

# An Introductory Textbook of Cardiopulmonary Bypass

Cardiopulmonary bypass (CPB) is a vital technique used in cardiac surgery to temporarily take over the functions of the heart and lungs, allowing the surgeon to perform complex procedures on the heart while maintaining blood flow to the body. This article provides a comprehensive overview of CPB, covering its history, principles, components, and clinical applications.

## History of Cardiopulmonary Bypass

The concept of CPB was first proposed in the early 20th century, but it was not until the 1950s that practical techniques were developed. In 1953, John Gibbon successfully performed the first successful open heart surgery using CPB. Since then, CPB has become an essential tool in cardiac surgery, enabling surgeons to perform procedures that were previously impossible.



## AN INTRODUCTORY TEXTBOOK OF CARDIOPULMONARY BYPASS: A simple new approach to understanding cardiopulmonary bypass for the non- perfusionist

★★★★★ 5 out of 5

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## Principles of Cardiopulmonary Bypass

CPB works by diverting blood flow away from the heart and lungs and through an external circuit, where it is oxygenated and pumped back into the body. This allows the surgeon to stop the heart and open the chest without causing damage to the brain or other organs.

The CPB circuit consists of several components, including:

\* A heart-lung machine: This machine pumps the blood through the circuit and oxygenates it. \* A reservoir: This holds the blood that is being pumped through the circuit. \* A heat exchanger: This warms the blood to body temperature before it is pumped back into the body. \* A filter: This removes impurities from the blood.

## **Clinical Applications of Cardiopulmonary Bypass**

CPB is used in a variety of cardiac surgery procedures, including:

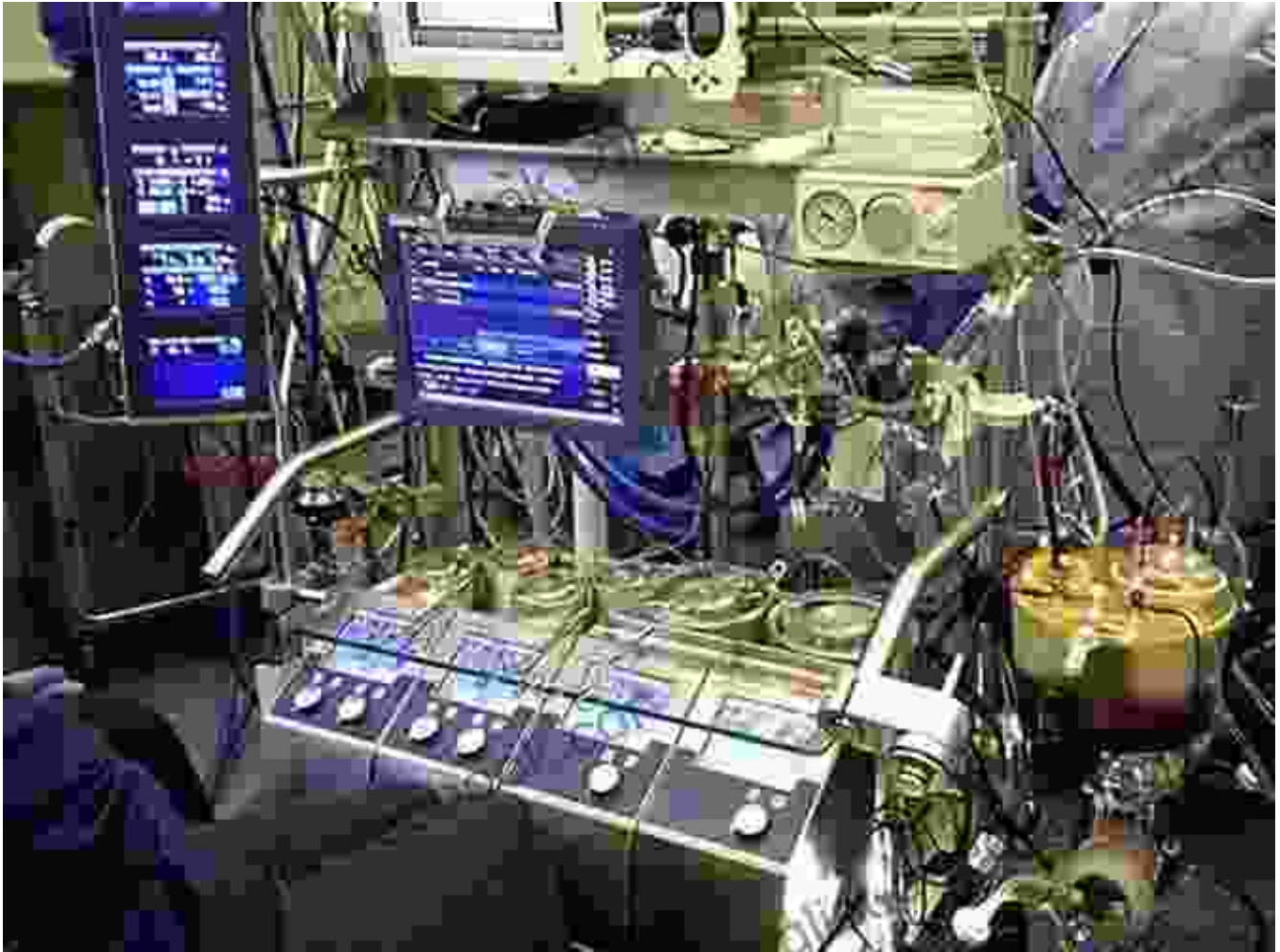
\* Coronary artery bypass grafting (CABG): CABG is the most common type of cardiac surgery, and it involves grafting a healthy blood vessel from another part of the body onto a blocked coronary artery. \* Valve replacement: Valve replacement is a procedure to replace a damaged or diseased heart valve with a new valve. \* Aortic aneurysm repair: An aortic aneurysm is a bulge in the aorta, the main artery that carries blood from the heart to the body. Aortic aneurysm repair involves repairing or replacing the damaged section of the aorta. \* Congenital heart defect repair: Congenital heart defects are birth defects that affect the structure of the heart and blood vessels. CPB is often used to repair these defects.

## **Complications of Cardiopulmonary Bypass**

CPB is a complex procedure, and it can carry some risks, including:

\* Bleeding \* Infection \* Stroke \* Kidney failure \* Lung injury \* Death

However, the risks of CPB are relatively low, and most patients recover fully from surgery.



Cardiopulmonary bypass is a vital technique that has revolutionized cardiac surgery. It allows surgeons to perform complex procedures on the heart while maintaining blood flow to the body, and it has saved the lives of millions of patients. While CPB carries some risks, it is generally a safe and effective procedure.



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