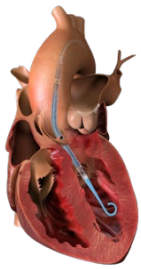
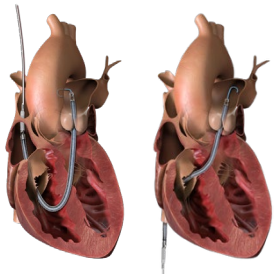
5P – IMPELLA PCG ADULT

PARAMEDIC





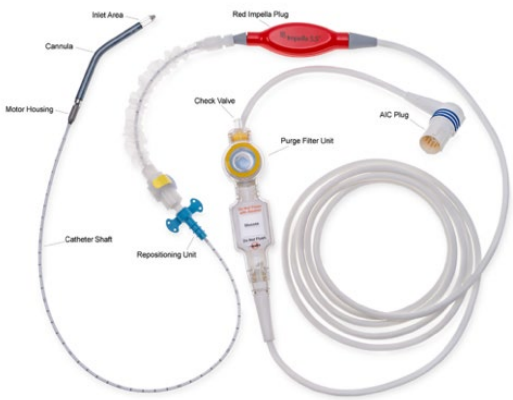
Left-Sided Impella	Right-Sided Impella
Inlet: Left Ventricle	Inlet: Right atrium
Outlet: Aorta	Outlet: Pulmonary Artery

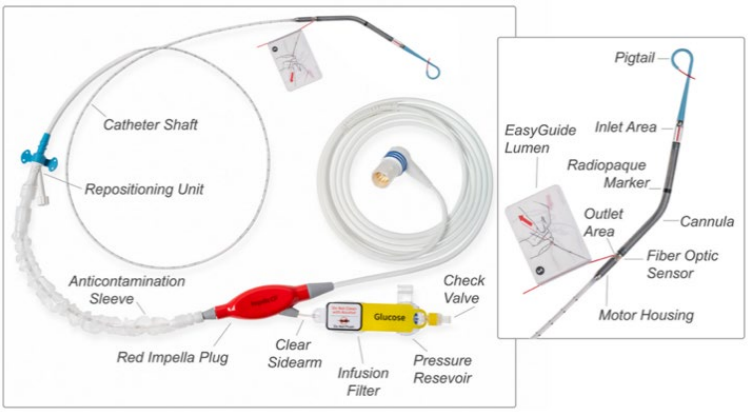
Introduction:

Impella devices are temporary, non-pulsatile, continuous flow pumps that propel blood from either the left ventricle to the aorta crossing the aortic valve, or from the right atria to the pulmonary artery, crossing both the tricuspid and pulmonic valves to support patients with cardiogenic shock. These patients will be encountered in interfacility transports to higher-level cardiac ICU care.

Indications:

Impella CP: Placed via the femoral artery with the inlet in the left ventricle and outlet in the aorta. Intended for short term use (≤ 4 days). Indicated for treatment of cardiogenic shock that occurs: 1) within 48 hours following acute myocardial infarction; 2) post open-heart surgery; 3) with cardiomyopathy, including peripartum cardiomyopathy; or 4) in myocarditis because of isolated left ventricular failure. It is indicated for patients weighing ≥52 kg. It is also indicated for providing temporary (≤ 6 hours) ventricular support during high-risk percutaneous coronary intervention (PCI) performed in hemodynamically stable patients with severe coronary artery disease.





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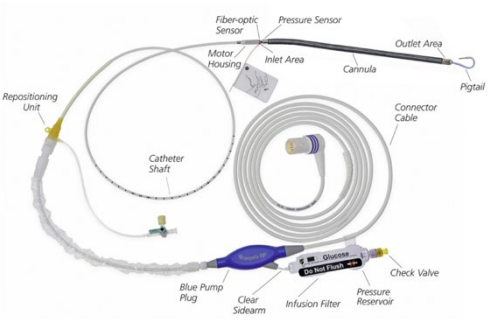
Impella 5.5: Placed via a graft to the axillary artery or direct to the aorta with the inlet in the left ventricle and outlet in the aorta. Intended for short term use (≤14 days). Indicated for treatment of cardiogenic shock that occurs: 1) within 48 hours following acute myocardial infarction; 2) post open-heart surgery; 3) with cardiomyopathy, including peripartum cardiomyopathy; or 4) in myocarditis because of isolated left ventricular failure. It is indicated for patients weighing ≥30.

Impella RP Flex: Placed via the femoral vein or internal jugular vein with the inlet in the superior vena cava vein, inferior vena cava vein, or right atrium and outlet in the pulmonary artery. Intended for short term use (≤14 days). Indicated for right ventricular support in the setting of: 1) acute right heart failure or decompensation following left ventricular assist device implantation, acute myocardial infarction, heart transplant surgery, or other types of open-heart surgery.



