# NEONATAL BLOODSTREAM INFECTION PREVENTION ASSESSMENT (NEO BSI PREVENTION)

## An assessment to target prevention of bloodstream infections in neonatal care units

## Intended for use in global healthcare settings

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# Acknowledgements


## Development of the Neo BSI Prevention

Katie Wilson (International Infection Control Branch, Division of Healthcare Quality Promotion, U.S. CDC) led the development of the Neo BSI Prevention and coordinated the technical review process. Katie White, Rachel Snyder, and Ronda Sinkowitz-Cochran (Prevention and Response Branch, Division of Healthcare Quality Promotion, U.S. CDC) provided significant input into the assessment methodology and drafted the Excel Feedback Report. Amelia Keaton (International Infection Control Branch, Division of Healthcare Quality Promotion, U.S. CDC) and Chris Prestel (Prevention and Response Branch, Division of Healthcare Quality Promotion, U.S. CDC) contributed significantly to the content of the assessment. Marilyn Ponder (Division of Healthcare Quality Promotion, U.S. CDC) provided professional editing assistance.

## Technical Collaborators

The following subject matter experts participated in technical consultations to guide development and provide review of the assessment: Angela Dramowski (Pediatric Infectious Diseases, Stellenbosch University, South Africa), Aaron Milstone (Pediatric Infectious Diseases, Johns Hopkins University, USA), Indi Trehan (Pediatric Emergency Medicine/Pediatric Infectious Diseases, University of Washington/Seattle Children's Hospital, USA), Julia Johnson (Neonatology, Johns Hopkins University, USA), Susan Coffin (Pediatric Infectious Diseases, UPenn School of Medicine/ Children's Hospital of Philadelphia, USA), Tanya Rogo (Pediatric Infectious Diseases, BronxCare Health System, USA), W. Charles Huskins (Pediatric Infectious Diseases, Mayo Clinic, USA).

The following collaborators piloted the tool and provided technical expertise and implementation feedback: Flávio Melo (Pediatrician, Guarabira Regional Hospital, Brazil), Celia Martinez (Pediatric Infectious Diseases, Universidad Nacional de Asunción, Paraguay), Martha Alvarez (Pediatric Infectious Diseases, Fundación Cardioinfantil University Hospital, Colombia).

## Introduction

The Neonatal Bloodstream Infection Prevention Assessment (Neo BSI Prevention) is an assessment completed by frontline staff that identifies potential gaps in infection prevention and control (IPC) policies, training, and practices for preventing bloodstream infections in **neonatal care units**. This assessment is intended for use in global healthcare settings, particularly in low- and middle-income countries.

Standards and practices presented in assessment questions are based on:

- Recommendations for Prevention and Control of Infections in NICU Patients: CLABSI *(U.S. Centers for Disease Control and Prevention, 2022)*
- Guidelines for the Prevention of Bloodstream Infections and Other Infections Associated with the Use of Intravascular Catheters: Part 1—Peripheral Catheters *(World Health Organization, 2024)*
- Intravascular Catheter-related Infection (BSI) Prevention Guidelines *(U.S. Centers for Disease Control and Prevention, 2011)*
- Additional expert opinion and consultation during the development process for this assessment

## Intended Use

Neo BSI Prevention is intended for use within the context of quality improvement. The assessment identifies gaps in policies, training, and practices that can be targeted for change using quality improvement models, such as the Plan-Do-Study-Act cycle. The process for deploying the assessment and planning for next steps is summarized in the figure below.

This methodology is based on CDC's Targeted Assessment for Prevention (TAP) Strategy, which was used as a model for the development of this assessment. For more information, visit the CDC TAP Strategy Toolkit.


## Assessment Coordinator

Neo BSI Prevention is intended to be guided by a designated focal point. This may include a hospital-based representative, such as an IPC focal point or nurse leader, or an external representative from an organization collaborating with the hospital. This person leads the preparation for the assessment, is a point of contact during deployment of the assessment and leads post-assessment steps, which includes translating assessment findings into action plans as a starting point for quality improvement. Ideally, this person's position description includes leading quality improvement initiatives so that gaps identified through the assessment can be targeted for improvement. This individual will need protected time to complete the steps for this assessment.

