

Misericordia University

## Misericordia Digital Commons

---

Student Research Poster Presentations 2026

Student Research Poster Presentations

---

2026

### Role of the Impella Device in Cardiac Catheterization

Madison Adams  
*Misericordia University*

Follow this and additional works at: [https://digitalcommons.misericordia.edu/research\\_posters2026](https://digitalcommons.misericordia.edu/research_posters2026)



Part of the [Medicine and Health Sciences Commons](#)

---

#### Recommended Citation

Adams, Madison, "Role of the Impella Device in Cardiac Catheterization" (2026). *Student Research Poster Presentations 2026*. 7.

[https://digitalcommons.misericordia.edu/research\\_posters2026/7](https://digitalcommons.misericordia.edu/research_posters2026/7)

This Poster is brought to you for free and open access by the Student Research Poster Presentations at Misericordia Digital Commons. It has been accepted for inclusion in Student Research Poster Presentations 2026 by an authorized administrator of Misericordia Digital Commons. For more information, please contact [mcech@misericordia.edu](mailto:mcech@misericordia.edu).

## Introduction

According to Moscucci et al. (2019):

- Problems with the heart can make it harder for the body to get the blood flow it needs, especially during serious or high-risk situations.
- In the cardiac catheterization lab, doctors use minimally invasive procedures to diagnose and treat these conditions.
- The Impella device is a type of mechanical support that helps the heart pump blood more effectively during these procedures or when the heart is not working well on its own. Understanding how this device works and when it is used is important for radiologic technologists who are part of the care team.

## Cardiac Cath Lab Overview

Rollins et al. (2022) state:

The cardiac catheterization lab, or cath lab, is a specialized imaging area where doctors diagnose and treat heart conditions using minimally invasive procedures. Catheters are inserted through blood vessels and guided to the heart using real-time imaging such as fluoroscopy.

Common procedures include coronary angiography to find blockages and percutaneous coronary intervention (PCI) to treat them. Devices such as the Impella are used to support patients during high-risk procedures. Radiologic technologists assist by operating imaging equipment, positioning patients, and maintaining a safe and sterile environment.

