

## Emergence of Critical Care Medicine and its Impact on Cardiothoracic Surgical Care

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### Mini Review

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#### ABSTRACT

Cardiothoracic Surgical Critical Care Medicine (CTSCCM) is a medical specialty that deals with the care of critically ill patients who have undergone cardiothoracic surgery. The field is focused on the management of patients in the postoperative period, with the goal of optimizing outcomes and minimizing complications. CTSCCM is a complex and demanding field that requires specialized training and expertise in the care of critically ill patients. In this article, we will explore the key aspects of CTSCCM, including the types of procedures involved, the challenges faced by clinicians in this field, and the role of CTSCCM in improving patient outcomes. Cardiothoracic surgical procedures are those that involve the heart, lungs, and chest cavity. These surgeries are complex and require a highly skilled surgical team, as well as specialized postoperative care. Some of the most common cardiothoracic surgical procedures include Coronary Artery Bypass Graft (CABG) Surgery. This is a procedure used to treat coronary artery disease. During CABG surgery, the surgeon takes a healthy blood vessel from another part of the body and uses it to bypass a blocked or narrowed coronary artery. This helps to restore blood flow to the heart muscle and can relieve chest pain (angina) and improve overall heart function.

**Keywords:** Coronary artery by-pass graft surgery, Lung resection surgery, Aortic aneurysm

### INTRODUCTION

Heart Valve Repair or Replacement, heart valve surgery is performed to repair or replace damaged or diseased heart valves. This can improve the flow of blood through the heart and relieve symptoms such as shortness of breath and fatigue. Aortic Aneurysm Repair, an aortic aneurysm is a bulge in the wall of the aorta, the body's largest artery. If left untreated, an aortic aneurysm can rupture and cause life-threatening bleeding. Aortic aneurysm repair involves replacing the weakened section of the aorta with a synthetic graft to prevent rupture. Lung Resection Surgery, Lung resection surgery is used to remove a portion of the lung affected by cancer or other diseases. The remaining lung tissue is then able to function more effectively, improving overall lung function and quality of life. The care of critically ill patients who have undergone cardiothoracic surgery presents unique challenges to clinicians. These challenges include:

Hemodynamic Instability, after cardiothoracic surgery, patients are often hemodynamically unstable, meaning that their blood pressure, heart rate, and other vital signs may fluctuate rapidly. This instability can be caused by a variety of factors, including bleeding, fluid shifts, and changes in heart function. Clinicians must be able to quickly identify and address hemodynamic instability to prevent complications such as organ failure or death. Mechanical Ventilation, patients who have undergone cardiothoracic surgery often require mechanical ventilation, which involves the use of a machine to support breathing<sup>[1-3]</sup>. Mechanical ventilation can be challenging to manage, as patients may have varying degrees of lung function and may require different levels of support. Clinicians must be skilled in adjusting mechanical ventilation settings to optimize patient outcomes.

Pain Management, cardiothoracic surgery can be painful, and effective pain management is essential for patient comfort and recovery. However, many pain medications can have side effects such as respiratory depression, and clinicians must be skilled in balancing pain relief with the risk of complications. Coagulation Management, patients who have undergone cardiothoracic surgery are at increased risk of bleeding, and clinicians must be able to manage coagulation (clotting) effectively to prevent bleeding complications while minimizing the risk of thromboembolism (blood clots).

## LITERATURE REVIEW

### Role of cardiothoracic surgical critical care medicine in patients

Cardiothoracic Surgical Critical Care Medicine plays a crucial role in the care of patients who have undergone cardiothoracic surgery or who are critically ill with cardiothoracic conditions. Here are some of the ways in which Cardiothoracic Surgical Critical Care Medicine contributes to patient care:

**Postoperative management:** Cardiothoracic Surgical Critical Care Medicine specialists are responsible for the care of patients immediately after cardiothoracic surgery. They monitor patients closely for complications, such as bleeding, infection, and organ dysfunction, and take prompt action to address any issues that arise. They also manage pain control, nutrition, and other aspects of recovery <sup>[4,5]</sup>.