## Target Units

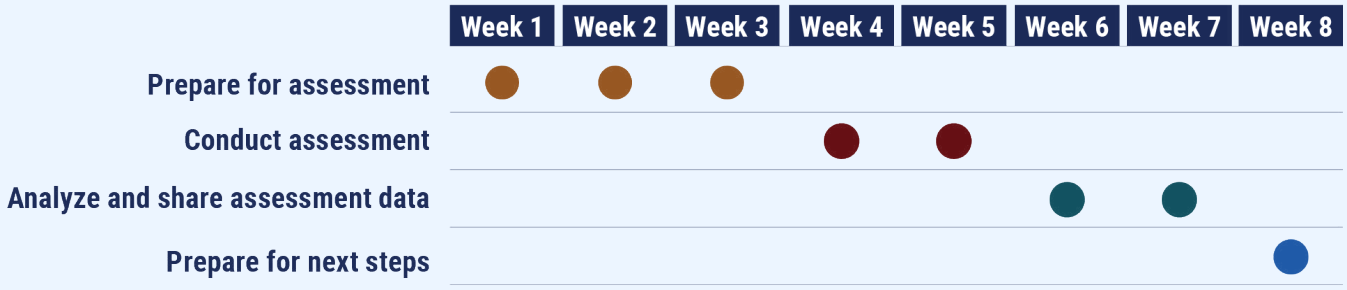
This assessment is designed for a neonatal care unit, which is a unit or ward **where specialized inpatient care for small (<1500g) or sick newborns is provided**. Specialized care includes respiratory support, cardiovascular support, temperature stability, fluid and nutrition support, treatment of congenital anomalies, treatment of certain infectious diseases or conditions, or care for other neonatal health issues. This includes units such as Neonatal Intensive Care Units, Special Care Nurseries, Newborn Care Nurseries, Kangaroo Mother Care Wards, or any other wards providing specialized neonatal care.

**Neo BSI Prevention was designed for use in a single unit. The assessment can be used in multiple units; however, it is intended for internal quality improvement and not for unit-to-unit comparison. Any use of Neo BSI Prevention results as a scorecard or benchmark should be interpreted with caution.**

## Instructions for Use

The instructions below detail each step in the assessment process and are intended to assist with 1) preparing for the assessment, 2) conducting the assessment, 3) analyzing and sharing data from the assessment, and 4) preparing for next steps.

It's important to understand all steps to using Neo BSI Prevention, as well as the suggested timeline, prior to starting. An example timeline is provided below. Each section provides more detailed actions recommended at each step.




# 01 Prepare for Assessment

## Get leadership buy-in and approval

Notifying unit-level leadership and senior facility leadership can ensure they are informed and supportive of unit staff taking time to complete the assessment. You may want to schedule a kick-off meeting to introduce the objectives of the assessment, review the steps that will be taken to deploy the assessment, and give a preliminary timeline for when the feedback report will be available. Check with facility leadership for any administrative approvals needed for conducting the assessment.

## Identify unit-based focal point

It can be beneficial to identify a staff member on the targeted unit to serve as a focal point for the assessment. This might be a charge nurse or other senior nurse on the unit. This person can coordinate logistics on the unit for the assessment, be the primary champion on the unit to encourage participation, assist with data entry, and help with follow-up tasks after the assessment.

## Understand assessment method

Neo BSI Prevention is not filled out by just one internal or external assessor. Neo BSI Prevention is self-administered by **as many healthcare personnel as possible in the unit**. This methodology allows for a more robust analysis of the gaps in policies, training and practices as actually identified by staff on the unit. It accounts for multiple points of view and can also lead to insights that might be missed by other assessment methodologies.

## Adapt Neo BSI Prevention to your unit

The assessment can be customized based on the context in your neonatal care unit, hospital, or country. This can include differences in terminology that your staff uses to refer to a particular item or supply. If translating the assessment to another language, double check that technical terms are interpreted correctly among staff.

**Roles:** In the Respondent Information section, additional healthcare roles can be added, changed or deleted based on names used on the unit (e.g., nursing assistant or nursing technician).

**Terminology:** Phrasing can be adapted to increase understanding among staff completing the assessment. Suggestions of terminology in the assessment that might benefit from a comprehension check among staff include:

- Maximum sterile barrier precautions
- Aseptic technique
- Antiseptic-containing connectors
- IV tubing used for continuous infusions
- *Any other terms identified*

## Determine data collection method

The assessment can be administered on paper or through an electronic survey platform. If you choose to use an electronic survey platform, the assessment will need to be built into the platform, which can take additional time and resources. Of note, an Excel workbook that is pre-programmed to aggregate data and generate a summary report is available; see Section 3 (Analyze and Share Assessment Data) for more information and instructions.

