Kingston General Hospital
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KINGSTON GENERAL HOSPITAL

Alaris® Infusion Pump

LEARNING GUIDE

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NOTE: This learning guide contains information current at the time of distribution. Policies and procedures are frequently revised. Please refer to related policies and procedures (11-210) contained in the Administrative Policy Manual for ongoing current information.

1.0 INTRODUCTION

The Alaris® Infusion pump contains the Guardrails® Safety Software that brings a new level of medication error prevention to the point of care. This learning guide is designed to provide health care professionals with information on how to correctly use the Alaris® Infusion pump technology. Installed on each Alaris® Infusion pump is a hospital-specific Data Set that includes Profiles, each of which is a unique set of configurations and practice guidelines for intravenous (IV) medication delivery for a specific patient population, i.e. Adult Critical Care, Adult Surgery/Medicine, Pediatrics (minimum 5 kg), Pediatrics (less than 5 kg), and NICU. These Profiles contain:

1. A Guardrails® Fluid Library (i.e. solution being infused).
2. A Guardrails® Medication Library (i.e. medication names, standard concentrations, minimum and maximum recommended infusion rates)
3. Configuration Settings (e.g. alarm settings, maximum patient weights, air-in-line settings, TKVO rates, pressure settings)
4. Clinical Advisories (reminds clinicians of the need for filters, monitoring, etc.)
5. Channel Labels (e.g. solution being infused, catheter location, etc.)

This information will facilitate safe and effective usage of the Alaris® Infusion pump.

1.1 Learning Objectives

The purpose of this learning guide is to provide the health care professional with an understanding of how to properly use the Alaris® Infusion pump. Upon completion of the manual, the health care professional will be able to:

1. Describe the major features of the Alaris® Infusion Pump and channels.

2. Correctly program the Alaris® Infusion pump for various types of infusions.

3. Correctly use the Guardrails® Medication Library for each medication being administered intravenously.

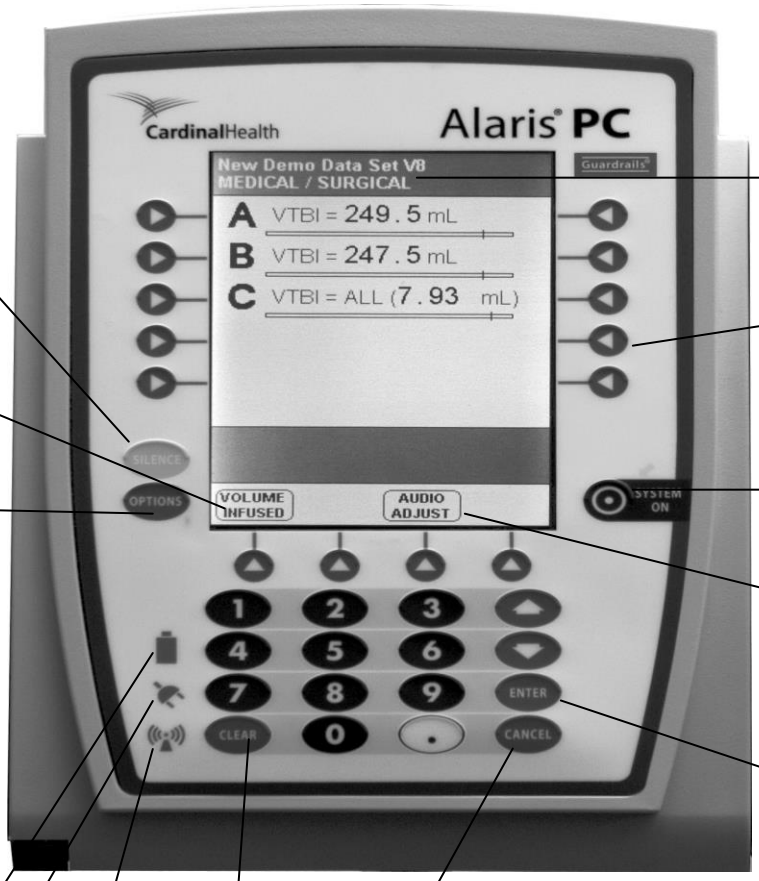
4. Understand the clinical advisories and the importance of incorporating this into patient care.

5. Demonstrate how to correctly connect and back prime secondary medication lines.

6. Describe how to properly clean and store the Alaris® Infusion Pumps.

7. Understand the necessary steps required for battery care and maintenance.

2.0 Alaris® Infusion Pump



SILENCE
Allows the alarm to be silenced for 2 minutes

VOLUME INFUSED

OPTIONS
Operates in two ways: System options are accessed by pressing **OPTIONS** while at the main screen; channel specific options are accessed by pressing **OPTIONS** while in a channel screen (after pressing **CHANNEL SELECT**).

Battery Indicator

Power Indicator

Wireless Network Indicator

CLEAR
Clears current selected parameter setting to zero.

CANCEL

Pole Clamp

Tamper-resist button
When activated this locks the key panel but still allows the clinician to:
-silence the audio alarm;
-view the volume infused;
-view and test the audio alarm setting.

PATIENT PROFILE

SOFT KEYS

SYSTEM ON
Turns the unit on.

AUDIO ADJUST
Allows the volume of the alarm to be adjusted.

ENTER

2.1 Alaris® Pump Features

Audio Adjust (Alarm Volume)
This key allows the health care professional to change the volume from a 1-5 (quiet to loudest in numerical fashion) setting for volume of the alarm. Select Audio Adjust, set volume and press Main Screen.

Silence Feature
The silence key can be pressed during an alarm, and will silence the audio for 2 minutes.

Tamper Resistant Switch
The Tamper Resistant Switch is a small black switch located on the back side of the pump on the lower left side. Press and hold Tamper Resist button (3 seconds). Note: Main screen confirms **"PANEL LOCKED"** when key is pressed. **To Unlock Panel** press and hold Tamper Resist button (3 seconds). Note: Main screen confirms **"PANEL UNLOCKED"** and an advisory tone will confirm Tamper Resistant feature is off

When activated, the key panel is locked but will still allow the health care professional to silence the audio alarm, view the volume infused and view and test the audio alarm setting.

