



# NICU/PICU Intermittent Programming

## Alaris® Syringe module

December 2014



## NICU/PICU Intermittent Syringe Programming

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

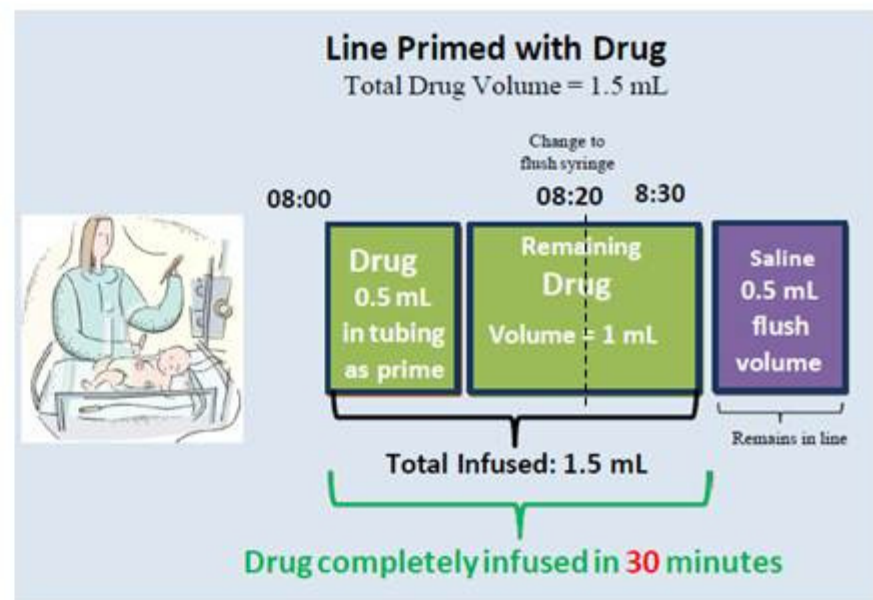
**With these small volumes:**

- 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:

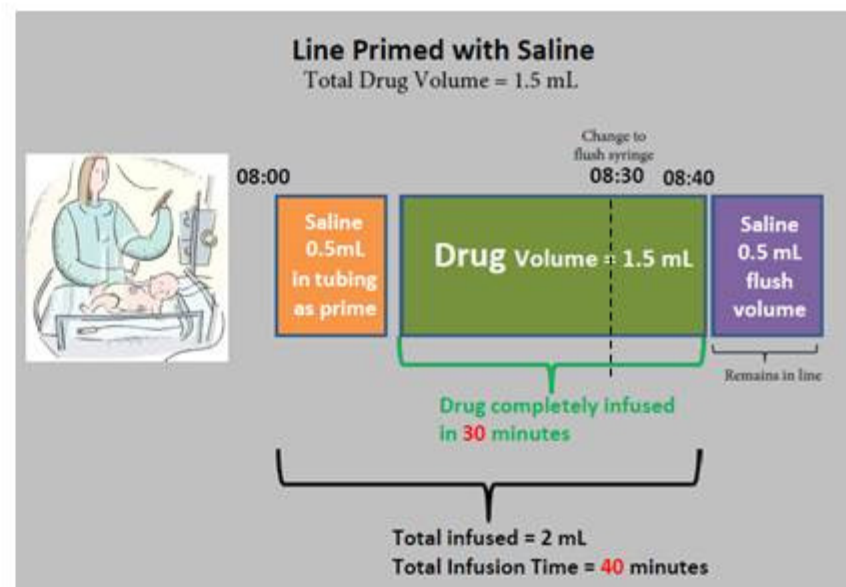
- When the line is primed with medication, the medication will start being administered at the start of the infusion.
- After the medication infusion is complete, it is important to program the flush at the same rate as the medication in order to deliver the medication remaining in the line at the correct 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.