Below are key considerations as you decide which method will work best for your unit:

**Paper:** This can be most accessible, as staff can complete and then return to a designated person or box in the unit. If distributing the assessment on paper, you will need to manually enter data into Excel, or another software application of your choosing, for assessment analysis and feedback.

**Electronic:** The assessment will need to be built in a survey or data capture platform. Staff will also need individual access to a computer or smartphone to complete the survey. Testing or piloting the electronic form can help to avoid any technical difficulties for unit staff. Electronic data can be imported into the data entry sheet in the Excel workbook, which can significantly reduce time needed for data entry.

### Identify respondent groups

Neo BSI Prevention can be completed by all cadres of healthcare personnel, including frontline providers (e.g., nurses, nursing assistants, physicians), mid-level staff (e.g., IPC Focal point, unit/nurse managers), support staff as appropriate (medical assistants, pharmacists), and senior leadership. The greater the number of assessments collected, the greater the ability to identify gaps and target improvement activities.

### Review answer options

There are two main types of response options in the assessment: Yes/No/Do Not Know and a Likert scale (Never to Always). Questions with a Yes/No/Do Not Know response option ask about the respondents' knowledge or perception of policies and practices as well as whether they have received training on key practices. Questions with a Likert scale (Never, Rarely, Sometimes, Often, Always) ask about the respondents' perceptions of the frequency of that practice on the unit.

### Identify additional champions

Enlist champions to encourage staff to complete the Neo BSI Prevention assessment. The more assessments collected, the greater the ability to identify gaps that can be targeted for prevention efforts.

## 02 Conduct Assessment

### Distribute assessments

Distribute the Neo BSI Prevention using the data collection method selected—paper or electronic. You can create signs to help remind staff, share reminders during daily check-ins, or send e-mail reminders to encourage participation. If using paper assessments, make sure staff know where to return the assessment once complete, such as a designated person, box or folder on the unit.

## Spread the word about the assessment

There are many ways to encourage participation among staff—get creative! Some initial ideas are to send reminders to leadership, give a short (e.g., 5-minute) session at staff meetings or huddles to explain Neo BSI Prevention, or motivate staff with a small token of appreciation like a certificate or other meaningful praise. An example message to staff is provided below for your use.

**Example**

As part of our quality improvement efforts to prevent bloodstream infections (BSI) in our unit, we are asking staff to please complete the Neo BSI Prevention assessment. We value your input and appreciate your feedback as we work together to improve patient safety.

The assessment can be completed on paper [*include information for where to pick up and return assessment*]. [*If using an online platform, explain how to access and complete with a web link.*]

Filling out the Neo BSI Prevention assessment will take about 10–15 minutes. All responses are anonymous. We will be collecting responses until [*include collection period*]. Please contact [*point of contact*] with any questions.

# 03 Analyze and Share Assessment Data

**An Excel Feedback Report template that is pre-programmed to aggregate data and generate a summary report is available for download on CDC's International Infection Control Resources web page.**

## Enter data

If using an online data collection platform, you can import data into the **Data Entry** tab of the Excel Feedback Report. Some data cleaning might be needed to ensure all responses are imported correctly into the worksheet.

If collecting the assessment on paper, each assessment completed will need to be entered as a separate row on the **Data Entry** tab of the Excel Feedback Report. Data validation, including drop-down menus, are built into each column as needed.

Detailed instructions for entering data into the Data Entry sheet can be found on the Data Entry Instructions tab within the Excel file.

## Generate feedback report

Once data are entered in the **Data Entry** tab, the data are automatically aggregated on the tab titled **Feedback Report**. The Excel Feedback Report allows data to be viewed through filters such as job role, shift worked, and years of experience.

Detailed instructions for using, modifying, and printing a PDF summary are included on the Feedback Report Instructions tab. You may choose to replicate or modify the Excel Feedback Report in a data application of your choosing.

## Share results with staff and leadership

Once data from the assessment are compiled, whether in the Excel Feedback Report or any other data summary application you might use, make sure that results are shared with unit staff and leadership.

For staff, consider how to best communicate results. Some ideas are to create a slide set, poster, or newsletter summarizing results and how their input will be used. For leadership, results can be included in ongoing meetings, or you might consider scheduling a separate meeting to walk leadership through a summary of the results and any requests for leadership support for next steps.