Before transporting the patient:

1. Review OMD/MCB Impella Video:

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2. Ensure no alarms are indicating complications.
3. Confirm placement of the device has been assessed via placement signal waveforms.
4. Confirm echocardiogram (cardiac ultrasound) imaging has been performed for Impella CP/Impella 5.5 or chest x-ray has been obtained for Impella RP Flex at sending facility.
5. Verify the device has adequate battery life for transport time to the ambulance.

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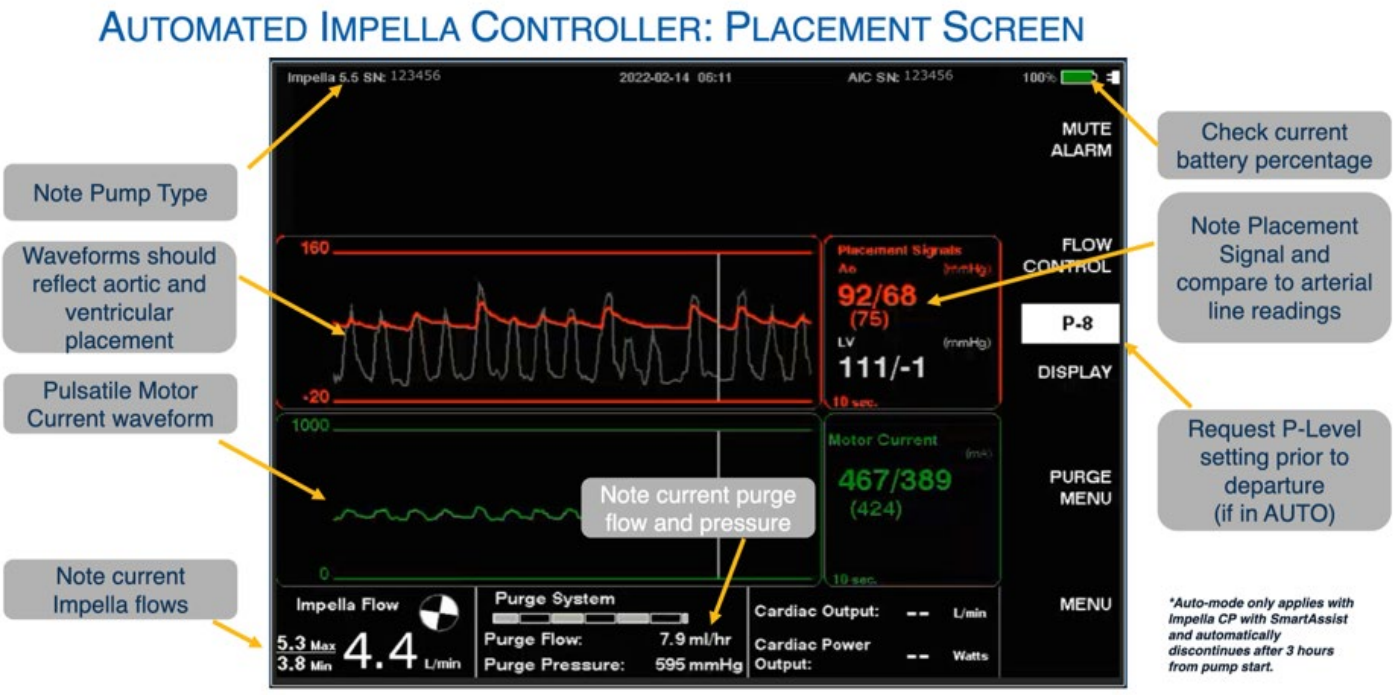
6. Assess insertion site prior to movement of the patient.
7. Ensure purge fluid is dextrose in water (D5W-D20W) with either 25-50 IU/mL Heparin or sodium Bicarbonate 25 mEq/1L. This fluid will be initiated by the sending facility.
8. Obtain back-up purge cassette from the sending facility.
9. Assess color of urine if foley catheter is in place and if patient is making urine.
10. Assess the extremity distal to the Impella insertion site for color, temperature, capillary refill, and pulses. Ask the sending facility staff to verify using a doppler device if necessary to assess pulsatile flow.
11. Perform 3-way conference call via EMSA Communications with Abiomed Clinical Support Center (available 24/7 at 1-800-422-8666) if local clinical consultant is not bedside. 3-way call will include Abiomed clinical support specialist, paramedic, and OMD consult.

