NICU/PICU Intermittent Programming
Alaris® Syringe module

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NICU/PICU Intermittent Syringe Programming

We have found that unique challenges exist around the delivery of intermittent medications with very small volumes when using smart pump technology.

With these small volumes:

- It is not uncommon for a portion of the required dose to be used to prime the IV tubing leaving only part of the dose volume in the syringe. When programming these infusions, it is important to calculate the infusion rate using the total dose volume and not just the remaining volume in the syringe.

- When programming, it is very important to account for the volume of medication in the syringe as well as the volume of medication that may remain in the line after the medication syringe is complete. It is important to program the flush at the same rate as the medication in order to deliver the medication remaining in the line at the correct rate.
Scenario 1 – Line Primed with Medication

Important to Note:

- When the line is primed with medication, the medication will start being administered at the start of the infusion.

- After the medication infusion is complete, it is important to program the flush at the same rate as the medication in order to deliver the medication remaining in the line at the correct rate.

- There is no additional time added to the infusion for the delivery of Saline prime volume already in the line.

- When the infusion completes, Saline will remain in the med line.
Scenario 2 – Line Primed with Saline

Important to Note:

- When the line is primed with Saline, the prime volume will be infused at the same rate as the medication. This will add to the total infusion time (prime volume + medication volume).

- Note that the medication is still infused over the correct amount of time (30 min for the example shown here).

- After the medication infusion is complete, it is important to program the flush at the same rate as the medication in order to deliver the medication remaining in the line at the correct rate.

- When the flush completes, Saline will remain in the med line.
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The following data is applicable for all programming scenarios.

Dr Order:
- Ampicillin 300mg (100mg/kg) IV every 12 hours
- Patient Weight: 3kg
- Drug Concentration: 100mg/mL
- Prime volume of tubing: 0.5mL
- Total Drug Volume: 3mL
Scenario 1 – Line Primed with Medication

Note:
For intermittent infusions, when the line has been primed with medication, it is recommended that the user select RATE/VOLUME and enter the desired rate.

- RATE: The Alaris® Syringe module uses DURATION and VTBI (NOT total dose volume) to calculate RATE.
- DURATION: The Alaris® Syringe module uses RATE and VTBI (NOT total dose volume) to calculate DURATION.

If the duration field is populated with an initial duration value, the clinician must still enter the calculated rate. For example, if the Duration of 30 minutes is pre-populated in step 6, the pump will use the 30 minutes and the available volume of 2.5 mL (only part of the total dose volume) to calculate a rate of 5 mL/h instead of the correct rate of 6 mL/h.
Scenario 1 – Line Primed with Medication (cont’d)

The Rate can be:
- Obtained from the medication label (preferred)
  - or -
- Calculated using the total medication volume and the amount of time the medication should be delivered over (3 mL x 2 = 6 mL/h).

<table>
<thead>
<tr>
<th>Desired Delivery Time</th>
<th>Multiply Dose Volume by</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 min</td>
<td>4</td>
</tr>
<tr>
<td>20 min</td>
<td>3</td>
</tr>
<tr>
<td>30 min</td>
<td>2</td>
</tr>
<tr>
<td>60 min</td>
<td>1</td>
</tr>
<tr>
<td>120 min</td>
<td>Divide by 2</td>
</tr>
</tbody>
</table>

Note: Once the RATE is programmed, the DURATION will automatically be calculated based on the RATE and VTBI.

After the infusion completes, the med line is still filled with medication. It is important to use a flush to deliver the medication remaining in the line. The flush should be delivered at the same rate as the medication.
Scenario 2 – Line Primed Saline

Note:
For intermittent infusions, where the line has been primed with Saline, it is recommended that the user enter the desired duration or confirm the Initial duration Value that was prepopulated for the infusion.

- **RATE:** The Alaris® Syringe module uses DURATION and VTBI (NOT total dose volume) to calculate RATE.
- **DURATION:** The Alaris® Syringe module uses RATE and VTBI (NOT total dose volume) to calculate DURATION.