Volume Infused Feature
Volume Infused appears on the System Main screen when a medication or IV fluid is infusing. Selecting the **Volume Infused** feature allows the health care professional to see the exact amount of fluid each channel has administered, including the date and time it was last cleared.

CLEAR Feature
When viewing the volume infused screen the clinician can choice to **CLEAR** "all" amounts or he/she can select a **CHANNEL** and then choose volume infused and use the **CLEAR** key only the amount that channel has delivered. The **CLEAR** feature also allows the health care professional to delete any number entered accidently while programming the pump.

OPTIONS key
The **OPTIONS** key when pressed, allows access to available System or Channel Options. To access System options-press **OPTIONS**. To access channel options – Press **CHANNEL SELECT**, then press **OPTIONS**.

CANCEL key
Sequentially backs out of the current setup sequence.

ENTER key
Confirms current parameter entry.

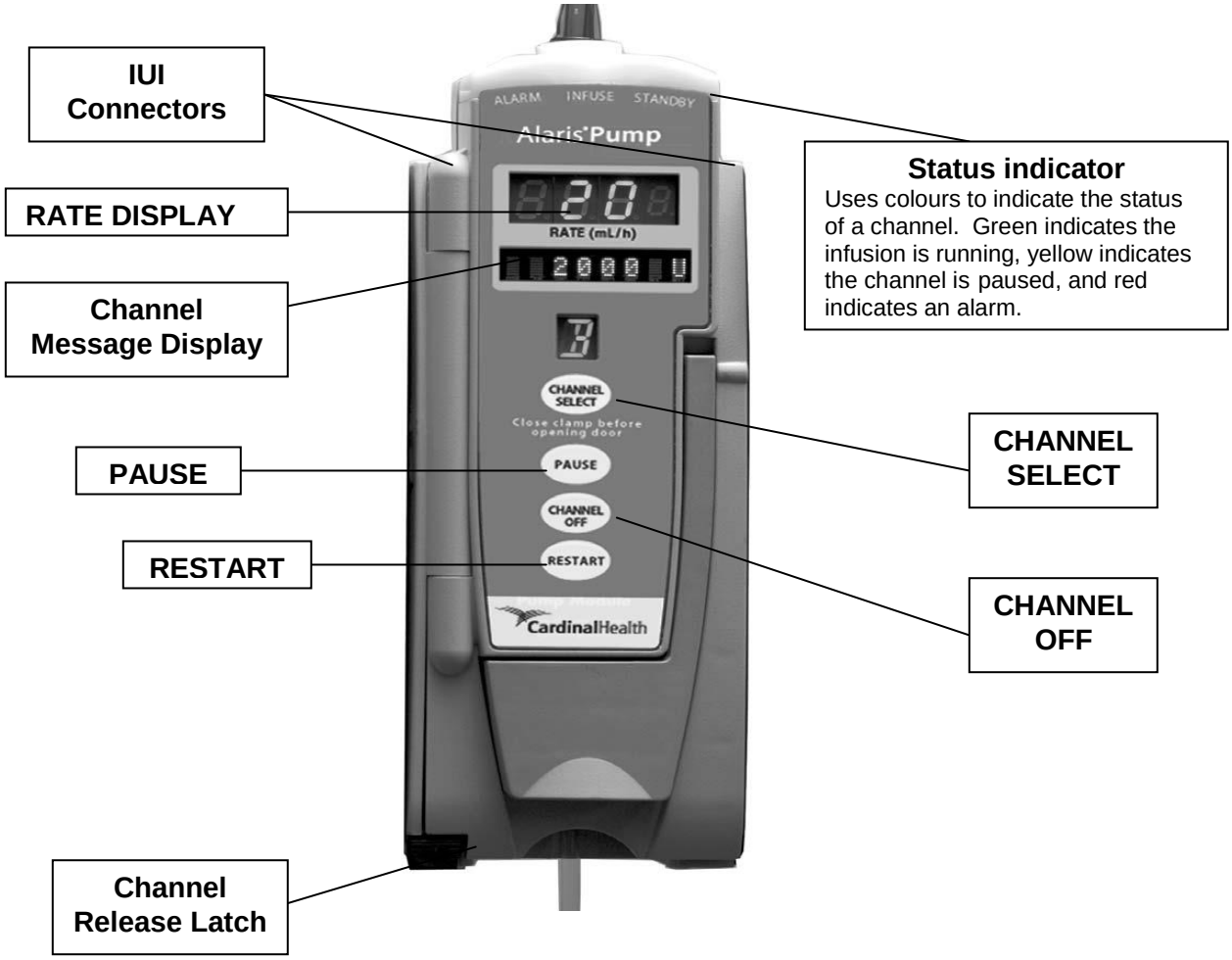
Battery Indicator
When illuminated, indicates Alaris® system is operating on battery power.

Power Indicator
When illuminated, indicates Alaris® system us connected to an AC power source.

Wireless Network Indicator

When illuminated, indicates Alaris® system is connected to Alaris® Server or Mobile Systems Manager. When blinking, indicates data transfer.