<u>Utilize detailed pre-departure checklist and confirm checklist with sending facility.</u>



Placement for Impella CP and Impella 5.5

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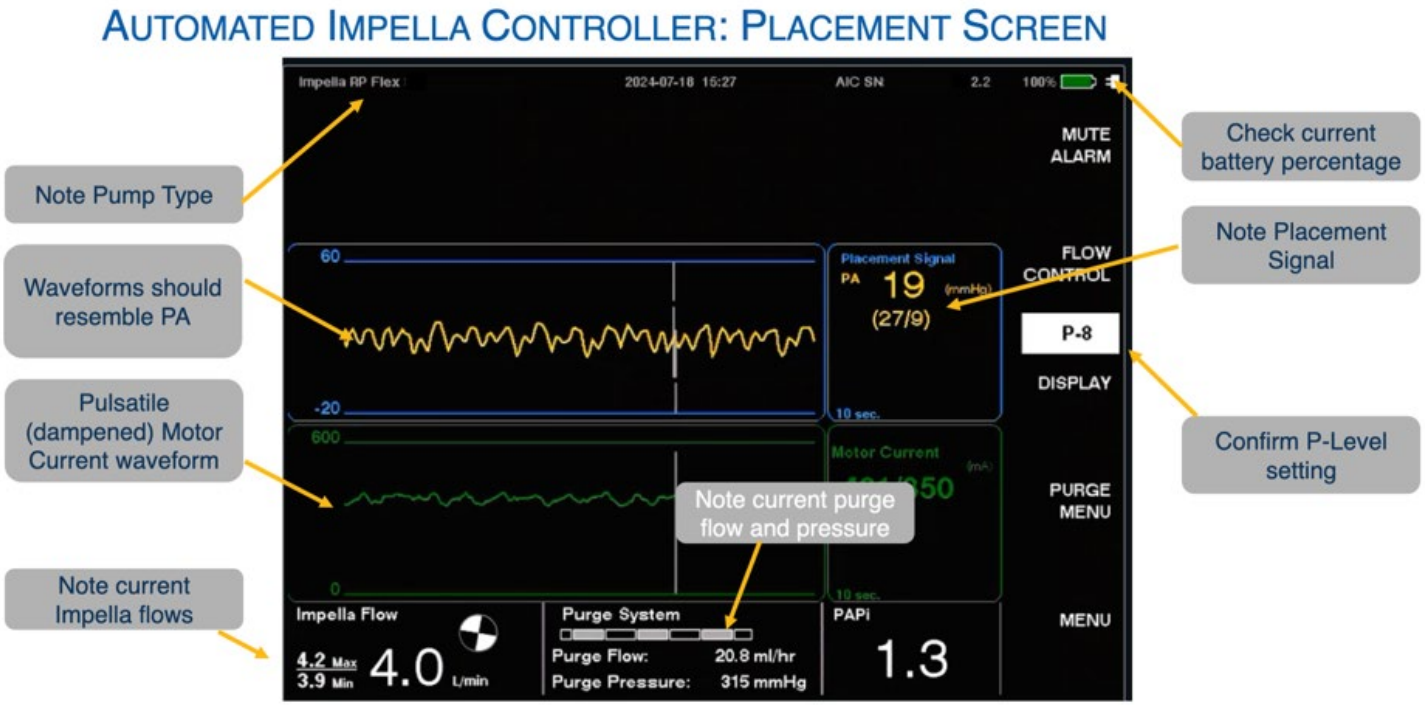

Placement for Impella RP Flex

<u>During transport of the patient:</u>

1. Whenever feasible, clinical personnel (ICU RN or perfusion tech) from the sending facility should accompany the patient during interfacility transport to help with any Impella issues that require immediate troubleshooting.
2. Plug Automated Impella Controller (AIC) in as soon as possible and verify it is charging. If running on battery power, there will be a white advisory alarm indicating "AC power disconnected."
3. Secure AIC in ambulance.
4. Assess device insertion site centimeter depth markings and locking mechanisms with each patient movement.
5. Maintain patient mean arterial pressure between 60 mmHg and 90 mmHg.
6. If mean arterial pressure is less than 60 mmHg, initiate norepinephrine infusion per Protocol 16II – Norepinephrine (Levophed). Contact OMD consult if further guidance is needed.
7. Never decrease left-sided Impella (Impella CP and Impella 5.5) devices lower than P-2 and right-sided Impella devices (Impella RP Flex) to a continuous flow less than 2 LPM

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Documentation/After transport of the patient:

1. Include Impella parameters that were noted at least every 5 minutes during transport. Impella parameters include: Impella flow, P-level, aortic placement signal, left ventricle placement signal, purge flow and purge pressure.
2. Automated Impella Controller equipment should not be swapped. The sending facility's Automated Impella Controller is to be returned to the sending facility, either with the facility's clinician accompanying the patient during transport or by arrangement between the receiving facility and the sending facility. It is not EMSA's responsibility to return the Automated Impella Controller to the sending facility.

