

TEAM APPROACH IN OPEN HEART SURGERY

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In 1932, Dr. John Gibbon, then a surgical resident, envisioned a machine which could take over the function of the lung during an operation. Although his initial directive in developing this machine was not toward cardiac surgery, his work continued vigorously through the years and culminated in the performance of the first extracorporeal circulation in the correction of a congenital heart defect.

Since that time, extracorporeal circulation has been much more sophisticated in principle and, at the same time, has been simplified for practical use. Until suspended animation becomes a reality, extracorporeal circulation will be essential during surgery for the correction of intracardiac and many extracardiac lesions.

The Team

Heart teams evolved with the development of modern heart surgery. The heart team by necessity consists of surgeon and assistants—anesthesiologist, extracorporeal circulation technician, scrub nurse and circulating nurse. Because of the many ramifications and complications of extracorporeal circulation, the team must occasionally rely on help from others—that is, the cardiologist, nephrologist, ventilation therapist, neurologist and pulmonary physiologist. Never before in surgery have so many people been engaged in a single purpose.

Organization

The organization of such a team is essential to successful cardiac surgery. For the team to function properly, each man must respect and appreciate each other man. Each member must know both the importance and the limitation of his particular role and, for this reason, must rely on other members of the team for duties outside his sphere. Although designated the responsibility of certain aspects of the operation, team members should not be reluctant to solicit help from others.

More than one member of the team must be familiar with extracorporeal circulation. Besides the technician who is responsible for the maintenance, installation and performance of extracorporeal circulation, both surgeon and anesthesiologist should be competent to perform this procedure. If the surgeon and anesthesiologist fully comprehend the physiologic alterations produced by extracorporeal circulation, they can then perform their own functions more ably.

Operating room protocol has always called for the surgeon to head the operating team, but in open heart surgery above all other kinds, he must rely upon other members of a team for carrying out a successful operation. Without proper extracorporeal circulation, successful open heart surgery is not possible and results are often directly attributable to the efficacy of this modality.

A surgeon cannot direct his attention in too many directions at the time of open heart surgery. His efforts should be directed mainly toward the complete and proper repair of a cardiac defect. For this reason, the responsibility of extracorporeal circulation should be relegated to the anesthesiologist and pump technician.

The anesthesiologist is able to visualize the surgeon's maneuvers and, at the same time, note various physiologic parameters which are continuously monitored. Direct arterial pressure, electrocardiogram, electroencephalogram, central venous pressure, and blood gases claim his immediate attention. He, in turn, can correct abnormal alterations by medication or change extracorporeal perfusion by immediate conference with the pump technician.

Communication

Communication between the various members of the team is vital. Although the anesthesiologist may have a direct view of the surgical procedure, many surgical maneuvers which can alter body function or extracorporeal circulation are not always apparent. It is important that the surgeon notify both the anesthesiologist and pump technician of these maneuvers in order that proper hemodynamics are maintained throughout the operation. It is equally important that the anesthesiologist and pump technician inform the surgeon of changes in monitored parameters, as well as changes or difficulties in extracorporeal circulation. Many alterations detrimental to the patient can easily be corrected if all members are aware of the abnormality.

In discontinuing extracorporeal circulation, authoritative control is returned to the surgeon, since he is in better position to observe the heart's action in regaining its proper function.

There is nothing magic about open heart surgery or the use of extra-corporeal circulation. Today, open heart surgery is safe and cardiac maladies are being corrected with minimal risk. However, without team work such surgery is dangerous. It is imperative that strict protocol be followed, yet changes be accepted and adapted to the procedure, as necessary.

Although extracorporeal circulation today is safe, we should not be led into a false sense of security, for we are still in a developmental phase. We should be humbled by today's limitations and yet enthusiastic over tomorrow's achievements for through team effort the goals accomplished thus far may seem but minuscule in the future.