**Mechanical ventilation:** Many patients who have undergone cardiothoracic surgery require mechanical ventilation to support their breathing. Cardiothoracic Surgical Critical Care Medicine specialists are skilled in managing mechanical ventilation, including adjusting ventilator settings, monitoring oxygenation and carbon dioxide levels, and weaning patients off the ventilator as soon as it is safe to do so.

**Hemodynamic management:** Cardiothoracic Surgical Critical Care Medicine specialists are trained to manage hemodynamic instability, which is a common complication after cardiothoracic surgery. They monitor patients' blood pressure, heart rate, and other vital signs closely and use a variety of interventions to maintain stable blood flow to vital organs.

**Continuous renal replacement therapy (CRRT):** Cardiothoracic Surgical Critical Care Medicine specialists may use CRRT to support patients' kidney function in the ICU. CRRT is a form of dialysis that can be performed continuously over a period of several days, which may be necessary for critically ill patients who are unable to tolerate intermittent dialysis.

**Extracorporeal membrane oxygenation (ECMO):** In some cases, cardiothoracic Surgical Critical Care Medicine specialists may use ECMO to support patients' heart and lung function. ECMO involves using a machine to pump and oxygenate a patient's blood outside of the body, allowing the heart and lungs to rest and recover.

Overall, Cardiothoracic Surgical Critical Care Medicine is an essential component of the care of patients who have undergone cardiothoracic surgery or who are critically ill with cardiothoracic conditions. It requires a specialized skill set and a deep understanding of the unique challenges and complexities of these patients.

## DISCUSSION

### Emergence of critical care medicine and effect on cardiothoracic surgical care

The emergence of critical care medicine has had a profound impact on cardiothoracic surgical care. Critical care medicine is a specialty that focuses on the management of critically ill patients who require advanced monitoring, support, and treatment. In the past, patients undergoing cardiothoracic surgery were managed in a general surgical ward or in an intensive care unit (ICU) that was not specifically designed to meet the unique needs of cardiothoracic surgical patients. However, with the development of dedicated cardiothoracic ICUs and the increased use of specialized monitoring and treatment modalities, the outcomes of cardiothoracic surgery have improved significantly. One of the most important effects of critical care medicine on cardiothoracic surgical care is the ability to closely monitor patients and detect early signs of complications <sup>[6,7]</sup>.

For example, cardiothoracic ICUs are equipped with specialized monitors that can continuously monitor a patient's heart rate, blood pressure, and oxygen saturation. This allows healthcare providers to detect signs of hemodynamic instability or respiratory distress early on, which can help prevent serious complications. Another important effect of critical care medicine on cardiothoracic surgical care is the ability to provide advanced life support measures. For example, patients who undergo cardiothoracic surgery may require mechanical ventilation, inotropic support, or extracorporeal membrane oxygenation (ECMO) support. These advanced life support measures can be provided in a cardiothoracic ICU by specialized critical care teams who are trained to manage these complex interventions.

## CONCLUSION

Finally, critical care medicine has also had a significant impact on the postoperative recovery of cardiothoracic surgical patients. By closely monitoring patients in the ICU, healthcare providers can adjust medications and other treatments as needed to optimize the patient's recovery. Additionally, specialized critical care teams can provide multidisciplinary care that includes pain management, nutrition support, and physical therapy to help patients recover more quickly and with fewer complications. In summary, the emergence of critical care medicine has had a significant impact on cardiothoracic surgical care by allowing for closer monitoring, advanced life support measures, and specialized multidisciplinary care. These advances have contributed to improved outcomes and a higher quality of life for patients who undergo cardiothoracic surgery.

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## CONFLICT OF INTEREST

Authors declare no conflict of interest.

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