

Anesthesia Information for Patients

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Written April 2006. Updated April 2012.

Do I have to go to sleep for my surgery?

Not necessarily - not all surgery requires that patients undergo general anesthesia. Many procedures can be done under local anesthesia, such as many cosmetic surgical procedures, although frequently some intravenously (IV) administered sedation is given, such as a Valium-like drug or some narcotics that may make you sleepy and may reduce pain.

Major surgery almost always requires that you go to sleep (general anesthesia).



Examples are open heart surgery or repair of a big aneurysm (bulging) in the aorta. However, many procedures can also be done under "regional anesthesia" by putting tubes (catheters) into the epidural space in your back and injecting anesthetics in this space. Regional anesthesia can be used for surgical procedures such as knee operations or even hip replacements, as well as many other extremity procedures. An alternative to the epidural technique is often a "spinal" technique which is similar to an epidural, but will be discussed elsewhere. In many cases, the anesthesiologist will know exactly what anesthetic

technique he or she prefers given your clinical circumstances, and may not offer you much in the way of flexibility. On the other hand, there are often times when a variety of anesthetic techniques will be suitable and input from the patient is relevant. As well, the anesthetic technique preferred will depend on the clinical experiences of the anesthesiologist and the institution in which he or she works.

Why do I have to avoid eating and drinking after midnight the night before surgery?

The reason for this is that the anesthesiologist wants to ensure that your stomach is empty before you go to sleep. This is to avoid the possibility of any food or other materials in the stomach ending up in your airway. This can result in a serious reaction known as "aspiration pneumonitis" and can even be life-threatening (kind of like spilling battery acid into your lungs). Part of the reason for this concern is that when you go to sleep the airway protection reflexes, such as your gag reflex, is diminished or eliminated by the anesthetic drugs, so that special effort must be carried out to ensure that there is no possibility of anything in your stomach ending up in your lungs where you would either suffocate or get a serious inflammatory reaction causing the lungs to end up severely damaged. In emergency cases where you may have undergone major trauma just after having a big meal at McDonald's, there is little that can be done to ensure there is no food in the stomach prior to surgery. Although one possibility would be to suck the food out with a big tube, this turns out to be impractical, and it is very uncomfortable to the patient. There are, however, specialized techniques that can be helpful in this particular circumstance, one of them being a maneuver by which the trachea is pushed down against the esophagus to close off the esophagus just before you go off to sleep and have the breathing tube (endotracheal tube) inserted. This reduces the likelihood that food would pass up from the stomach through the esophagus into the mouth.

What is an anesthesiologist? An anesthetist? A nurse anesthetist?

Anesthesiologist

An anesthesiologist is a man or woman with a medical school background who has done additional training at the post-graduate level in anesthesiology and in resuscitation. This usually involves a four-year training period after the completion of an internship program (or its modern equivalent). Following the residency training, there is a national examination to determine the person's competence. Frequently, anesthesiologists undergo more training post-certification ("fellowship" training) to get really good at a subspecialty such as neuroanesthesia or pediatric anesthesia.

Nurse Anesthetist

A nurse anesthetist is a nurse with additional training at the post-graduate level in anesthesia leading to a master's degree. This usually involves 2-3 years of training following 1-2 years experience in critical care nursing. Following this training there is a certification examination to establish competence. Nurse anesthetists provide a broad range of anesthesia services in collaboration with a physician or dentist. Nurse anesthetists exist in a number of countries such as the United States or in Sweden, but do not exist in other countries such as in the United Kingdom or in Canada. In those countries, MDs with training in anesthesiology are sometimes known as anesthetists. Their training is identical to that of anesthesiologists. The difference is merely in what they call themselves.

What drugs are used to put people to sleep for anesthesia during surgery?

Many people think that the anesthesiologist gives you the needle, you go off to sleep, and then some time later you wake up and that is all there is to it. Nothing could be further from the truth, as administering a good anesthetic involves the wide use of many drugs in what some people call "polypharmacy at its very best". The following will give you an outline how the procedure of giving an anesthetic is actually done.