# 04 Prepare for Next Steps

Neo BSI Prevention identifies potential gaps in IPC that can guide improvement efforts. In addition to the domains covered in the assessment, there may also be additional gaps highlighted that you may want to include in your action plan. Your unit can adapt and modify any available quality improvement guides that are most relevant for your prioritization and implementation efforts.

**Resource**

The TAP Prevention Prioritization Toolkit on the CDC website is an available resource for planning and implementing quality improvement efforts. It includes example tools for prioritizing gaps, implementing a plan, piloting small tests of change, and other worksheets to guide you through the process.

There are additional resources on the TAP Strategy website that may be of interest to your unit for quality improvement activities.

***Note: A Neo BSI Prevention Toolkit, with resources to support quality improvement implementation, is currently in development. Once complete, it will be linked in an updated version of the Neo BSI Prevention Guide and available on CDC's International Infection Control Resources web page.***

# Neonatal Bloodstream Infection Prevention Assessment (Neo BSI Prevention)

## An assessment to target prevention of BSIs in neonatal care units

***Before you fill out this assessment:***

- This assessment asks about policies, training, and your perceptions of practices on the unit for preventing bloodstream infections.
- Responses should reflect what practices are currently in place in the unit, as well as your perception of practices on the unit, as opposed to reporting your own practices.
- This assessment is anonymous and no personally identifiable information will be collected. It will take about 10–15 minutes to complete.

### Respondent Information

Today's date (dd/mm/yyyy): _____ Unit Name: _____

What is your role? (select one): ○ Physician ○ Nurse ○ Nursing Technician ○ IPC Professional ○ Pharmacist ○ Other (please list): _____

Number of years in role: _____ (Enter a number: <1, 1, 2, 3, etc.) Number of years on this unit: _____ (Enter a number: <1, 1, 2, 3, etc.)

Do you **insert** or assist with insertion of central lines (for example, PICC or umbilical catheter)? ○ Yes ○ No

Do you **maintain** or assist with maintenance of central lines? ○ Yes ○ No

Do you **insert** or assist with insertion of peripheral IVs? ○ Yes ○ No

Do you **maintain** or assist with maintenance of peripheral IVs? ○ Yes ○ No

Primary shift worked (select one): ○ Day ○ Night ○ Both

**For all questions, respond based on your knowledge and perception of policies and practices on the unit.**

### 1. Leadership and Coordination

| | | | | |
|---|---|---|---|---|
| 1. | Is unit leadership (medical or nursing) involved in prevention activities for bloodstream infections? | ○ Yes | ○ No | ○ Do Not Know |
| 2. | Is there a dedicated person(s) in the unit that focuses on prevention activities for bloodstream infections? | ○ Yes | ○ No | ○ Do Not Know |
| 3. | Does the unit review each case when a bloodstream infection occurs to identify potential gaps in practice? | ○ Yes | ○ No | ○ Do Not Know |

## 2A. Central Lines (Central Venous Catheters, Peripherally Inserted Central Catheters)

| | |
|---|---|
| 1. Does the unit have a protocol for central line use? *(for example, protocol for insertion, maintenance, and removal)* | ○Yes ○No ○Do Not Know |
| 2. Does the unit have ready-to-use central line insertion kits? | ○Yes ○No ○Do Not Know |
| 3. Does the unit have ready-to-use dressing change kits? | ○Yes ○No ○Do Not Know |
| 4. Are antiseptic-containing connectors used on the unit? | ○Yes ○No ○Do Not Know |
| 5. Does the unit document when a central line is inserted? *(for example, in the medical record)* | ○Yes ○No ○Do Not Know |
| 6. *Did you receive training from your hospital on* **inserting** *central lines?* | *Choose all that apply:*<br>☐ A. During hire or orientation<br>☐ B. At least annually<br>☐ C. When there are new devices or protocols<br>☐ D. Never trained<br>☐ E. I do not perform this procedure |
| 7. *Did you receive training from your hospital on* **maintaining** *central lines? (Maintaining can mean performing a dressing change, accessing the line to administer medication, etc.)* | *Choose all that apply:*<br>☐ A. During hire or orientation<br>☐ B. At least annually<br>☐ C. When there are new devices or protocols<br>☐ D. Never trained<br>☐ E. I do not perform this procedure |
| 8. Did your training on central lines include aseptic technique for insertion? (for example, using clean or sterile gloves) | ○Yes ○No ○Do Not Know<br>○Did not receive training |
| 9. Did your training on inserting central lines include maximum sterile barrier precautions? *(Maximum sterile barrier precautions includes use of sterile gown, sterile gloves, mask, and cap and a sterile drape to cover neonate.)* | ○Yes ○No ○Do Not Know<br>○Did not receive training |
| 10. Did your training include use of aseptic technique while accessing or manipulating the catheter? | ○Yes ○No ○Do Not Know<br>○Did not receive training |
| 11. Did your training include assessing the insertion site for any signs of infection? | ○Yes ○No ○Do Not Know<br>○Did not receive training |
| 12. Did your training include management of IV tubing? *(for example, when to change IV tubing sets)* | ○Yes ○No ○Do Not Know<br>○Did not receive training |