2.2 Alaris® Pump Channel (Module)



2.2.1 Attaching and Detaching a Channel from the Alaris® Infusion Pump

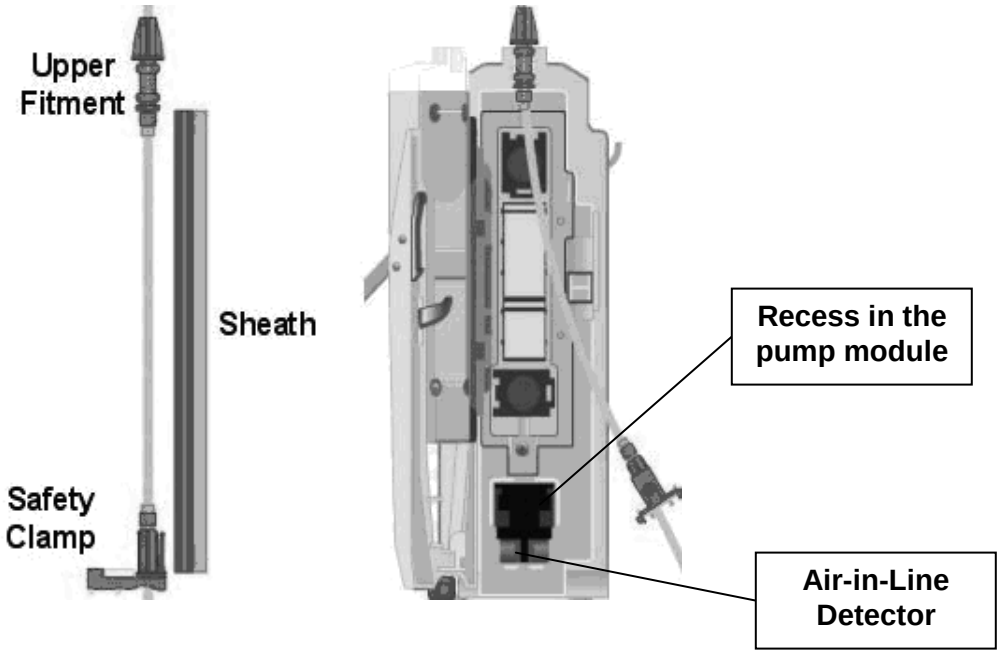
The Alaris® Infusion Pump is designed to operate a maximum of four infusion or monitoring channels. Channels added in excess of four are not recognized by the system.
A channel can be attached in any position; however, when mounted on an IV pole, it is recommended that a balanced configuration be maintained. Application of adhesive tape or other materials to the sides of the brain and channels can prevent proper latching.

To Attach: Position free module at a 45° angle, aligning IUI connectors.
Rotate free channel down against Alaris® Infusion pump or attached channel, until release latch snaps in place.

When properly secured/snapped, the **release latch** provides a very secure connection between channels. If not properly latched, a channel can be dislodged during operation.

To Detach: Ensure that channel is powered off before detaching. Push channel release latch and then rotate channel up and away from Alaris® Infusion pump or attached channels to disengage connectors.

3.0 Administration Set Loading Instructions



-Once the administration tubing has been primed, remove the sheath and insert the upper fitment before installing safety clamp fitment.

-Ensure the tubing is not twisted.

-Firmly press the safety clamp fitment into the recess in the pump module. Firmly press tubing into the Air-in-Line Detector.

-Note: To prevent free flow of fluid, the roller clamp is the primary safety mechanism and should always be used. The safety clamp is the secondary safety mechanism to prevent free flow.

4.0 Start Up and Powering Down of the Alaris® Infusion Pump

When starting up the Alaris® infusion pump connect the unit to an external AC power source.

Press the **SYSTEM ON** key and the screen will light up and the system self test begins. All LED display segments and status indicator lights of attached channels illuminate briefly, the power indicator illuminates and appropriate channel identification is displayed on the attached channel(s). An audio tone sounds and at the completion of the system–on test, **New Patient?** screen appears.

To power down one channel and leave the others running, press the **CHANNEL SELECT** key on the channel you wish to turn off and press the **CHANNEL OFF** key. Hold for 2-3 seconds and the channel will power down. (Note: if you have only one channel infusing on the Alaris® Infusion pump and select the **CHANNEL OFF** key the pump will power down completely.)
To power down all channels at the same time – press the **OPTIONS** key and press **Power Down All Channels** key. The pump will ask you if you wish to "**Power Down All Channels**", press "**Yes**" and "**POWERING DOWN**" will flash on the Main Display screen.

5.0 Programming the Alaris® Infusion Pump for a Continuous IV Fluid Infusion

Prime administration set tubing prior with ordered solution and insert into Alaris® Infusion pump (leaving the roller clamp closed until programming of pump is completed).

**The option of basic infusion should only be used if the Guardrails® IV Fluid library does not contain the IV fluid the health care professional needs to infuse. The basic infusion does not offer the safety of the Guardrails® IV Fluid library. **

Turn Alaris® Infusion pump on –press **SYSTEM ON** key.

Follow the prompts:

NEW PATIENT? **Yes –** indicates a new patient and clears all previously stored data.
No – indicates programming is for the same patient and retains all stored patient parameters.

↓

Accept or change current profile
The current profile will appear (i.e. Adult ICU, Adult Surgery/Medicine etc)
If the current profile is correct – press **Yes**.

If the profile needs to be changed – press **No** and the profile selection screen will appear.
Select the profile that suits the patient and then press **CONFIRM**.

↓

CHANNEL SELECT
Choose the channel you have the administration set in (note: the Alaris® Infusion pump has the capacity to have 4 channels maximum).

↓

Press **Guardrails® IV Fluid** key
Select the desired fluid (i.e. Normal Saline, 2/3 & 1/3)
And push**Yes**.

↓

Press **RATE**
Enter the prescribed rate.

↓

Press **VTBI**
Enter the desired volume to be infused (VTBI).

↓

Press **START**.

5.1 Programming infusion with Guardrails® IV Fluid over time

When a patient requires an IV fluid infusion that has a specific time to infuse the Volume/Duration feature allows the volume to be infused (VTBI) and duration (infusion time) to be programmed. When this feature is used the flow rate is automatically calculated.

Select **CHANNEL**.

↓

Press **Guardrails® IV Fluids** key.

↓

Locate and select Guardrails® IV fluid.

↓

If selection is correct, press **Yes**.

↓

Select **Volume Duration**.

↓

Enter **VTBI**
Enter **DURATION**.

↓

The rate is automatically calculated, press **START**.

6.0 Programming the Alaris® Infusion Pump for a Continuous Medication Infusion in the Guardrails® Drug Library

****Note:** Medications that exist in the Guardrails® Medication library are Patient Profile specific. The option of basic infusion should only be used if the Guardrails® Medication library does not contain the medication required.

CHANNEL SELECT
Choose the channel you have the administration set in.

↓

Press **OPTIONS** key.

↓

Press **Guardrails® Drugs** key.

↓

Press key next to desired drug (note: to locate a drug, use the alphabetical soft keys on the right or scroll through the list using **PAGE DOWN** or **PAGE UP**. The generic drug names are used in the Guardrails library).**

↓

Select preset drug concentration or blank concentration.

↓

Verify selected concentration and press **Yes**.