Once you are brought into the Operating Room, an intravenous is started and a number of monitors are hooked up. In very major cases, special monitors, such as monitoring lines going into the heart or into the artery for blood pressure measurement, may be used. As well, if a lot of blood is expected to be lost, more than one intravenous line may be started. After the anesthesiologist has checked his anesthesia machine and surveyed the environment in which he or she is working to ensure everything is in place, the patient is given oxygen by face mask and a number of drugs are given to start the induction of the anesthetic. Typically, this will involve a drug ("hypnotic") such as propofol to help you to go to sleep (induce general anesthesia), and then followed by a "muscle relaxant" such as rocuronium to relax all the patient's muscles. With muscle relaxation, the patient is very definitely paralyzed and completely unable to move. This, of course, would be a horrible experience if you are awake, but it is done after the propofol is given so that you are unaware of this. The reason the muscle relaxant is given is that it makes it very easy then to put in a breathing tube (endotracheal tube), which is usually introduced with the assistance of an instrument called a laryngoscope. Later on, muscle relaxation may be needed to facilitate the surgeon's work.

With the introduction of the breathing tube or endotracheal tube, the patient is then usually hooked up to a ventilator (breathing machine) which breathes for him or her during the surgery. Very often, additional medications to keep you asleep are introduced through the anesthetic breathing tube. These include nitrous oxide ("laughing gas"), typically in a concentration in the range of 60% to 70%, accompanied by oxygen for the balance, and with a "potent inhalational anesthetic agent" such as sevoflurane or isoflurane. For example; 1% isoflurane will commonly be used to keep people asleep. This is called the "maintenance" phase of the anesthetic. Not infrequently, these potent inhalational agents will be used in conjunction with narcotic analgesics to keep the pain to a minimum. A common drug used in this application would be fentanyl or even good old-fashioned morphine. The anesthesiologist continually monitors your depth of anesthesia during the procedure and adds more drugs as he or she sees fit to keep the appropriate level of anesthesia and the appropriate level of surgical muscle relaxation.

Will I be intubated? What if they can't get the breathing tube in?

For many surgical procedures a breathing tube, known as the endotracheal tube, is introduced using an instrument called the laryngoscope. This tube goes through the vocal cords into the windpipe and is sealed into position using a special cuff inflated with air. Ordinarily, there is little difficulty in inserting the tube once anesthesia has begun. However, from time to time, the anesthesiologist may experience difficulty in inserting

that tube. This is called "difficult intubation". If your anesthesiologist encounters this problem, which occurs about one in every hundred or so cases, he or she has a protocol or algorithm to deal with this problem. In some cases, this may involve using an alternative form of airway management or may involve waking the patient up and doing the procedure under regional anesthesia (e.g. epidural or spinal). The particular approach taken in this rather unusual circumstance will depend on the training or preferences of your anesthesiologist. Incidentally, if your anesthesiologist tells you after the surgery that he did have trouble putting in a tube even though he got it in, it will be wise to get all the details from him or her in a form of letter or other document so that you will have this information at hand for other anesthesiologists who you may encounter in the future. In fact, the Medic-Alert Foundation has a difficult airway record system available to keep this kind of information sorted out.

Will I have a sore throat after the surgery?

Not infrequently, the insertion of the endotracheal tube or breathing tube can result in the patient having a sore throat after the surgery. This is by no means a major problem, but naturally some people find it annoying. Note, however, that a sore throat can occur even if intubation is not carried out, for example, with use of an alternative airway management technique such as the so-called "laryngeal mask airway". Occasionally, people use ice chips or throat lozenges to deal with this problem, but most of the time, when it does occur, it is too minor to be particularly troublesome.

What if I wake up during the surgery?