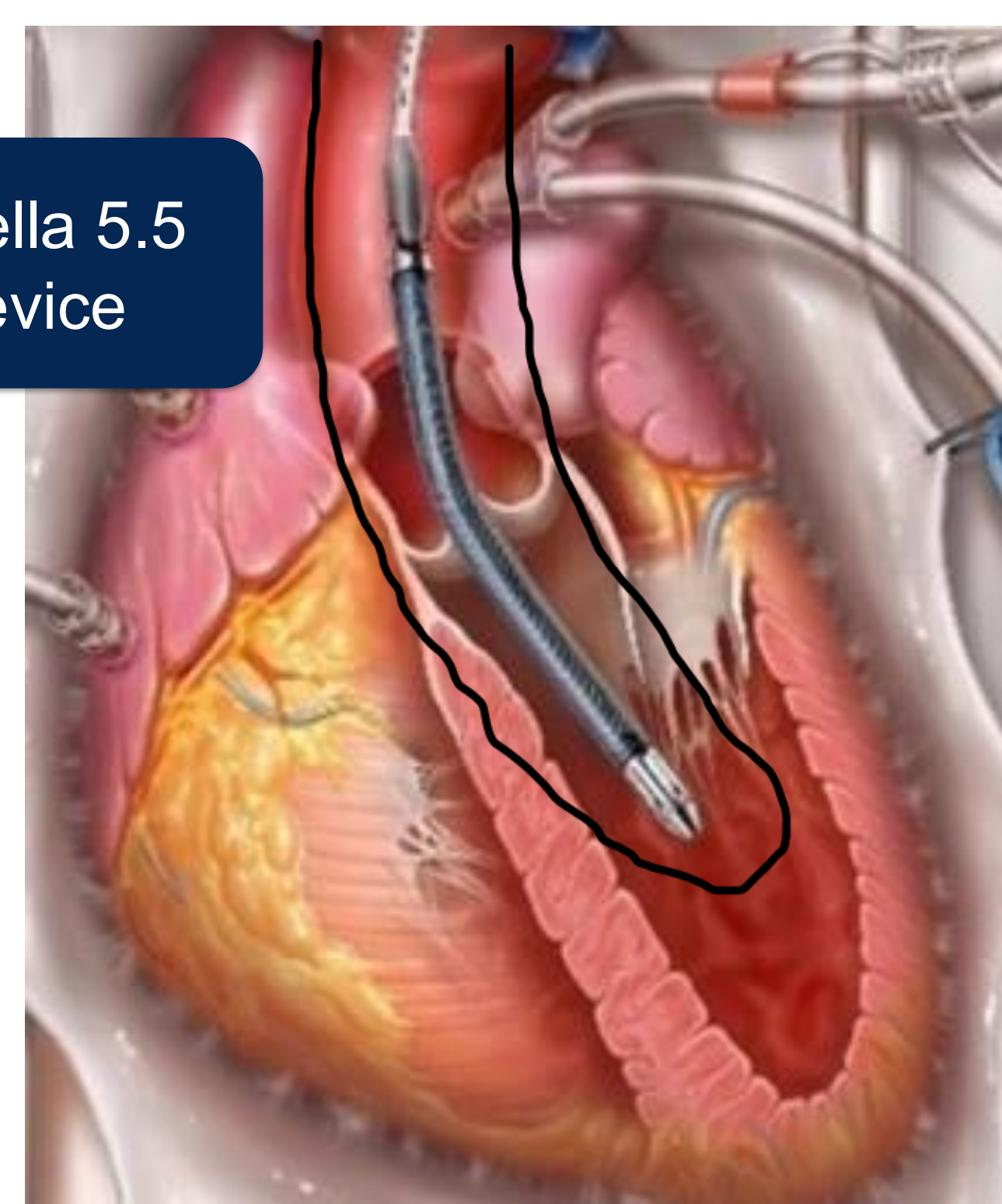


Figure 3. Aortic cross clamping with Impella placed in the aorta and left ventricle (Saito et al., 2024, para. 20)

## How the Impella Works

As indicated by Reddy et al. (2024):

- Inserted percutaneously, most commonly through the femoral artery
- Advanced through the aorta and positioned in the left ventricle
- Draws blood from the left ventricle and expels it into the ascending aorta
- Provides continuous forward blood flow to support circulation
- Reduces the workload of the left ventricle
- Increases cardiac output and improves overall perfusion to vital organs



Figure 8. A. Impella Controller screen showing vitals after correct placement of device (Gottula et al., 2022, para. 32)

## Role of the Radiologic Technologist

In accordance with Rollins et al. (2022):

- Perform equipment checks and ensure proper system functionality
- Assist with vascular access setup and imaging alignment
- Adjust imaging angles for optimal visualization of anatomy and device placement
- Communicate effectively with the cath lab team throughout the procedure
- Anticipate physician needs during device placement
- Monitor radiation exposure levels for patient and staff
- Ensure proper use of shielding and protective equipment
- Assist with contrast administration and monitor for reactions
- Recognize imaging artifacts & correct as needed
- Support patient monitoring equipment (leads, BP cuff, etc.)

## Indications for Use of Device

As reported by Saito et al. (2024):

- Cardiogenic shock
- High-risk percutaneous coronary intervention (PCI)
- Acute myocardial infarction with reduced cardiac output
- Severe left ventricular dysfunction
- Need for temporary mechanical circulatory support
- Bridge to recovery or further treatment (surgery or transplant evaluation)

## Contraindications

As indicated by Moscucci et al. (2019):

- Severe aortic valve disease (aortic stenosis or insufficiency)
- Mechanical aortic valve
- Left ventricular thrombus
- Severe peripheral vascular disease limiting access
- Aortic dissection
- Inability to tolerate anticoagulation

## Impella at Work

According to Nakagaito et al. (2025):

A case study was done using the Impella device on a patient presenting with unconsciousness and vomiting. After testing, the patient was found to have diabetic ketoacidosis, low ejection fraction, and cardiogenic shock. Due to the high risk of complications with any kind of invasive surgery on this patient, the Impella device was placed as the chosen treatment. Four hours after initial placement of the Impella, the patient presented in much better condition.

The Impella device was successfully able to “improve her hemodynamics by unloading left ventricle and supporting systemic circulation” (Nakagaito et al., 2025, para. 10).