↓

If selecting blank concentration enter **DRUG AMOUNT** and **DILUTENT VOLUME**
(Enter weight or BSA if required).

↓

Press **NEXT** to confirm.

↓

Select and program **RATE** or **DOSE** and then program **VTBI**.

↓

Press **START**.

6.1 Programming and Titration of an Infusion with the Guardrails® Drug Library

When a medication has been ordered to infuse as a continuous infusion and requires titration- follow the above steps in 6.0 Programming the Alaris® Infusion Pump for a Continuous Medication Infusion, then:

Press **CHANNEL SELECT** when needing to titrate⟶ Press **DOSE**, and key in dose⟶Press **START**.

6.2 Programming the Alaris® Infusion Pump for a Continuous Medication Infusion NOT in the Guardrails® Drug Library

The following procedure should be used only when the drug to be infused is not listed in the Guardrails® Drug Library. When programming a drug not listed in the Guardrails® Drug Library, the drug calculation must be programmed using the **DRUC CALC** key within the **Drug Library**. There are no limits associated with any non-library drug calculation.

Press **CHANNEL SELECT**

↓

Press **Guardrails® Drugs**

↓

After confirming the drug ordered is NOT in the library select **DRUG CALC**

↓

Enter **DRUG AMOUNT** using numerical keys

↓

Select appropriate **unit of measure** for drug amount.

↓

Enter **DILUENT VOLUME**, using numerical keys.

↓

Press **PATIENT WEIGHT** key.

↓

Indicate whether or not weight is to be used by pressing **Yes** or **No**.

↓

Enter patient weight (if required) in kilograms, using the numerical keys.

↓

Press **TIME UNITS** key.

↓

Select time base for drug calculation, press **Min**, **Hour**, or **Day** key.

↓

Press **DOSING UNITS** key and select appropriate unit.

↓

Verify correct infusion parameters and press **NEXT** key.

↓

Select and program **RATE** or **DOSE** and then program **VTBI**, using numerical keys.

↓

Verify correct parameters and press START key.

7.0 Administering a Secondary Piggyback Infusion using Guardrails® Drug Library

When connecting the secondary medication set to the primary infusion line on the Alaris® Infusion pump, cleanse the SmartSite® needless valve port on the primary infusion line with a sterile 70% isopropyl alcohol wipe (for 1-2 seconds) and allow to dry (for approximately 30 seconds). Connect the male luer lock end of the secondary medication set directly to the SmartSite® needless valve port. Do not use needles or lever lock cannulas (cannula found in the secondary medication set packages). These cannulas can cause the SmartSite® needless valve not to open completely or puncture the valve itself and cause it to leak.

Program the primary infusion as explained in 5.0 of the learning guide and then press

CHANNEL SELECT key.

↓

Press **SECONDARY** key.

↓

Press key next to desired secondary drug (note: to locate a drug, use the alphabetical soft keys on the right or scroll through the list using **PAGE DOWN** or **PAGE UP**. The generic drug names are used in the Guardrails® library).**

↓

Select preset drug concentration or blank concentration (i.e. ___mg/mL),
and if selection is correct
press **Yes** key.

↓

If selecting blank concentration enter **DRUG AMOUNT** and **DILUTENT VOLUME**
(Enter weight or BSA if required)

↓

If setup is correct, press **NEXT** key.

↓

Select and program **RATE** or **DOSE** and then program **VTBI (VTBI = minibag + drug dilutent)**
(If wishing to clarify the rate: enter **duration** and **VTBI** and this will calculate the **RATE**).

↓

Press **Enter** to confirm.

↓

Note: Secondary prompt "**Verify secondary clamp is open, then press START**" appears; if the clamp is not opened, the fluid will be delivered form the primary container.

↓

Press **START** key.

Note: If the secondary drug does not exist in the Guardrails® Drug library press **BASIC SECONDARY key and then select **RATE** and **VTBI**. The clinical resource to help determine the appropriate rate is found in the HDH/KGH Parental Drug Therapy Manual.

7.1 Secondary Infusions: Back-Priming Technique

The back priming technique can be used when initially setting up a secondary line or prior to administering another medication through the secondary line hanging.

Suspend the primary IV bag with the hanger provided in the secondary medication set package.

↓

Prepare the secondary medication bag/bottle, close the roller clamp on the secondary tubing and spike the secondary bag/bottle. (**Note: If it is a glass bottle or a semi-rigid container squeeze the drip chamber while spiking the bag to prevent the vent form becoming wet.)

↓

Use the appropriate antiseptic to swab the top of the Y-site port on the primary tubing, which contains the SmartSite® needless valve. Attach the secondary line directly to the port.

↓

Lower the secondary bag/bottle to a level below the primary IV bag.

↓

Open the clamp on the secondary tubing.

↓

Keep the secondary bag/bottle vertical, all the fluid to back prime from the primary IV bag into the secondary tubing.

↓

Close the roller clamp after the secondary tubing is primed and the drip chamber is 2/3 full.

↓

Raise the secondary medication bag/bottle and hang it above the primary IV solution.

↓

Open the vent on the drip chamber if the secondary container is glass or semi-rigid.

↓

Program the pump for a secondary infusion.

7.2 Stopping the Secondary Infusion and Resuming the Continuous IV Solution

If the secondary medication that is infusing needs to be interrupted you can stop the secondary medication and resume the primary infusion.

To interrupt a secondary infusion and resume the initial programmed primary infusion:

Select appropriate **Channel** key.

↓

Close the secondary roller clamp.

↓

Press **SET UP** key.

↓

Push the **Primary** key.

↓

Press **Start**.

↓

Stop Secondary and infuse Primary prompt will appear-Press **Yes**.

↓

The primary screen will reappear, and the primary infusion will begin to infuse.

**** NOTE**: If the patient is experiencing an adverse reaction a new IV tubing and solution should be hung.****

8.0 Hard Limit & Soft Limit Features for the Guardrails® Drug Library

Soft Limit Feature:

The soft limit feature is a safety feature to inform staff that the drug is above the usual dose, but within acceptable hospital established Guardrails® limits.