## NICU/PICU Intermittent Syringe Programming

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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

1

**A Syringe Selection**  
BD 3 mL

>Confirm Syringe Size

ALL SYRINGES **CONFIRM**

Select & CONFIRM  
Syringe size/brand

2

**A Infusion Menu**

Guardrails Drugs  
Guardrails Fluids  
Basic Infusion

>Select an Option or  
Restore Previous Infusion

RESTORE EXIT

Select  
Guardrails Drugs

3

**Guardrails Drugs**  
NICU

Acydlovir	A-E
Aminophylline	F-J
Amphotericin B	K-O
<b>Ampicillin</b>	P-T
	U-Z

>Select Drug

EXIT DRUG CALC PAGE DOWN

Select Ampicillin

4

**A Guardrails Drug Setup**  
NICU

Ampicillin  
mg/mL  
was selected.  
Is this correct?  
DOSING UNITS mg/kg

**Yes** No

>Press Yes or No

Press Yes to confirm  
Custom concentration  
programming

5

**A Guardrails Drug Setup**  
NICU

DRUG AMOUNT **300 mg**  
DILUENT VOLUME **3 mL**  
PATIENT WEIGHT **3 kg**  
DOSE = **100 mg/kg**  
[Conc]: 100 mg/mL  
>Press NEXT to Confirm

DRUG LIBRARY **NEXT**

Enter DRUG AMOUNT,  
DILUENT VOLUME and  
PATIENT WEIGHT.  
Press NEXT to Confirm.

6

**A Guardrails Drug Setup**  
Ampicillin

PRIMARY INFUSION

RATE = **ALL** mL/h available (2.5 mL)

VTBI **ALL**

DURATION **ALL** h min

DOSE = **100 mg/kg**  
[Conc]: 100 mg/mL  
>Select DURATION

**RATE VOLUME** SETUP

Select RATE/VOLUME

## 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 edit 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)

6

**A** Guardrails Drug Setup  
Ampicillin

PRIMARY INFUSION

**RATE** 6 mL/h available: (2.5 mL)

VTBI **ALL**

Time Left: 00 h 25 min

DOSE = 100 mg/kg

[Conc]: 100 mg/mL

>Press START

**START**

Select RATE and,  
Enter rate of 6 mL/h  
& Press START

### 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 ( $3 \text{ mL} \times 2 = 6 \text{ mL/h}$ ).

Desired Delivery Time:	Multiply DOSE VOLUME by:
15 min	4
20 min	3
30 min	2
60 min	1
120 min	Divide by 2

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

8

Midtown Hospital  
NICU

**A** COMPLETE

**B**

**C**

**D**

VOLUME INFUSED

AUDIO ADJUST

After Infusion completes, medication remains in the med line. Remove syringe, replace with a flush syringe and program to deliver at the same rate.

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

1

**A Syringe Selection**  
BD 3 mL

>Confirm Syringe Size

ALL SYRINGES CONFIRM

Select & CONFIRM Syringe size/brand

2

**A Infusion Menu**

Guardrails Drugs  
Guardrails Fluids  
Basic Infusion

>Select an Option or Restore Previous Infusion

RESTORE EXIT

Select Guardrails Drugs

3

Guardrails Drugs  
NICU

Acydovir	A-E
Aminophylline	F-J
Amphotericin B	K-O
Ampicillin	P-T
	U-Z

>Select Drug

EXIT DRUG CALC PAGE COMB

Select Ampicillin

4

**A Guardrails Drug Setup**  
NICU

Ampicillin  
mg/mL  
was selected.  
Is this correct?  
DOSING UNITS mg/kg

Yes No

>Press Yes or No

Press Yes to confirm Custom concentration programming

5

**A Guardrails Drug Setup**  
NICU

DRUG AMOUNT 300 mg  
DILUENT VOLUME 3 mL  
PATIENT WEIGHT 3 kg  
DOSE = 100 mg/kg

[Conc]: 100 mg/mL

>Press NEXT to Confirm

DRUG LIBRARY NEXT

Enter DRUG AMOUNT, DILUENT VOLUME and PATIENT WEIGHT. Press NEXT to Confirm.

6

**A Guardrails Drug Setup**  
Ampicillin

PRIMARY INFUSION

RATE = mL/h available (3 mL)

VTBI ALL

DURATION h min

DOSE = 100 mg/kg

[Conc]: 100 mg/mL

>Select DURATION

RATE VOLUME SETUP

Select DURATION

### 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)

7

<b>A</b> Guardrails Drug Setup Ampicillin	
PRIMARY INFUSION	
RATE =	6 mL/h
VTBI	ALL available (3 mL)
DURATION	:30 hh:mm
DOSE =	100 mg/kg
[Conc]:	100 mg/mL
>Press START	
DELAY OPTIONS	RATE VOLUME
SETUP	START

Enter 30 minutes  
& Press START

### 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.

8

Midtown Hospital NICU	
<b>A</b> COMPLETE	
B	
C	
D	
VOLUME INFUSED	AUDIO ADJUST

After Infusion completes, medication remains in the med line. Remove syringe, replace with a flush syringe and program to deliver at the same rate.