Awareness under anesthesia is rare, but it certainly can happen. Fortunately, your anesthesiologist has a variety of clinical signs they can use to assess how deeply under the anesthetic you are. These include measurement of heart rate and blood pressure, response to surgical stimulation, and observing facial expression such as grimacing, and other things. Brain wave monitoring is also commonly used. In ordinary elective surgery, awareness under anesthesia is very rare, but can occur. Where the problem is a little more troublesome is in Caesarean section surgery under general anesthesia where the anesthesiologist wants to keep the anesthesia levels at a minimum to avoid obtunding the baby before he or she is delivered. As well, during major trauma where there is massive amounts of bleeding, the patient's blood pressure may be in a precarious position, and the anesthesiologist may not be able to give as much anesthetic as he or she would like for fear of reducing the blood pressure to very dangerous levels. Again, this is uncommon, but it certainly can occur.

Will I experience nausea and vomiting after the surgery?

There are two issues involved in discussing nausea and vomiting after surgery. First of all, certain surgical procedures are more likely to induce nausea and vomiting than others. For example, some operations around the eye, particularly "strabismus" surgery, can result in nausea and vomiting, particularly in children. As well, some surgery dealing with the bowel can result in nausea and vomiting after the surgery. Other procedures

like hand surgery or neurosurgery are less likely associated with nausea and vomiting post-operatively. In any event, should nausea and vomiting occur, there are a variety of maneuvers and medications that can be helpful to prevent this from occurring. One thing is to avoid moving the patient around if possible.

Where nausea and vomiting still occurs, a variety of medications are available that can make things far more pleasant for the patient. For example, the use of Zofran 4 mg or Decadron 6 mg intravenously can be helpful in reducing nausea and vomiting after surgery. As well, propofol (our most popular intravenous anesthetic agent) has been associated with a reduction in frequency of nausea and vomiting, and is therefore very popular for patients who have experienced previous nausea and vomiting. If you have big time problems with nausea and vomiting after previous surgery, please make a point of letting your anesthesiologist know, so that he or she can decide what anesthetic technique to use to minimize this possibility.

What about keeping me free of pain after the surgery?

There are enormous variations in the amount of pain a patient will experience after surgery. Some surgical procedures like those involving spreading of the ribs in thoracic procedures can be very painful. Other procedures like cataract surgery can be relatively painless. Another kind of surgery that tends to be painful is orthopedic surgery - for example, repairing broken bones by internal fixation (plates and screws). Pain management in the recovery room area is usually taken care of by small doses of intravenous (IV) morphine or Demerol, for example, 2 mg to 4 mg of morphine at a time, until the patient is comfortable. On the surgical ward, it is quite common to give intramuscular (IM) morphine or Demerol, for example morphine 10 mg IM every 2-4 hours, or a similar amount of Demerol, for example 100 mg IM. Use of intramuscular medication is time-honored and very effective, but suffers the drawback that by the time that you experience the pain and get the nurse to get the drugs and draw them up, do the paperwork, and administer them, the pain may have become considerably worse. As a result of this problem, a lot of effort is done into the development of improved methods of pain relief, of which a popular method, known as "patient controlled analgesia" (PCA), works very well. In the case of PCA, the patient is able to control the amount of pain medication by themselves merely by pushing a button whenever they experience pain. When the button is pushed, if the computer inside decides that it is safe to do so, you get a small dose of narcotic analgesic, for example, morphine 1.5 mg. Following the administration of this dose, you are "locked out" from getting any more medication for a particular period, for example 5-10 minutes. After that, you can get more medication simply by pushing the button if the computer decides that it is safe, that is if you are now out of the lockout period.

Another method of pain relief that is very effective for many big surgical procedures such as thoracic surgery, is the use of epidural analgesia, whereby a needle is placed in your back and through the needle a tube is placed so that medication can be put in

every few hours. This is a very effective method of pain relief, although not every patient is pleased to have a needle put in their back.