| 2B. Central Line Practices | Never | Rarely | Sometimes | Often | Always | Do Not Know |
|---|---|---|---|---|---|---|
| 1. Do physicians provide a written order for central lines? | ○ | ○ | ○ | ○ | ○ | ○ |
| 2. Are central lines preferred over peripheral lines if long-term venous access is needed? *(for example, more than one week)* | ○ | ○ | ○ | ○ | ○ | ○ |
| 3. Are central lines inserted by personnel trained on insertion? | ○ | ○ | ○ | ○ | ○ | ○ |
| 4. Do personnel perform hand hygiene before putting on sterile gloves for insertion? | ○ | ○ | ○ | ○ | ○ | ○ |
| 5. Is skin prepared with antiseptic before insertion? *(chlorhexidine, povidone-iodine)* | ○ | ○ | ○ | ○ | ○ | ○ |
| 6. Is antiseptic allowed to air dry before skin puncture? | ○ | ○ | ○ | ○ | ○ | ○ |
| 7. Do healthcare personnel use the following maximum sterile barrier precautions when inserting a central line? | | | | | | |
| 7a) Surgical cap | ○ | ○ | ○ | ○ | ○ | ○ |
| 7b) Mask | ○ | ○ | ○ | ○ | ○ | ○ |
| 7c) Sterile gown | ○ | ○ | ○ | ○ | ○ | ○ |
| 7d) Sterile gloves | ○ | ○ | ○ | ○ | ○ | ○ |
| 7e) Sterile drape to cover neonate | ○ | ○ | ○ | ○ | ○ | ○ |
| 8. Do at least two healthcare personnel insert a central line? *(one who performs insertion and one who observes/assists with supplies)* | ○ | ○ | ○ | ○ | ○ | ○ |
| 9. Do healthcare personnel stop central line insertion (non-emergent) if proper procedures are not followed? | ○ | ○ | ○ | ○ | ○ | ○ |
| 10. Are central lines with the minimum number of lumens used? | ○ | ○ | ○ | ○ | ○ | ○ |
| 11. Are central lines secured to the skin without sutures? *(for example, a securement device without sutures)* | ○ | ○ | ○ | ○ | ○ | ○ |
| 12. Are central line insertion sites covered with a sterile dressing? *(sterile gauze or sterile, transparent dressing)* | ○ | ○ | ○ | ○ | ○ | ○ |
| 13. Are central lines assessed daily *(for example, during patient rounds)* to ensure they are still needed? | ○ | ○ | ○ | ○ | ○ | ○ |
| 14. Are central lines maintained and accessed only by trained healthcare personnel? | ○ | ○ | ○ | ○ | ○ | ○ |
| 15. Is hand hygiene performed before manipulating a central line? *(for example, accessing or performing a dressing change)* | ○ | ○ | ○ | ○ | ○ | ○ |
| 16. Are central lines accessed with **only sterile** devices? *(for example, syringes and tubing)* | ○ | ○ | ○ | ○ | ○ | ○ |
| 17. Are access ports or hubs cleaned immediately prior to use with an antiseptic? *(chlorhexidine, povidone iodine, or 70% alcohol)* | ○ | ○ | ○ | ○ | ○ | ○ |
| 18. Is skin prepared with antiseptic during dressing changes? *(chlorhexidine, povidone iodine, or 70% alcohol)* | ○ | ○ | ○ | ○ | ○ | ○ |
| 19. Are dressings changed using aseptic technique? | ○ | ○ | ○ | ○ | ○ | ○ |