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.

# Flushing Options

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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.

# Flushing Option 1 - RESTORE

1

Midtown Hospital  
NICU

**A** COMPLETE

B

C

D

VOLUME INFUSED AUDIO ADJUST

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

2

**A** Syringe Selection

BD 3 mL

>Select Syringe Size

ALL SYRINGES CONFIRM

Select BD 3 mL

3

**A** Syringe Selection

BD 3 mL

>Confirm Syringe Size

ALL SYRINGES CONFIRM

Press CONFIRM

4

**A** Infusion Menu

Guardrails Drugs

Guardrails Fluids

Basic Infusion

>Select an Option or  
Restore Previous Infusion

RESTORE EXIT

Press RESTORE

5

**A** Guardrails Drug Setup  
Ampicillin

DRUG AMOUNT 300 mg

DILUENT VOLUME 3 mL

PATIENT WEIGHT 3 kg

DOSE = 100 mg/kg

[Conc]: 100 mg/mL

>Press NEXT to Confirm

DRUG LIBRARY NEXT

Press NEXT

6

**A** Guardrails Drug Setup  
Ampicillin

PRIMARY INFUSION

RATE 6 mL/h

VTBI ALL available (3 mL)

Time Left: 00 h 30 min

DOSE = 100 mg/kg

[Conc]: 100 mg/mL

>Press START

DELAY OPTIONS VOLUME SETUP START

Select VTBI and  
enter 0.5 mL

## 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.

7

**A** Guardrails Drug Setup  
Ampicillin

PRIMARY INFUSION

RATE 6 mL/h (3 mL)

VTBI 0.5 mL ALL

Time Left: 00 h 05 min

DOSE = 100 mg/kg

[Conc]: 100 mg/mL

>Press START

DELAY OPTIONS VOLUME SETUP START

Press START

8

Midtown Hospital  
NICU

**A** Ampicillin 100 mg/kg

B

C

D

VOLUME INFUSED AUDIO ADJUST

## Note:

- Device will continue to scroll the medication name (Ampicillin).



## Flushing Option 2 – Guardrails Library

1

Midtown Hospital  
NICU

**A** COMPLETE  
B  
C  
D

VOLUME INFUSED AUDIO ADJUST

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

2

**A** Syringe Selection  
BD 3 mL

>Select Syringe Size

ALL SYRINGES CONFIRM

Select BD 3 mL

3

**A** Syringe Selection  
BD 3 mL

>Confirm Syringe Size

ALL SYRINGES CONFIRM

Press CONFIRM

4

**A** Infusion Menu  
Guardrails Drugs  
Guardrails Fluids  
Basic Infusion

>Select an Option or  
Restore Previous Infusion

RESTORE EXIT

Select Guardrails  
Fluids

5

**A** Guardrails Fluids  
NICU  
FLUSH  
IV Hep 0.5 units/mL  
Lipids 20%  
Platelets

A-E  
F-J  
K-O  
P-T  
U-Z

>Select IV Fluid

EXIT DRUG CALC PAGE DOWN

Select FLUSH

6

**A** Guardrails Drug Setup  
NICU  
FLUSH was selected.  
Is this correct?

Yes No

>Press Yes or No

Press YES to confirm  
FLUSH selection

7

**A** Guardrails Fluid Setup  
FLUSH  
PRIMARY INFUSION  
RATE 6 mL/h  
VTBI ALL available (3 mL)

>Press START

DELAY OPTIONS VOLUME DURATION START

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

### 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.

8

**A** Guardrails Drug Setup  
FLUSH  
PRIMARY INFUSION  
RATE 6 mL/h (3 mL)  
VTBI 0.5 mL ALL

>Press START

DELAY OPTIONS VOLUME DURATION START

Press START