When a Soft Guardrail® infusion rate limit is encountered, the health care provider administering the medication:

- verifies that the correct Patient Profile and medication have been selected, and that the correct dose has been entered;
- Considers whether the verified order is clinically appropriate (consults with others as necessary);
- If deciding that the order is clinically appropriate, overrides the Soft Guardrail® limit.

An audio alert sounds on the Alaris® Infusion pump and the screen will show the following message:

Dose exceeds Guardrails® limit of ### unit/h.
Proceed?

If the drug is ordered and clinically appropriate the provider can press **Yes** and the soft limit feature is overridden, the main screen will then display a **G** and the Message Display also shows either "**LLL**" for a low dose or "↑↑↑" for a high dose.

When the **G** key is pressed, all applicable out-of-range limits are listed.

Hard Limit Feature:

The hard limit feature helps to avoid medication errors by not allowing a rate or dose that exceeds the hospital's established parameters for that drug.

When a Hard Guardrail® infusion rate limit is encountered, the health care provider administering the medication:

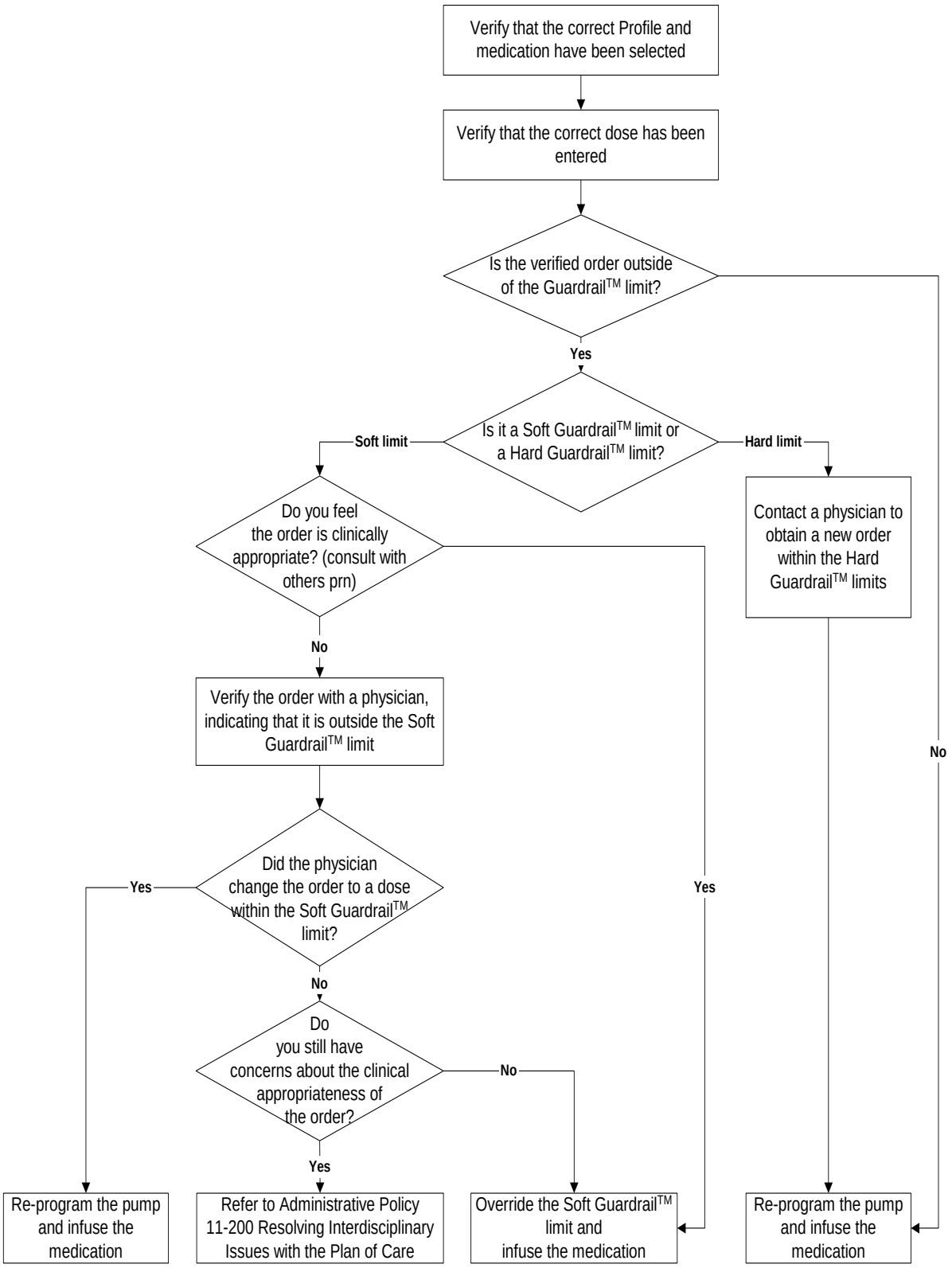
- Verifies that the correct Patient Profile and medication have been selected, and that the correct dose has been entered.
- If the verified order is still outside of the Hard Guardrail® limit, contacts a physician to obtain an order that is within the Hard Guardrail® limits and re-programs the pump.

An audio alert sounds on the Alaris® Infusion pump and the screen will show the following message:

Dose exceeds Guardrails® Hard Limit of ### unit/h.

This requires the provider to select **Reprogram** and enter an acceptable value.

8.1 Responding to Guardrails® Limits



9.0 Medication Infusion with a Custom Concentration

When using the Guardrails® Drug Library, the medication you require may be available but the concentration may be patient specific and the standard concentration can not be used. Follow these steps:

Press and hold on the **CHANNEL OFF** key for the channel you wish to use (if it is already running) for two or three seconds, or until you hear the audible beep.

↓

Select the same Channel.

↓

Press the **Guardrails® Drugs** key.

↓

Locate and select Guardrails® drug.

↓

Select ___**mg/**___**mL**

↓

Press **Yes**.

↓

Press **DRUG AMOUNT** and enter amount using numerical keys.

↓

Press **DILUTENT VOLUME** and enter amount using numerical keys.

↓

Press **NEXT** to confirm.

↓

Enter **DURATION**.

↓

Press **START**.