| 2B. Central Line Practices (cont.) | Never | Rarely | Sometimes | Often | Always | Do Not Know |
|---|---|---|---|---|---|---|
| 20. Are dressings immediately replaced when wet, soiled, or dislodged? | ○ | ○ | ○ | ○ | ○ | ○ |
| 21. Is IV tubing used for continuous infusions changed every 4 days? | ○ | ○ | ○ | ○ | ○ | ○ |
| 22. Is IV tubing used for blood, blood products, or fat emulsions changed every 24 hours? | ○ | ○ | ○ | ○ | ○ | ○ |
| 23. Are insertion sites routinely monitored for signs of infection? (*for example, induration, erythema*) | ○ | ○ | ○ | ○ | ○ | ○ |
| 24. Are central lines that are no longer needed promptly removed? (*for example, within 24 hours*) | ○ | ○ | ○ | ○ | ○ | ○ |
| 25. Are central lines removed immediately if there are any signs of catheter-related bloodstream infection or thrombosis? | ○ | ○ | ○ | ○ | ○ | ○ |
| 26. Is removal of a central line performed using aseptic technique? | ○ | ○ | ○ | ○ | ○ | ○ |

## 3. Umbilical Catheters

| | | | |
|---|---|---|---|
| 1. Does the unit have a policy for the length of time an **umbilical venous catheter** can remain in place? (*for example, no more than 7 days*) | ○Yes | ○No | ○Do Not Know |
| 2. Does the unit have a policy for the length of time an **umbilical arterial catheter** can remain in place? (*for example, no more than 7 days*) | ○Yes | ○No | ○Do Not Know |
| 3. Does the unit avoid using topical antibiotic ointment or creams on umbilical catheter sites? | ○Yes | ○No | ○Do Not Know |
| 4. Are umbilical lines secured to the skin without sutures? (*for example, a securement device without sutures*) | ○Yes | ○No | ○Do Not Know |

## 4A. Peripheral IVs

| | |
|---|---|
| 1. Did you receive training from your hospital on **inserting** peripheral IVs? | *Choose all that apply:*<br>☐ A. During hire or orientation<br>☐ B. At least annually<br>☐ C. When there are new devices or protocols<br>☐ D. Never trained<br>☐ E. I do not perform this procedure |
| 2. Did you receive training from your hospital on **maintaining** peripheral IVs? | *Choose all that apply:*<br>☐ A. During hire or orientation<br>☐ B. At least annually<br>☐ C. When there are new devices or protocols<br>☐ D. Never trained<br>☐ E. I do not perform this procedure |
| 3. Did your training on peripheral IVs include precautions during insertion? (*hand hygiene, use of clean gloves, skin antisepsis*) | ○ Yes ○ No ○ Do Not Know<br>○ Did not receive training |
| 4. Did your training on peripheral IVs include precautions when accessing an IV? (*hand hygiene, use of clean gloves*) | ○ Yes ○ No ○ Do Not Know<br>○ Did not receive training |
| 5. Did your training on peripheral IVs include assessing the site for any signs of infection? | ○ Yes ○ No ○ Do Not Know<br>○ Did not receive training |

| 4B. Peripheral IV Practices | Never | Rarely | Sometimes | Often | Always | Do Not Know |
|---|---|---|---|---|---|---|
| 1. Is hand hygiene performed before putting on gloves for inserting a peripheral IV? | ○ | ○ | ○ | ○ | ○ | ○ |
| 2. Are clean, single-use gloves worn to insert a peripheral IV? | ○ | ○ | ○ | ○ | ○ | ○ |
| 3. Is skin antisepsis performed prior to inserting a peripheral IV? | ○ | ○ | ○ | ○ | ○ | ○ |
| 4. Are peripheral IVs secured on neonates? (*for example, steristrips, splint if needed*) | ○ | ○ | ○ | ○ | ○ | ○ |
| 5. Does the unit document when a peripheral IV is inserted? (*for example, in the medical record*) | ○ | ○ | ○ | ○ | ○ | ○ |
| 6. Is hand hygiene performed before accessing a peripheral IV? (*medication administration, dressing changes*) | ○ | ○ | ○ | ○ | ○ | ○ |
| 7. Is skin antisepsis performed prior to accessing a peripheral IV? | ○ | ○ | ○ | ○ | ○ | ○ |