Once you are eating and drinking well, the need for intravenous or intramuscular medications is reduced, and oral medications can be helpful. Not infrequently we have used Tylenol with Codeine, for example Tylenol #2 or Tylenol #3, to provide pain relief. Occasionally, the Tylenols, or similar medications, are not adequate for some kinds of pain, in which case "breakthrough" medication may be ordered, for example the use of 10 mg of IM Morphine once or twice a day as needed, if the oral medication is not doing the job completely.

Do I really need an IV? When can the IV come out at the end of surgery?

In almost all cases of surgery, and certainly in all cases of major surgery, one or more intravenous lines may be started depending on your anesthesiologist's assessment of how important they are. Frequently, the intravenous is started with a little bit of local anesthesia in the back of the hand, although other sites can be used as well. The IV is truly a lifeline and is used not only to provide analgesics (pain killers) such as morphine, and anesthetic agents such as propofol, but also as a route for fluids to ensure that your body is in appropriate fluid balance and is producing adequate amounts of urine. The IV also serves as a "lifeline" where emergency drugs can be given to treat complications such as high blood pressure or low blood pressure, or high heart rate or low heart rate, or countless other things for which drugs are available. As to when the IV comes out at the end of surgery, the usual guidelines are that the patient has to be able to eat well and drink well and does not have a need for intravenous medications such as antibiotics.

What if I am allergic to the anesthetic?

Allergic reactions can occur with any administered drug and by any route. Allergies to anesthetic agents such as propofol or succinylcholine or any other countless drugs, can occur, but fortunately, are relatively rare. From time to time, people get hives or urticaria, to use the clinical term, and this may be associated with reddening of the area, so-called erythema, but "true blue" anaphylactic shock-type reactions are, fortunately, rather rare. In this very rare circumstance, should an anaphylactic reaction occur, the patient will usually have a low blood pressure, high heart rate, and other clinical findings such as difficulty in getting the air into the patient. Your anesthesiologist is trained to recognize these kinds of problems and knows how to deal with them. The mainstay of treatment for an anaphylactic reaction is the use of epinephrine (Adrenalin) in a dose of 2-4 micrograms per kg body weight, administered every few minutes until the problem settles. Although anaphylactic reactions under anesthesia are exceedingly rare, of course, they can happen, and your anesthesiologist will give you all the details if this event occurs. I have experienced 2 such events in my clinical career, and both patients did very well, but it certainly was a frightening experience for all parties concerned (but not for the patients - they were asleep all the time).

I have a loose tooth. Is that a problem?

Your anesthesiologist will want to know about any loose teeth or capped teeth or dentures or bridges or crowns. This is because when the laryngoscope is introduced to allow the insertion of the endotracheal tube or breathing tube, the teeth are very close by and there is always a possibility of a tooth being chipped or damaged, particularly if a tooth is capped or if a tooth is loose. By giving any details of any loose or capped teeth, or that kind of thing to your anesthesiologist, he or she can make a particular effort to avoid exacerbating the problem. Sometimes, if a tooth is really loose, it is wise just to take it out before starting the anesthetic to avoid the possibility that the tooth may be dislodged and end up being aspirated into your lungs.

I have a bad heart. Should I worry?

Anesthesiologists very frequently deal with patients with bad hearts, bad lungs, bad kidneys, and all sorts of other clinical conditions. They know how to deal with these problems because they have had years of training after having finished medical school, so that they will know the best way to deal with these and other problems. Your anesthesiologist will ask you a number of questions about your heart and how bad the disease is to allow him or her to formulate a plan to minimize the risk associated with your condition. He or she may even arrange for further tests or consultations to learn more about your condition.

I am a smoker. Is this a special problem for the anesthesiologist?