If the DURATION field is populated with an initial duration value, simply confirm that the duration is correct and press START. If an initial duration value has not been set up by the hospital, the appropriate duration should be entered at this point (screen 6). In this scenario, the pump will use the 30 minutes and the available volume of 3 mL to calculate the correct rate of 6 mL/h.
Scenario 2 – Line Primed with Saline (cont’d)

The Duration can be:
- Prepopulated if the hospital has set-up an initial duration value.
  - or -
- Obtained from the medication label.

Note: Once the DURATION is programmed, the RATE will automatically be calculated based on the DURATION and VTBI.

After the infusion completes, the med line is still filled with medication. It is important to use a flush to deliver the medication remaining in the line. The flush should be delivered at the same rate as the medication.
Flush Options

A flush can be programmed in two different ways:

- **Using the RESTORE feature.**
  - When using the restore feature, the rate from the previous infusion is automatically populated. The user programs the VTBI (flush volume) and confirms the programming and then presses start.

  - The display screen will scroll the name of the medication you are flushing. There will be no indication that there is a flush syringe loaded into the syringe module.

- **Selecting "Flush" from the Guardrails Fluids library.**
  - When programming using the “Flush” entry from the fluids library, the user will need to program the correct rate (the same rate that they infused the medication) and the VTBI (flush volume). They can then confirm their programming and start the flush.

  - After the medication infusion is complete, it is important to program the flush at the same rate as the medication in order to deliver the medication remaining in the line at the correct rate.

  - The display screen will scroll “Flush” and not the name of the medication being infused.

The following two scenarios will walk through the workflow for each of the flushing options.
Flush Option 1 - RESTORE

1. Remove Med Syringe, replace with a flush syringe and Select Channel

2. Syringe Selection
   - BD 3 mL

3. Syringe Selection
   - Confirm Syringe Size

4. Infusion Menu
   - Select an Option or Restore Previous Infusion
   - Press CONFIRM
   - Press RESTORE

5. Quadralis Drug Setup
   - Ampicillin
   - AMOUNT: 300 mg
   - DILUENT VOLUME: 3 mL
   - WEIGHT: 3 kg
   - DOSE: 100 mg/kg
   - Press NEXT to Confirm

6. Quadralis Drug Setup
   - PRIMARY INFUSION
   - RATE: 6 mL/h
   - VTBI: ALL
   - Time Left: 00 h 30 min
   - DOSE: 100 mg/kg
   - [Conc]: 100 mg/mL
   - Press START

7. Quadralis Drug Setup
   - PRIMARY INFUSION
   - RATE: 0.5 mL/h
   - VTBI: ALL
   - Time Left: 00 h 05 min
   - DOSE: 100 mg/kg
   - [Conc]: 100 mg/mL
   - Press START

8. Midtown Hospital
   - Ampicillin 100 mg/kg
   - Delay Options
   - VTBI Options
   - Press START

**Note:**
- In order to deliver the medication remaining in the med line safely, the flush should be programmed to deliver at the same RATE as the medication.

- If volume in flush syringe is greater than desired flush volume, VTBI must be edited.

**Note:**
- Device will continue to scroll the medication name (Ampicillin).
Flush Option 2 - Guardrails Library

1. Midtown Hospital NICU
   A. Complete
   B
   C
   D

2. Syringe Selection
   BD 3 mL

3. Syringe Selection
   Confirm Syringe Size
   Confirm

4. Infusion Menu
   Guardrails Drugs
   Guardrails Fluids
   Basic Infusion
   Select an Option or Restore Previous Infusion
   Restore

5. Select FLUSH

6. Guardrails Fluid Setup
   FLUSH
   PRIMARY INFUSION
   Yes
   No
   Press Yes or No

7. Enter RATE of 6 mL/h & Edit VTBI (if necessary)

8. Press START

Note:
- In order to deliver the medication remaining in the med line safely, the Flush should be programmed to deliver at the same rate as the medication.
- If volume in flush syringe is greater than desired flush volume, VTBI must be edited.