| 4B. Peripheral IV Practices (cont.) | Never | Rarely | Sometimes | Often | Always | Do Not Know |
|---|---|---|---|---|---|---|
| 8. Are ports or caps disinfected each time a peripheral IV is accessed? | ○ | ○ | ○ | ○ | ○ | ○ |
| 9. Are peripheral IVs flushed with sterile saline after infusion? | ○ | ○ | ○ | ○ | ○ | ○ |
| 10. Are pre-filled syringes used for saline flushes? (*pre-filled with saline from manufacturer*) | ○ | ○ | ○ | ○ | ○ | ○ |
| 11. Is IV tubing used for continuous infusions changed every 4 days? | ○ | ○ | ○ | ○ | ○ | ○ |
| 12. Is IV tubing used for blood, blood products, or fat emulsions changed every 24 hours? | ○ | ○ | ○ | ○ | ○ | ○ |
| 13. Are peripheral IVs assessed daily (*for example, during patient rounds*) to ensure they are still needed? | ○ | ○ | ○ | ○ | ○ | ○ |
| 14. Are peripheral IVs removed immediately when no longer needed? | ○ | ○ | ○ | ○ | ○ | ○ |
| 15. Are peripheral IVs checked regularly (*for example, every day*) for signs of infection? (*swelling, redness, induration*) | ○ | ○ | ○ | ○ | ○ | ○ |
| 16. Are peripheral IVs removed promptly when there is sign of infection? | ○ | ○ | ○ | ○ | ○ | ○ |

| 5. Medication Preparation Practices | Never | Rarely | Sometimes | Often | Always | Do Not Know |
|---|---|---|---|---|---|---|
| 1. Does a pharmacist review medication that is prescribed for neonates? | ○ | ○ | ○ | ○ | ○ | ○ |
| 2. Is medicine prepared in a designated area? (*for example, away from potential sources of contamination such as sinks*) | ○ | ○ | ○ | ○ | ○ | ○ |
| 3. Is the medication preparation area cleaned and disinfected regularly? (*for example, once a day*) | ○ | ○ | ○ | ○ | ○ | ○ |
| 4. Are supplies accessible where medicines are prepared? (*such as alcohol-based hand rub, needles and syringes in sterile packaging, alcohol wipes, sharps bins*) | ○ | ○ | ○ | ○ | ○ | ○ |
| 5. Is hand hygiene performed before preparing medication? | ○ | ○ | ○ | ○ | ○ | ○ |
| 6. Is the rubber diaphragm (vial) or neck (ampoule) disinfected before accessing? | ○ | ○ | ○ | ○ | ○ | ○ |
| 7. Is the disinfectant allowed to air dry before accessing the vial or ampoule? | ○ | ○ | ○ | ○ | ○ | ○ |
| 8. Is a single-dose vial used for only one neonate? | ○ | ○ | ○ | ○ | ○ | ○ |
| 9. Is a single-dose vial discarded after one use? (*even if there is medication left over*) | ○ | ○ | ○ | ○ | ○ | ○ |
| 10. Is a new, sterile needle and syringe used to access a **single-dose** vial? | ○ | ○ | ○ | ○ | ○ | ○ |
| 11. Is a new, sterile needle and syringe used to access a **multi-dose** vial? | ○ | ○ | ○ | ○ | ○ | ○ |

| 5. Medication Preparation Practices (cont.) | Never | Rarely | Sometimes | Often | Always | Do Not Know |
|---|---|---|---|---|---|---|
| 12. Are multi-dose vials stored away from the neonate's bedside? (*for example, stored in the medication preparation area*) | ○ | ○ | ○ | ○ | ○ | ○ |
| 13. Are multi-dose vials discarded within their expiration date? (*28 days, unless the manufacturer specifies a different expiration date*) | ○ | ○ | ○ | ○ | ○ | ○ |
| 14. Are IV solutions (*for example, infusion bags*) kept free from needle punctures/spikes? | ○ | ○ | ○ | ○ | ○ | ○ |
| 15. Is a sterile diluent, such as water or saline in 10ml vials, used to reconstitute a medication? (*for example, preparing antibiotic for injection*) | ○ | ○ | ○ | ○ | ○ | ○ |
| 16. Are IV solutions (*for example, infusion bags*) used only for infusion? (*In other words, they are NOT used to dilute or reconstitute medicine.*) | ○ | ○ | ○ | ○ | ○ | ○ |