 1C |
| 6 | Utilize standardized feeding guidelines for initiation and advancement of feeds with the goal of reaching 120 ml/kg/day within 7-10 days | 1B |
| 7 | **NEW!** Use sterile water or non-water based approaches to defrost or warm expressed breast milk | 1C |

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| Line Insertion | | |
|---|---|---|
| **#** | **Intervention** | **Grade of Recommendation** |
| **1** | Avoid use of femoral lines | **NEW! 1C** |
| **2** | Use standardized “line cart” or “line tray” that contains all necessary equipment | **1B** |
| **3** | Use a dedicated line insertion team with standardized training and regular recertification utilizing an accepted evidence-based standard | **1A** |
| **4** | Shield area and restrict traffic during procedure | **1C** |
| **5** | Ensure that staff coming within one meter of sterile field don mask and cap | **1C** |
| **6** | Employ a checklist for all line insertions | **1A** |
| **7** | Perform audits to assess compliance with accepted insertion procedure | **1C** |
| **8** | Empower staff to “Stop the Line” if they observe any breach in technique | **1A** |

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| Line Insertion (Continued) | | |
|---|---|---|
| # | Intervention | Grade of Recommendation |
| 9 | Utilize maximal sterile barrier precautions during procedure | 1A |
| 10 | Double-glove for skin prep and draping – remove outer pair for insertion | 1C |
| 11 | **NEW!** Utilize two (2) person sterile technique for line insertion procedure | 1C |
| 12 | **NEW!** Employ standardized skin antisepsis techniques and guidelines | 1C |
| 13 | Use 2% chlorhexidine solution for skin prep. Ensure full coverage, use sparingly and allow to dry completely before penetrating the skin (warning: avoid for umbilical skin prep in ELGA infants who are less than 48 hrs of age) | 1A |
| 14 | Employ clean introducer for each attempt (skin break) | 1A |
| 15 | Restrict attempts to 2 per operator | 1C |

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| Line Management and Maintenance | | |
|---|---|---|
| # | Intervention | Grade of Recommendation |
| 1 | Critically review insertion site q shift for dressing integrity and site cleanliness – document in patient record | 1C |
| 2 | **REVISED!** Dressing changes PRN only, by a dedicated trained team, using a standardized dressing with sterile technique | 1C |
| 3 | **REVISED!** Employ closed, needleless fluid , medication administration and sampling systems designed and configured to minimize the risk of contamination . Do NOT use open luer or stopcock | 1A |
| 4 | Assemble and prime infusion tubing using sterile technique, ideally in dedicated off-unit space under laminar air flow; this process may also be useful for medication preparation | 1B |
| 5 | Perform audits to assess compliance with accepted line assembly and priming procedures | 1B |
| 6 | Utilize dedicated line team for connecting new infusion sets | 2C |
| 7 | **REVISED!** Change line tubing q 96 hr (Lipids q 24 hr). Blood component tubing is single use only with a maximum infusion time of 4 hours. Maintain a closed system whenever possible | 1B |
| 8 | Add heparin to TPN to a concentration of 0.5 IU/ml | 1B |

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| Line Management and Maintenance (Continued) | | |
|---|---|---|
| **#** | **Intervention** | **Grade of Recommendation** |
| **9** | "Scrub the Hub" with 70 % alcohol (with or without 2% chlorhexidine) for at least 15 seconds and allow surface to dry before making any line connections or entries | **1A** |
| **10** | **NEW!** Use sterile or aseptic (including non-sterile gloves) technique whenever accessing ports. Maintain a clean working surface | **1C** |
| **11** | Use prefilled syringes for line flushes | **2C** |
| **12** | Perform regular line connection / line entry audits | **2C** |
| **13** | **REVISED!** Consider using prophylactic fluconazole in ELBW infants with central catheters in place | **1B** |

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| Line Removal | | |
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| # | Intervention | Grade of Recommendation |
| 1 | Consider switching from UVC to PICC prior to 7 days of age if need for longer-term IV fluids is anticipated | 1B |
| 2 | Evaluate need for central line daily | 1B |
| 3 | Remove line when enteral intake reaches 120 ml/kg/day unless needed for medications | 1B |

| NEW! Education and Documentation | | |
|---|---|---|
| # | Intervention | Grade of Recommendation |
| 1 | NEW! Incorporate bundled elements into the Electronic Health Record to promote best practices and enhance accuracy of documentation | 1C |
| 2 | NEW! Use simulation and video for education to standardize central line insertions and maintenance processes | 1C |

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| NEW! Equipment and Environmental Considerations | | |
|---|---|---|
| # | Intervention | Grade of Recommendation |
| 1 | NEW! Use single patient use or dedicated equipment (stethoscopes, thermometer, etc) | 1C |
| 2 | NEW! Ensure robust cleaning routines for multiuse or shared patient equipment | 1C |

| Review of Infections by Multidisciplinary Team | | |
|---|---|---|
| # | Intervention | Grade of Recommendation |
| 1 | Consider any blood stream infection to be an adverse event | 1C |
| 2 | Convene a multidisciplinary team consisting of representatives from nursing, medicine, IP&C and administration to investigate each BSI | 1C |
| 3 | Utilize standardized template to investigate factors possibly contributing to the development of the BSI | 1C |

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