

Anaesthesia for Cardiac Surgery

What are the procedures in general anaesthesia?

- General anaesthesia is, simply stated, a state of drug-induced, reversible state of unconsciousness during which you will be entirely unaware of the pain and stress associated with the surgical procedure.

Anaesthesia for your operation shall be conducted / supervised by an anaesthesiologist, a doctor who is specialized in this aspect of medicine. General anaesthesia is provided by a variety of drug combinations aiming to keep you asleep, pain-free and your muscles relaxed. This helps to let you undergo the surgical procedure without being aware of it, while providing the surgeons ideal conditions for operating. The anaesthesiologist would insert some vascular cannulae into your veins and artery before or after you are unconscious, depending on your clinical situation. The venous cannula is used for injection of drugs while the arterial cannula is used for monitoring your blood pressure. As part of your general anaesthesia, you will also be put on artificial ventilation where an endotracheal tube is inserted into your windpipe then connected to a ventilator to keep your lungs ventilated.

- When you are anaesthetized, the anaesthesiologist will take care of your general condition and maintain your vital functions, including your heart rhythm, blood pressure, central venous pressure, heart function, oxygenation, various aspects of ventilation, body temperature, fluid intake and output, blood loss, etc. This allows us to provide necessary treatment based on your latest condition.
- For the majority of general surgical operations, the usual practice is to terminate and reverse the anaesthesia at the end of the surgical procedure. In the case of cardiac surgery, the standard practice is to keep the patient asleep and ventilated for the first few hours after surgery, and occasionally, even longer. This allows the patient to stabilize, bleeding to subside, body temperature to return towards normal and the severe pain associated with surgery to abate.

In this period, the patient will be very closely monitored, nursed and managed in the Intensive Care Unit.

- Once your condition is stable, the residual effects of the anaesthetic, sedative and analgesic medications are allowed to wean off. When you are fully awake, able to breathe adequately and demonstrate adequate muscle power, you will be taken off the ventilator. For the majority of cardiac surgical patients, this is only a matter of a few hours (1-6 hours). Occasionally, if you are still too sleepy, we may consider to take you off the ventilator the next morning rather than in the middle of the night. However, after the

doctor's evaluation of your overall general condition, the condition of the heart and lungs, and the type of your surgery, the period of ventilation may be extended to up to several days.

What are the possible risks and complications?

- Owing to the complexity of cardiac surgery, the anaesthesiologist may need to perform a number of invasive procedures to institute the requisite monitoring commensurate with your condition. Also, the state of anaesthesia will be achieved with the help of a number of different drugs. In general, modern anaesthesia is safe but these multiple procedures, drugs and the surgery themselves will still carry a certain risk. The common ones are relatively minor in nature and self-limiting, but a few, though very rare, could be of serious impact and a permanent nature.
- We have outlined some of the complications below:
 - (i) Postoperative nausea and vomiting: This is common for various types of operations and may be partly related to the drugs used for anaesthesia, mainly the ones to control your pain. However, it is usually self-limiting. If required, it can be effectively managed with other drugs and techniques
 - (ii) Post-operative pain: Any surgical incision is painful. As the surgical wound for cardiac surgery is quite big, it is a potent source of pain. We will effectively manage your pain with the appropriate dosage of medication, but this may cause some side effects including sleepiness and nausea as mentioned above. The worst is usually over after the first day of surgery.
 - (iii) Sore-throat like sensation: This may be caused by the insertion of tube in your windpipe and you will generally recover within a day or so after removal of the tube, unless the tube has been kept for an extended period.
 - (iv) Hoarseness of voice: Approximately 3-5% of patients develop hoarseness of voice after cardiac surgery. The percentage may be higher for certain type of surgery, such as those involving the aortic arch. This is due to a number of causes, including insertion of endotracheal tube, use of ice around the heart during surgery, the surgical procedure itself and perhaps transoesophageal echocardiography. If hoarseness persists, we will arrange Ear, Nose and Throat specialists for consultation. In the majority of cases, the patient's voice will recover to normal, in due course, either spontaneously or with treatment.
 - (v) Allergic reactions: Despite the doctor's utmost care in obtaining your history of allergic reactions, you may develop allergic reaction to one or more of the many drugs administered during anaesthesia and the perioperative period. The allergic reactions can mostly be managed very effectively with standard medicines. However, occasionally a reaction can be very serious and fulminant, which may manifest as a

life threatening anaphylactic reaction and this may be totally unpredictable.

- (vi) Injury to the lips, tongue, mouth cavity and teeth: These are not uncommon and usually caused by the procedures relating to the insertion of endotracheal tube (laryngoscopy and intubation). Injury to the teeth may be more likely if the teeth are loose or protruding, and / or if the conditions for the laryngoscopy are less than favourable. Your anaesthesiologist will discuss with you in details should he anticipate such difficulty.
- (vii) Difficulty in / failure to establish a secure airway: Occasionally it may be difficult to visualize your airway entrance (larynx) via laryngoscopy and insert the endotracheal tube. Rarely, it may be even impossible to achieve tube insertion by conventional techniques. This may be caused by a variety of unfavourable conditions. Your anaesthesiologist will assess your airway, mouth opening, neck movements, etc. If he anticipates significant difficulty, he will inform you and discuss alternative techniques with you. Occasionally, extreme difficulty in securing an airway may become obvious only after you have been anaesthetized. The anaesthesiologist will take the best course of action accordingly.
- (viii) Awareness: During your operation and anaesthesia, we take every care to ensure that you are fully asleep and totally unaware of the procedure during this period. However, there is still a possibility that you may be fully or partially awake during the operation, although it is very rare.
- (ix) Risk of blood transfusion: It is quite common for patients undergoing cardiac / aortic surgery to receive transfusion of blood and / or blood products in the perioperative period. The chances of such transfusions are higher if the surgery is more complex and likely to cause excessive bleeding. You are advised to read the leaflet on the issue of blood transfusion. Transfusion is associated with some risks despite every care being taken to render the blood safe and free of infective agents. We would carefully assess the benefits and risks before transfusion.
- (x) Risk associated with invasive monitoring: The various aspects of your body functions that we need to monitor entail several invasive procedures. Please refer to the leaflet on monitoring procedures for details and possible complications.
- (xi) Very, very rarely anaesthesia may lead to fatality. This happens either because the patient's pre-existing overall condition is so poor to withstand the fluctuations in circulatory status due to induction of general anaesthesia, or development of some catastrophic complications.
- (xii) Post-operative complications such as chest infection, stroke / neurological complications, myocardial infarction / ischaemia: These complications may occur in the post-operative period and are more likely to be related to the seriousness of the preoperative condition and complexity of surgery rather than the anaesthetic procedure itself. The surgeon would discuss these issues with you.

Remarks

This is general information only and the list of complications is not exhaustive. Other unforeseen complications may occasionally occur. In special patient groups, the actual risk may be different. For further information, please contact your anaesthetist.

Complications may sometimes occur despite all precautions. However, if they do occur, your anaesthetist will take appropriate steps to manage them.