

# Cardiopulmonary Bypass (CPB) Treatment

**Ayantou Kebede**

*Department of Epidemiology, Jimma University, Ethiopia*

Cardiopulmonary bypass (CPB) may be a technique during which a machine temporarily takes over the function of the guts and lungs during surgery, maintaining the circulation of blood and therefore the oxygen content of the patient's body. The CPB pump itself is usually mentioned as a heart-lung machine or "the pump". Cardiopulmonary bypass pumps are operated by perfusionists. CPB may be a sort of extracorporeal circulation. Extracorporeal membrane oxygenation is usually used for longer-term treatment. CPB mechanically circulates and oxygenates blood for the body while by passing the guts and lungs. It uses a heart-lung machine to take care of perfusion to other body organs and tissues while the surgeon works during a bloodless surgical field. The surgeon places a cannula within the right atrium of the heart, vena cava or vena femoralis to withdraw blood from the body. Blood is far away from the body by the cannula then filtered, cooled or warmed, and oxygenated before it's returned to the body by a mechanical pump.

The cannula wont to return oxygenated blood is typically inserted within the aorta, but it's going to be inserted within the arteria femoralis, arteria axillaris, or brachiocephalic artery (among others). The patient is run heparin to stop clotting, and protamine sulfate is given after to reverse effects of heparin. During the procedure, hypothermia could also be maintained; blood heat is typically kept at 28°C to 32°C (82.4–89.6°F). The blood is cooled during CPB and returned to the body. The cooled blood slows the body's basal rate, decreasing its demand for oxygen. Cooled blood usually features a higher viscosity, but the crystalloid solution wont to prime the bypass tubing dilutes the blood. Cardiopulmonary bypass is usually utilized in operations involving the guts.

Operations requiring the opening of the chambers of the guts, for instance, bicuspid valve repair or replacement, requires the utilization of CPB to avoid engulfing air systemically and to supply a bloodless field to extend visibility for the surgeon. The machine pumps the blood and, using an oxygenator, allows red blood cells to select up oxygen, also as allowing CO<sub>2</sub> levels to decrease. This mimics the function of the guts and therefore the lungs, respectively.

CPB are often used for the induction of total body hypothermia, a state during which the body are often maintained for up to 45 minutes without perfusion (blood flow). If blood flow is stopped at normal blood heat, permanent brain damage normally occurs in three to four minutes death may follow shortly afterward. Similarly, CPB are often wont to rewarm individuals affected by hypothermia. This rewarming method of using CPB is successful if the core temperature of the patient is above 16°C.

Extracorporeal membrane oxygenation (ECMO) may be a simplified version of the guts lung machine that has a pump and an oxygenator to temporarily take over the function of heart and/or the lungs. ECMO is beneficial in post cardiac surgery patients with cardiac or pulmonary dysfunction, in patients with acute pulmonary failure, massive pulmonary embolisms, lung trauma from infections, and a variety of other problems that impair cardiac or pulmonary function. ECMO gives the guts and/or lungs time to repair or recover but it's only a short lived solution. Patients with terminal conditions, cancer, severe systema nervosum damage, uncontrolled sepsis and other conditions might not be candidates for ECMO.