Troubleshooting potential complications:

Suction Alarm:

A yellow suction alarm can be caused by:

1: Decreased preload
2: Improper Impella position
3: Right ventricular failure

If yellow suction alarm is encountered:

1: Touch the 'FLOW CONTROL' soft key. Use gray selector knob to decrease P-Level by 1-2 P-levels.
2: Assess Impella position by ensuring Aortic (red) and Ventricular (gray) waveforms and pulsatile green motor current.
3: Administer 250 mL NS bolus IV wide open flow.
4: Once fluid is administered, utilize 'FLOW CONTROL' soft key and gray selector knob to return to previous P-Level
5: If suction alarm is encountered again, initiate repeating steps 1-4 and make a 3-way conference call via EMSA Communications with Abiomed Clinical Support Center (available 24/7 at 1-800-422-8666). 3-way calls will include Abiomed clinical support specialist, paramedic, and OMD consult.

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Air in Purge Alarm:

A red air in purge alarm is caused by air detected in the purge tubing, purge fluid no longer running. Maintain purge fluid bag upright to avoid this alarm being encountered.

If red "air in purge" alarm is encountered:

1. Follow on screen directions by utilizing the 'PURGE MENU' soft key and gray selector knob to select 'de-air purge system.'

Pump Position in Aorta or Ventricle Alarms:

If a red "Impella in Aorta" or "Impella in Ventricle" alarm is encountered:

1. Utilize 'FLOW CONTROL' soft key and use gray selector knob to decrease P-level to P-2.
2. Impella is now not supporting the patient as intended and initiate norepinephrine infusion per Protocol 16II – Norepinephrine (Levophed) as needed to maintain mean arterial pressure greater than 60 mmHg. Contact OMD consult if further guidance is needed.
3. If patient condition and time permit, alert receiving facility to malpositioned Impella and change in patient condition.

Purge Pressure Low Alarm:

Normal purge pressure is 300-1100 mmHg with a purge flow of 2-30mL. If purge is functioning properly, you will not have any alarms, and the purge system will auto adjust flow to regulate its pressure.

1. Inspect purge system for leaks.
2. If purge pressure remains low, replace the purge cassette. Go to 'PURGE MENU' soft key, utilize gray selector knob to 'CHANGE CASSETTE & BAG,' and then follow on screen directions.

Purge Pressure High Alarm:

Normal purge pressure is 300-1100 mmHg with a purge flow of 2-30mL. If purge is functioning properly, you will not have any alarms, and the purge system will auto adjust flow to regulate its pressure.

1. Inspect purge system and Impella catheter for kinks.
2. If purge pressure remains high, replace the purge cassette. Go to 'PURGE MENU' soft key, utilize gray selector knob to 'CHANGE CASSETTE & BAG,' and then follow on screen directions.

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Damage to Purge Cassette or Purge Tubing:

Purge is needed for the Impella pump to adequately run and support the patient.

1. Go to 'PURGE MENU' soft key, utilize gray selector knob to 'CHANGE CASSETTE & BAG,' and then follow on screen directions.

Cardiac arrest/arrythmias:

Patient can be defibrillated or cardioverted with Impella support without any changes to the Automated Impella Controller or Pump.

If cardiac arrest occurs, utilize 'FLOW CONTROL' soft key to reduce the P-Level by 1-2 levels, but not lower than P-2, and treat the patient per all other applicable MCB Treatment Protocols for cardiac arrest, including continuous chest compressions until sustained ROSC is achieved.

If/When sustained ROSC is achieved, assess for any Impella alarms and pulsatile green motor current before utilizing the 'FLOW CONTROL' soft key and gray selector knob to slowly return to the P-Level prior to the cardiac arrest.

Pump Stop Alarm:

If a pump stop alarm is encountered:

1. Ensure Automated Impella Controller is plugged in to electrical power.
2. Try to restart the catheter at previous P-level.
3. If the Impella does not restart, try to restart at P-2.
4. If the Impella restarts, wean down to P-2 as the patient can tolerate. Under these circumstances, catheter function is not reliable and the Impella may stop again.
5. If the Impella does not restart, treat patient per all other applicable protocols and alert receiving facility of change in Impella support capability.

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Additional Resources:

Impella App

Impella Transport Video

24/7 Clinical Support Center

Impella CLINICAL SUPPORT CENTER 24/7

1-800-422-8666