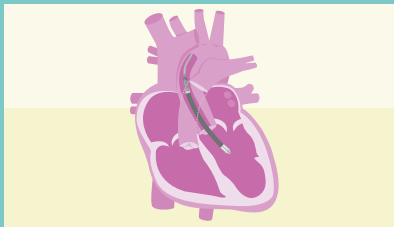


# Impella® Left CP & 5.5 with SmartAssist® Algorithms & Care Guide



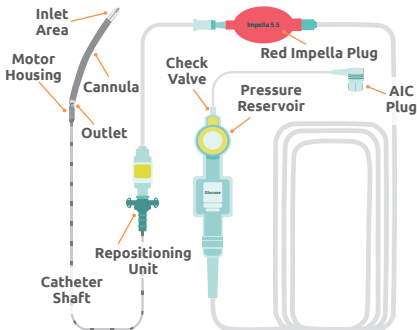
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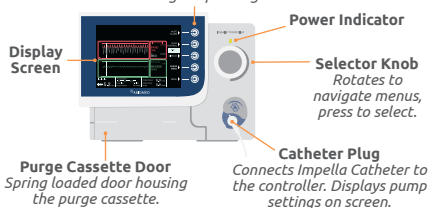
# Device Components

## Impella® Left 5.5 Pump



## Automated Impella Controller (AIC)

**Soft Buttons** Display and close menu options.  
Functions change depending on screen.



# Device Settings

## CP Flow Rates

P-Level	Mean Flow Rate (L/min)
<b>P-0</b>	0.0
<b>P-1</b>	0.0 – 0.9
<b>P-2</b>	1.1 – 2.1
<b>P-3</b>	1.6 – 2.3
<b>P-4</b>	2.0 – 2.5
<b>P-5</b>	2.3 – 2.7
<b>P-6</b>	2.5 – 2.9
<b>P-7</b>	2.9 – 3.3
<b>P-8</b>	3.1 – 3.4
<b>P-9</b>	3.3 – 3.7

## 5.5 Flow Rates

P-Level	Mean Flow Rate (L/min)
<b>P-0</b>	0.0
<b>P-1</b>	0.0
<b>P-2</b>	0 – 1.9
<b>P-3</b>	1.1 – 2.7
<b>P-4</b>	1.9 – 3.3
<b>P-5</b>	2.8 – 3.7
<b>P-6</b>	3.4 – 4.1
<b>P-7</b>	3.9 – 4.5
<b>P-8</b>	4.3 – 4.9
<b>P-9</b>	5.0 – 5.5

Select the lowest P-level recommended (P-2 or higher) that will enable you to achieve the flow rate necessary for patient support.

# Purge Management

**Purge Fluid:** Consists of D5W with 25 to 50IU/mL of heparin or D5W with 25 to 50 mEq/1L of sodium bicarbonate.

**Purge Flow (2–30mL/hr):** Regulated by the device, it represents the rate at which purge fluid is infused into the motor and delivered to the patient.

**Purge Pressure (300–1100mmHg):** Regulated by the device, the amount of pressure needed to push purge fluid through the pump motor.

## Changing the Purge Fluid & Cassette:

- Change per institutional guidelines.
- Follow step-by-step instructions in the Purge Menu.



DE-AIR PURGE



PURGE CASSETTE  
& FLUID BAG



PURGE FLUID  
BAG

## TROUBLE SHOOTING



**Air  
Detected**

AIC monitors for air in system. If detected, AIC signals an alert to disconnect luer and starts automatically de-airing the purge system.



**Purge  
Pressure**

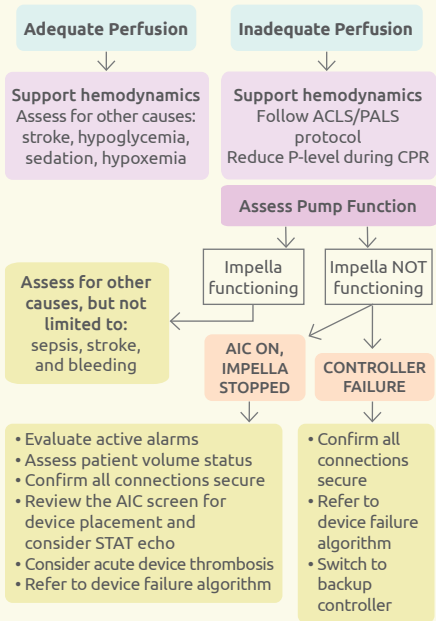
**(<300 mmHg)**  
Inspect purge system for leaks. If none, increase purge fluid dextrose concentration. If it continues, replace purge cassette.