No question about it, smokers are more of a problem than non-smokers from an anesthetic point of view. Smokers are more likely to undergo airway-related complications such as "bronchospasm" or "laryngospasm" after the induction of the anesthetic or after the breathing tube is pulled out, but fortunately, these are not as common as they could be and usually we deal with these problems without excessive difficulty. Nevertheless, most anesthesiologists would not like to have to deal with these problems at all. If you are a smoker, my advice is to quit smoking as soon as you can. This is sometimes impractical advice in that the period before surgery is potentially very stressful for the patient. But even if you can quit smoking for only 48 hours before the surgery, this alone will help reduce the degree of carboxyhemoglobin in your blood and allow more oxygen to be transported in your body. Smokers must also be especially careful to carry out deep breathing exercises after their surgery to prevent collapse of their lungs and/or pneumonia. The use of a so-called incentive spirometer can be very helpful in this context.

I don't want any morphine or Demerol or anything like that after the surgery. I am worried about getting addicted to narcotics. Am I being paranoid?

The simple answer is, yes. There is no need to be concerned about the appropriate use of post-operative narcotic analgesics in ordinary people. The situation is more complicated for patients that have been previously narcotic addicts, but that is a special

case. For the ordinary person, the use of narcotic analgesics like morphine is perfectly appropriate and perfectly safe, provided appropriate clinical precautions are used. One thing for sure, if you don't have adequate pain relief after surgery and this interferes from such things as early mobilization or deep breathing exercises, you increase the risk of complications such as blood clots in the lung or pneumonia.

A relative of mine got into some sort of trouble with her anesthetic. Could it happen to me too?

There are 2 hereditary problems which can have implications for your anesthesiologist. One is a syndrome known as "malignant hyperthermia" which is triggered by anesthetic agents such as isoflurane or succinylcholine. If this was the case, your relative might have experienced episodes of severe fever and other problems during the surgery or in the recovery room. By providing your anesthesiologist with the details of what happened to your relatives, he or she will be able to decide whether or not special precautions in your case are necessary.

Another problem can be that some people are unable to metabolize (breakdown) the drug succinylcholine which, as I have mentioned, is often used to relax the muscles during the surgery. As a result of their inability to metabolize this drug, the drug may last much longer than it would ordinarily. This is called atypical or absent cholinesterase. People who have experienced profound weakness after the anesthetic is completed, may have this problem, which occurs in about 1 in 3,000 people. Again, the details of the story you provide to your anesthesiologist will allow him or her to decide what appropriate precautions would be necessary.

Will I receive blood during my surgery?

Only if absolutely necessary. Anesthesiologists are far more reluctant to give blood products than they were, say, 20 years ago, and with good reason. Still, all blood given is tested for HIV, Hepatitis B and C viruses and other pathogens. Then again, testing isn't always perfect, which explains in part a reluctance to give blood unless it is more-or-less absolutely necessary.

If your religious creed forbids receiving blood transfusions (Jehovah's Witness), this places the anesthesiologist in a sticky situation. Some will refuse to care for the patient in elective cases where there is a strong possibility that blood will be needed. Others (myself included), will honor the patient's wishes and not give blood even if the patient is at extreme risk of dying from anemia (and one of my Witness patients did exactly that).

How does my anesthetist know that everything is OK during my surgery?

Your anesthetist keeps an eye on numerous things during your surgery, including blood pressure, heart rate, oxygen levels, urine output and other parameters using advanced (and some not so advanced), medical instruments such as pulse oximeters, electrocardiograph monitors, capnometers and other gadgets. As well, there is still a

role for looking at the patient (for color, sweating, etc.), and other means of "hands-on" assessments (the "art" part of medicine). I sometimes tell my patients they are more closely monitored than astronauts. Some are reassured; some mention the Space Shuttle catastrophes.

Will my anesthetist be with me at all times during the surgery?

Someone competent to monitor your condition and adjust your anesthetic must be present at all times during your surgery. This may be a doctor trained in anesthesia or a doctor in anesthesia training operating under supervision. In many countries, and especially in the USA, this may also be a nurse anesthetist operating under the supervision of an MD (in which case, of course, the MD must be readily available should big-time trouble be encountered that the nurse anesthetist cannot handle). In any event, we don't just give the patient "a shot" and leave the room.