10.0 Bolus Dose

A bolus dose from the Alaris® Infusion pump decreases the need to prepare and hang a secondary line when the medication is already infusing and available in the main line.

When a provider wishes to bolus a medication from the continuous intravenous medication infusion the following steps need to be followed.

The bolus dose option appears on the Continuous Infusion screen when a **VTBI** is entered, or if the medication is infusing select **CHANNEL SELECT**

↓

Press **Bolus** key.

↓

Use numeric keys to enter the desired bolus dose.
(This value may be pre-populated and edited if appropriate)

↓

Press key next to appropriate unit of measure (i.e. **mg** or **mcg**).
If **mcg/kg** or **mg/kg** is selected as dosing unit, a **patient weight** entry is required.

↓

Press **DURATION** key and use numeric keys to enter.
(This value may be pre-populated and edited if appropriate)
Or press **Rapid Bolus** key.

↓

If **Rapid Bolus** is selected, the dose entered will be infused at the hospital-established fastest rate for that medication and that dose.

↓

Verify correct parameters and Press **START** key.

↓

To see details during bolus infusion, press **CHANNEL SELECT** key.

11.0 Delay Options & Callbacks

The delay option allows you to pause an infusion (for more than the allotted two-minute pause) when needing to draw blood or change an IV bag. The delay feature can pause an infusion for up to 120 minutes (i.e. continuous IV medication infusion requires a 60 minute hold e.g. heparin).

The primary infusion can be programmed to be delayed for a specified period of time and a callback can be scheduled. The delay until option is used to program an infusion delay for a minimum of 1 minute up to 23 hours and 59 minutes.

11.1 To delay an infusion by minutes:

Press **CHANNEL SELECT**

↓

Press **DELAY OPTIONS** key on Main Display screen.

↓

Press **Delay for** key.

↓

Enter number of minutes the infusion is to be delayed for using the numeric data entry keys.

↓

Press **CONFIRM** key.

↓

Delay period counts down on the Main Display screen.

11.2 To delay an infusion by time of day:

Press **DELAY OPTIONS** key on Main Display screen.

↓

Press **Delay until** key.

↓

If **Current time** displayed is correct, press **CONFIRM** key; otherwise, press **Change Time** key and enter correct time.

↓

To enter time of day infusion is to be initiated (up to 23 hours and 59 minutes), use numeric data entry keys.

↓

Press **CONFIRM** key.

↓

Time infusion is scheduled to start appears on Main Display screen.

11.3 Schedule a Callback

When programming a delay, a callback can be scheduled for that infusion. There are three types of callback:

Before – Gives an alert when delay period is completed and infusion needs to be initiated.

After – Gives an alert when delayed infusion has been completed.

Before and **After –** Gives an alert when delay period is completed and infusion needs to be initiated and when the delayed infusion has completed.

11.4 Programming a Callback

Prior to pressing the **CONFIRM** key to initiate delay during the **Delay for** or **Delay until** programming process.

↓

Press the **CALL BACK** key.

↓

Choose the desired callback option and press the corresponding key.

↓

Press **CONFIRM** and the delay will be initiated along with the selected callback.

If the **Before** option was selected – an audio prompt sounds when the delay period has ended, a yellow standby status indicator flashes and **DELAY COMPLETE** scrolls in the message display and appears on the Main Display screen. The **RESTART** key needs to be pressed to resume the infusion and silence the audio prompt.

If the **After** option was selected – an audio prompt sounds when the delayed infusion is completed and continues to sound until responded to. The yellow standby status indicator flashes until the audio is silenced; and the infusion completed message appears on the Main Display screen. **CONFIRM** needs to pressed to silence the audio prompt.

If the **Before** and **After** option was selected – The same prompts and indicators mentioned above for both options are exhibited.

12.0 Added Features of the Alaris® Infusion Pump

Restore Feature

The Restore feature can simplify programming, and can be used to recall previous rate and volume settings for the same patient.

When the programmed VTBI reaches '0' the Alaris® Infusion Pump module scrolls **INFUSION COMPLETE-KVO**, press **Channel Select** and then Press **Restore** on the Main Display screen; the previous entered rate and VTBI will appear.

This option is only available if the patient is not new and the system is powered up within 8 hours of last usage.

Free Flow Protection

All Pump Module/Gemini Infusion System administration sets utilize a unique clamping device to prevent inadvertent free-flow when the administration set is removed from the channel as a secondary safety measure to the roller clamp.

KVO(Keep Vein Open) Rate Adjust

Used to select KVO rate (0.1-20mL/h allowed), which is the rate of fluid flow after an "Infusion Complete" occurs. KVO rate never exceeds infusion rate. The KVO rates are pre-set on the Alaris® Infusion pump to correspond with the patient profile selected and can not be changed by staff.

13.0 Troubleshooting

Alarm/Error	Meaning	Response
Accumulated Air-in-Line	A large number of air bubbles smaller than the current Air-in-Line limit has recently passed the detector.	1. Clear air from the line. 2. Press **RESET** to continue the infusion. 3. Press **RESTART**.
Air-in-line	Air has been detected in the administration set during an infusion. Infusion stops on the affected channel.	1. Ensure that the tubing is properly installed in the Air-in-Line detector. 2. If air is present, clear the air from the administration set. 3. Press **RESTART** or **CHANNEL SELECT**. 4. Press **START**.
Channel Disconnected	Channel(s) disconnected while in operation or a communication problem.	1. Press **CONFIRM** to silence alarm and clear message from screen. 2. Reattach channel, if desired, ensuring it is securely “clicked” into place at the channel release latch. 3. If alarm is still present, replace channel with another operational channel. 4. If unable to reattach channel, send channel and Alaris® Infusion Pump to Clinical Engineering.
Check IV Set	The administration set is not properly installed. Infusion stops on the affected channel.	1. Close the roller clamp. 2. Remove and reinstall the administration set. 3. Close the door, reopen the roller clamp, and press **RESTART**.
Checking Line	Patient-side occlusion occurred; Auto-Restart feature monitoring downstream pressure to determine if infusion can continue.	NONE
Close Door	The door was opened during an infusion, and the infusion stops on the affected channel.	1. Close the door. 2. Press **RESTART** or **CHANNEL SELECT**. 3. Press **START**.
Occluded – Fluid Side/ Empty container	Indicates that there is either an upstream occlusion or an empty container. Infusion stops on the affected channel.	1. Clear the occlusion on fluid side of the pump. 2. If necessary refill the drip chamber. 3. Press **RESTART** or **CHANNEL SELECT**. 4. Press **START**.