**Purge  
Pressure**

**(>1100mmHg)**  
Inspect purge system and catheter for kinks. If none, decrease purge fluid dextrose concentration to 5%. If it continues, replace purge cassette. If the problem persists, contact AbioMed rep and consider TPA administration.

# Unresponsive Patient



# Suction

## "Suction" Alarm

Reduce P-level by 1 or 2

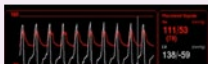


Assess Volume Status

Order Echo to confirm position and RV function



Suction can result in:  
Hemolysis OR Low Flow



### Diastolic Suction

- Normal systolic pressure
- Negative diastolic pressure (recovers by end of diastole)
- Low diastolic flow

*\*Usually volume-related*



### Continuous Suction

- Low systolic pressure
- Negative diastolic pressure
- Low systolic and diastolic flows
- Uncoupled Ao and LV waveforms

*\*Usually position-related*

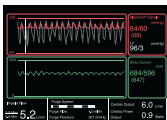
# Pump Placement & Assessment

Device Dimensions	Impella CP	Impella 5.5
Drive Catheter Diameter	9 Fr	9 Fr
Overall Largest Pump Diameter	14 Fr	21 Fr
Cannula Length	11.6 cm	9.6 cm
Cannula Length+Motor	13.5 cm	11.4 cm
Left Ventricle Length	8.5 cm	6.0 cm
Aorta Length	7 cm	6.4 cm

## Confirming Placement with Echocardiogram:

- Confirm position with transthoracic echo in the parasternal long axis window
- Correct position: catheter angled anteriorly toward the LV apex and away from the heart wall.
- Inlet position below the aortic valve:  
**CP = 3.5 cm    5.5 = 5 cm**

## AIC Placement Screen Waveforms

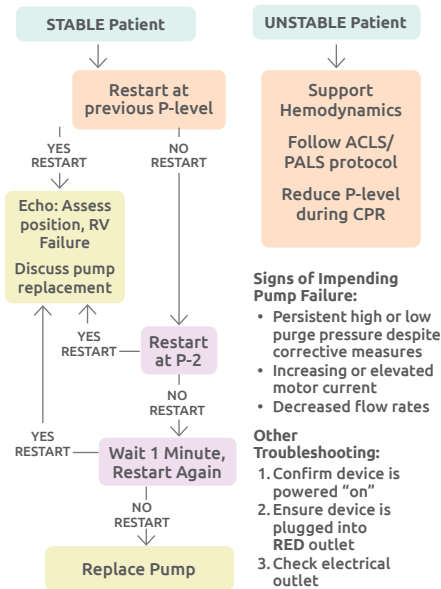


- **Aortic (red):** Fiber-optic sensor location relative to the aortic valve.
- **Ventricular (white):** Calculated waveform useful in managing the Impella.

- **Motor current (green):** Measures the energy intake of the motor relative to the aortic valve. Pulsatile currents, indicative of the cardiac cycle, confirm correct placement.

# Device Failure

## "Impella Stopped" Alarm





# Device Malposition

**STABLE Patient**

**UNSTABLE Patient**

**Assess  
Placement  
Signal**

**Support Hemodynamics  
Follow ACLS/PALS protocol  
Reduce P-level during CPR**

**Aortic Pressure**

*Motor Current Waveform:*  
**FLATTENED**



**Alarm: "Impella Position  
in Aorta"**

**Ventricular Pressure**

*Motor Current Waveform:*  
**DECREASED PULSATILITY**



**Alarm: "Impella Position  
in Ventricle"**

**Reduce to P-2  
Obtain ECHO to assess position  
Reposition per protocol\***

*\*If catheter is completely out of the ventricle,  
do not attempt to reposition without guidance.*

# Hemolysis

*Lab values and clinical exam consistent with Hemolysis.*

Cause	Controller Indicator/Alarms	Action
Inlet prox. to intra-ventricular structure	<b>"Suction"</b> , decreased flows	- Echo & Reposition - See "Suction"
Pump Malposition	Position alarms with decreased flows, <b>"Impella Flow Reduced"</b> <b>"Placement Signal Low"</b> <b>"Suction"</b> , decreased flows	- Reduce P-level - Echo & Reposition - See "Suction" &/or "Device Malposition" - Placement Signal Low
Higher than needed P-level	No controller indicators <b>"Impella Flow Reduced"</b> * <b>"Suction"</b> , decreased flows	- Reduce P-level - See "Suction"
Inadequate Preload	Position alarms <b>"Impella Flow Reduced"</b> <b>"Suction"</b> , decreased flows	- Reduce P-level - Assess vol. status - Echo - See "Suction" &/or "Device Malposition"

\* *"Impella Flow Reduced" alarm is specific to Impella CPSA (in AUTO mode only)*