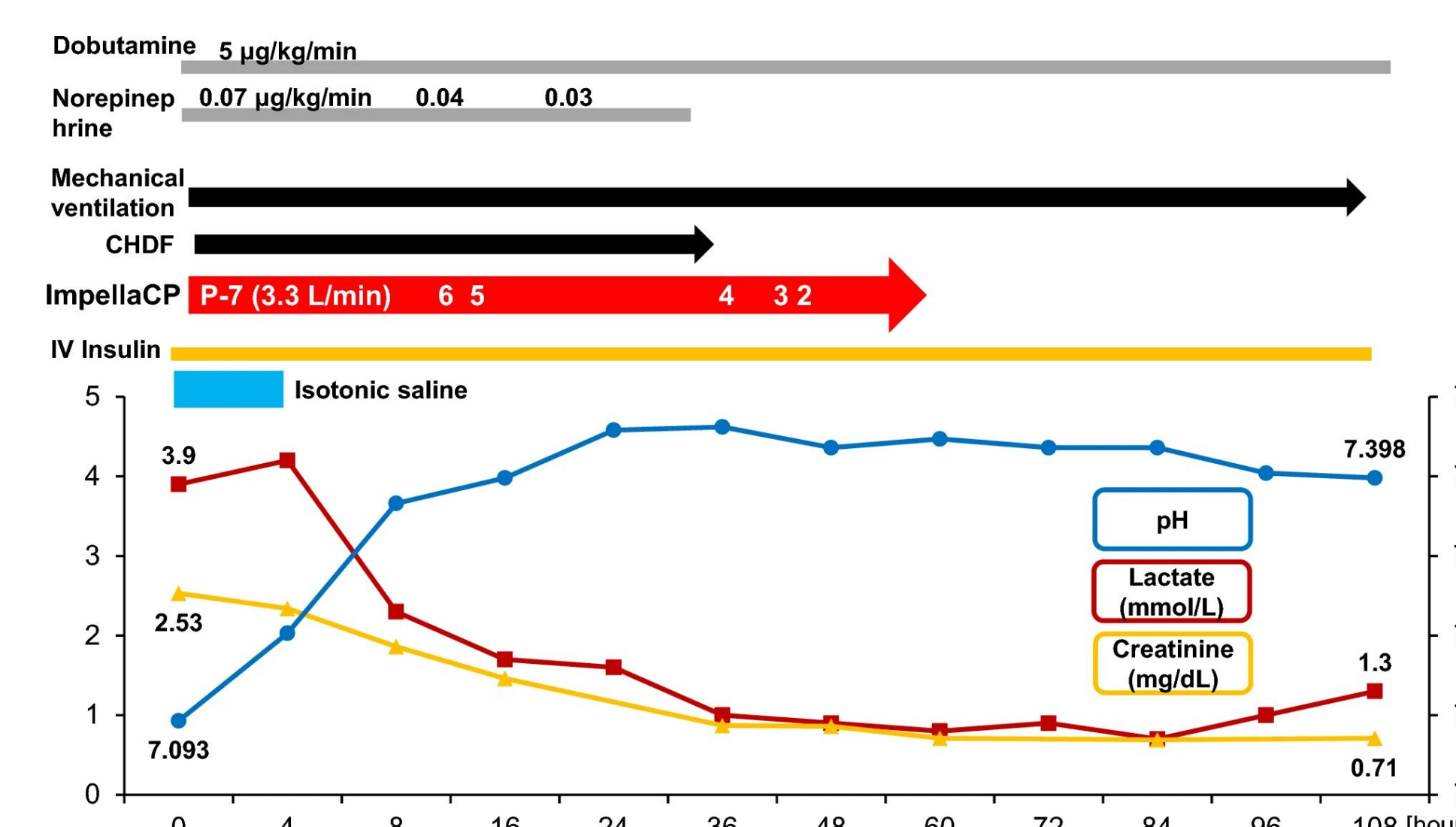


Figure 3. Hemodynamic changes after hours of Impella usage (Nakagaito et al., 2025, para. 10)

## Complications and Considerations

As stated by Moscucci et al. (2019):

- Risk of bleeding at the insertion site
- Possible vascular injury during insertion or placement
- Device malfunction or improper positioning
- Risk of hemolysis (breakdown of red blood cells)
- Infection risk with prolonged use
- Requires continuous monitoring of patient status and device function
- Careful management needed during transport or patient movement
- Anticoagulation therapy often required, increasing bleeding risk

## Monitoring and Management

Panuccio et al. (2022) state:

- Verify correct device position
- Monitor hemodynamics (MAP, cardiac output)
- Assess Impella console (flow, speed, alarms)
- Continuous ECG monitoring for arrhythmias
- Check access site for bleeding or complications
- Assess distal limb perfusion
- Monitor for signs of hemolysis
- Maintain anticoagulation as ordered
- Watch for device alarms or malfunction
- Ensure device remains securely in place

## Conclusion

- The Impella device is an important tool used in the cardiac catheterization lab to support patients with severe heart conditions, especially during high-risk procedures and cases of cardiogenic shock. It helps maintain blood flow while reducing the workload on the heart, which can improve patient stability during critical situations.
- While research shows that the device can be effective, it also comes with potential complications and requires close monitoring. Because of this, careful patient management and attention to detail are essential throughout the procedure and recovery period.
- Radiologic technologists play a key role by assisting with imaging, maintaining a safe environment, and supporting the healthcare team. Overall, the Impella remains a valuable form of mechanical circulatory support, with ongoing research continuing to improve its use and patient outcomes.