Alarm/Error	Meaning	Response
Occluded – Patient Side	Increased back pressure was sensed while infusing in pump delivery mode. Infusion stops on the affected channel.	1. Clear the occlusion. 2. Press **RESTART** or **CHANNEL SELECT**. 3. Press **START**.
Partial Occlusion Patient Side	Partial occlusion of the patient side of the IV line was detected by the auto restart feature.	1. Clear the occlusion. 2. Press the **RESTART** or **CHANNEL SELECT**. 3. Press **START**.
Pump chamber Blocked	The tubing is blocked inside the pump chamber.	1. Close the roller clamp and open the door. 2. Remove the tubing. 3. Massage the tubing from top to bottom to restore the flow. 4. Reload the set and close the door. 5. Press **NEXT**. 6. Press **CONFIRM**. 7. Open the roller clamp and press **RESTART**. 8. Verify the flow in the drip chamber after restarting the infusion. 9. Change the tubing if you are unable to establish flow.
Safety Clamp Open – Close Door	The safety clamp device is in the open position while the door is open.	Close the roller clamp ion the administration set or close the door.
Restart Channel	The door was opened and closed during an infusion. The infusion stops on the affected module. The module pauses for 2 minutes.	1. Close the door. 2. Press **RESET** and **RESTART**. 3. Press **RESTART** or **CHANNEL SELECT**. 4. Press **START**.
Display Contrast	Main screen display is too light/dark.	1. Press **Display Contrast**. 2. To adjust the display for optimum viewing, press **Lighter/Darker**. 3. Press **CONFIRM** to return to the main screen
Very Low Battery	The battery has five minutes or less of power at the current power consumption rate before operation stops.	Connect the AC power cord to the power source (alarm silenced).
System Error	An error was detected on the Alaris® Infusion pump. Operation continues on all attached modules (channels).	1. To continue temporary operation, press **SILENCE**. 2. Replace Alaris® Infusion pump with an operational unit and send to clinical

Alarm/Error	Meaning	Response
		engineering for repair.
Channel Error	An error was detected. Operation stops on the affected module (channel).	1. To silence the alarm and continue operation of the unaffected module(s), press **CONFIRM**. 2. Replace the module (channel) with one that is operational. 3. Send module (channel) to clinical Engineering for repair.

14.0 Cleaning and Care of the Alaris® Infusion Pump and Channels

- Inspect the infusion pump for visible external damage, such as a cracked or broken door, case handle or latch or a damaged IUI connector.
- If damage is noted, clean the pump and send to clinical engineering for repair. (This can be done by calling the Equipment Coordinator on Vocera, Monday-Friday 0700-1500h.
- Turn the Alaris® infusion pump off and unplug the power source before cleaning and remove channels.
- Keep the pump upright and do not allow any part of the pump or channels to become saturated with or submersed in fluid when cleaning.
- Use the Super Sani-Cloth to wipe off the pump and channel(s). Remove the channels from the pump in order to clean all surfaces thoroughly.
- Allow the pump to dry before re-attaching the channel. (Dry time is dependent on the environment temperature, humidity and ventilation; a minimum of a 5 minute wait time is required for the disinfectant property of the Super Sani-Cloth to be effective.
- When cleaning the IUI connectors and surface contaminants are visible, or blue or green deposits are visible, the connector must be replaced. (Send to Clinical Engineering).
- There are shelves in each unit's dirty utility room for the pumps to be placed on when they are no longer in use and require cleaning. They are **not** to be placed in the blue boxes in the utility rooms.
- Once the pump has been cleaned, it needs to be removed from the dirty utility room and placed on the equipment cart on the unit and **plugged in**.

15.0 Battery Care & Maintenance

The Alaris® Infusion Pump is equipped with a 12 volt, 4000 mAh nickel metal hydride battery. The life expectancy of the battery is dependent on the amount of use, the depth of discharge, and the state of the charge that is maintained. Generally, the battery has the longest life if the pump is plugged in and battery use is infrequent. Frequent use of battery power and insufficient battery charge cycles significantly decrease the life of the battery.

When the "**REPLACE BATTERY**" message appears this is letting the health care provider know that the pump will operate on battery but for a much, much shorter period than normal.

(**NOTE: the lines on the screen indicate the screen requires replacing, this is also handled by Clinical Engineering.)

When this message appears the Equipment Coordinator should be notified on vocera so that a replacement pump can be brought to the unit and this pump taken to Clinical Engineering for a battery replacement.

Other battery messages that can appear:

Battery Discharged – plugging in to an AC outlet should rectify this message –All channels that are running will stop but can be resumed after plugging in.

Defective Battery – pressing the silence key will allow temporary operation, the pump should be sent to Clinical Engineering immediately.

16.0 Frequently Asked Questions & Answers

Q The pump is in ANESTHESIA MODE, how do I disable that feature?

A The Anesthesia Mode can be disabled, and normal operation resumed, using any of the following three methods:

1. Press **OPTIONS** key ⟶ press **ANESTHESIA MODE** key ⟶ Press **DISABLE** key ⟶Press **CONFIRM** key.

2. Connect system to AC power; the Main Screen display will prompt the clinician to select "Continue **ANESTHESIA MODE**?" Press **NO** to discontinue.

3. Disconnect system from AC power. Anesthesia Mode is automatically disabled. All currently running infusions continue. A prompt appears as an alert that Anesthesia Mode has been disconnected. Press **CONFIRM** key

Q Why can I not just use the "basic" option for all my IV solutions or medication administrations? It's just quicker.

A The Alaris® Infusion Pump is programmed with the Guardrails® Medication and IV Fluid Libraries to enhance patient safety and help prevent errors in medication administration. The health care professional is responsible and accountable to ensure all steps are taken to reduce patient risk. The College of Nurses (CNO) standards advocate for adequate resources and systems that facilitate safe, effective administration of medication according to standards; the Guardrails® Drug library is one of these resources.

Q Do I have to turn the Alaris® Infusion Pump off if I want to change a basic infusion to a Guardrails® IV fluid or medication?'

A No. If a basic infusion has been started and the IV fluid or the drug is in the Guardrails® library, the IV fluid or medication should be changed on the Alaris® Infusion Pump for patient safety.

Press **CHANNEL SELECT** on the basic infusion channel ⟶Press **OPTIONS**⟶Select Guardrails® drugs or IV fluid⟶Select and confirm the drug or solution required ⟶Verify the settings and press **NEXT** to confirm⟶The **VTBI** programmed from the basic Infusion resumes ⟶Program the dose(for medication). ⟶Press **START** (the drug name or IV fluid name now scrolls on the Channel Message Display).

17.0 References:

CareFusion. (2010). Alaris System Implementation. *Learner's Workbook*, Kingston General Hospital, Kingston, ON

CareFusion. (2009) *Directions for use: Alaris system.* San Diego, California.

College of Nurses of Ontario, (CNO). (2009). Practice standard: medication revised, 2008 Retrieved from http://www.cno.org/Global/docs/prac/41007_Medication.pdf

18.0 Alaris® Infusion Pump Self Test

1. What types of patients must have an Alaris® Infusion pump to administer intravenous fluids and medication, regardless of the IV solution?

    a) All patients with central lines
    b) All pediatric patients
    c) All patients receiving a mainline IV fluid with D5W
    d) a,b

2. Which of the following is true about selecting a Patient Profile on the Alaris® Infusion pump?

    a) The clinician must check that the correct profile is in use at the beginning of each shift and when a patient is transferred to his/her care.
    b) The clinician must check that the correct profile is in use only when administering a secondary medication.
    c) The clinician does not have to check that the profile in use when running a basic infusion.
    d) It is the initial clinician who starts the Alaris® Infusion pump that is responsible for ensuring the profile is correct.

3. To ensure the longest battery life for the Alaris® Infusion pump it should be plugged in:
    a) When the 'Low Battery' message appears.
    b) When ever possible, including when it is not in use.
    c) When the battery Run Time displayed is less than 30 minutes.

4. When the Alaris® Infusion pump is cleaned with the Super Sani-Cloth between patient uses, the minimum wait time to ensure adequate disinfecting ability of the cleaning agent is:
    a) 30 seconds
    b) 1 minute
    c) 3 minutes
    d) 5 minutes

5. When the Tamper Resist button is activated the clinician can still:
    a) Silence the audio alarm.
    b) View volume(s) infused.
    c) View and test audio alarm setting.
    d) All of the above.

6. The following are all correct for the 'Delay Options' on the Alaris® Infusion pump **except**:
    a) Can only be programmed prior to the initiation of an infusion.
    b) Can be programmed as a specific number of minutes or for a specific time of day.
    c) Allows a callback to be scheduled if the clinician wishes.
    d) The Pause option also appears under the Delay Options.

7. When connecting a secondary medication set to the primary IV tubing the best technique is to:
    a) Use the lever lock cannula provided in the secondary package.
    b) Use a threaded lock cannula
    c) Use no adapter; attach the secondary line directly to the Smartsite® needless injection port on the mainline.

8. When a secondary medication set is connected to the mainline it can be used to administer more than one medication if the medications are compatible and back-priming is done.

    TRUE FALSE

9. The Guardrails® Safety Software on the Alaris® Infusion pump defines the minimum and maximum infusion rate limits and the minimum and maximum recommended concentration limits of medications.

    TRUE FALSE

10. The Alaris® Infusion pump contains Hard Guardrails® limits for medications. These Hard Guardrails® cannot be overridden during pump programming.

    TRUE FALSE

19.0 Alaris® Infusion Pump Self Test Answers & Rationale

1. **d** The decision to use a pump to administer a medication is per administrative or discipline-specific policy, or based on clinical discretion. As per KGH policy requires all pediatric patients and patients with central lines to receive IV therapy via an infusion pump.

2. **a** The health care professional must check that the correct profile is in use at the beginning of each shift and when a patient is transferred to his/her care.

3. **b** The battery has the longest life if the pump is plugged in and battery use is infrequent. Frequent use of the battery power and insufficient battery charge cycles significantly decrease the life of the battery

4. **d** The Super Sani-Cloth is safe for cleaning the Alaris® Infusion pump and must be allowed a wait time of 5 minutes minimum to be effective at disinfection.

5. **d**

6. **a** The Delay option can be programmed at the beginning of an infusion or during an infusion.

7. **c** The SmartSite® needless valve port on the primary infusion line is designed to be a needle-free valve, the use of a firm cannula or needle can result in the valve not opening correctly and/or result in a puncture and cause leaking.

8. **TRUE**

9. **TRUE**

10. **TRUE**

20.0 Authorized Self Appraisal of Competency Statement

To be completed by Designated Staff

I have the knowledge, skill and ability to utilize the Alaris® Infusion pump with the Guardrails® Drug and IV Fluid Libraries.

Name: _____
(Printed)

Signature: _____
(Include professional designation)

Date: _____/_____/_____
YYYY MM DD

Please return the completed self appraisal of competency statement to your Manager/Designated Educator.

To be completed by Manager/Designated Educator

I have received the completed staff-appraisal of competency statement.

Manager/Designated Educator Signature: _____

Date: _____/_____/_____
YYYY MM DD

Distribution:
Original: Designated Staff
Copy: Educator

21.0 EVALUATION OF LEARNING GUIDE

Your feedback and comments are most appreciated. Thank your for your time in responding to this questionnaire. It will help us in planning/revising learning materials.

Please circle appropriate response:

	Strongly agree				Strongly disagree
1. The content was clear and easy to understand. Comments:	1	2	3	4	5
2. The content was relevant. Comments:	1	2	3	4	5
3. I feel that my learning needs were met. Comments:	1	2	3	4	5
4. This guide will help me to meet the knowledge/skill requirements to utilize the Alaris® Infusion pump. Comments:	1	2	3	4	5

Additional comments/suggestions re learning program:

Please return completed evaluation to your Clinical Instructor. Thank you.