Anaesthesia in Dogs and Cats

Pet owners are often anxious about veterinary procedures that involve anaesthesia. This handout attempts to alleviate some of these concerns.

The word *anaesthesia* comes from the Greek meaning "lack of sensation". Anaesthesia is accomplished by administering drugs that depress nerve function. With general anaesthesia, the patient is made unconscious for a short period. During this unconscious state, there is muscular relaxation and a complete loss of pain sensation.

Other types of anaesthesia include local anaesthesia such as numbing a localized area of skin or a tooth, and spinal anaesthesia, such as an epidural block, that results in anaesthesia of a particular part of the body.

**What are the risks of general anaesthesia?**

There is always risk of an adverse reaction when we use any anaesthetic agent, no matter whether it is for a short-term sedation, a short general anaesthesia or for a general anaesthesia lasting several hours. But here is some information addressing some of the questions you may have.

**What are the risks and is my pet at risk?**

It is estimated that approximately 1 in 100,000 animals will have some sort of reaction to an anaesthetic agent. These reactions may range from mild swelling at the site of injection or a mild decrease in cardiac output, to a full-blown episode of anaphylactic shock or even death. Experts, however, put the risk of anaesthetic death as less than the risk of driving to and from the hospital to have the anaesthetic procedure.

Another potential danger associated with anaesthesia arises if the dog is not properly fasted prior to anaesthesia. Anesthetized patients lose the normal reflex ability to swallow. During swallowing, the epiglottis, a cartilage flap that closes over the entrance to the windpipe, prevents food or water from entering the lungs. If there is food in the stomach, the dog could vomit while under anaesthesia or in the early recovery period. If vomiting occurs before the swallowing reflex occurs, the vomited material can be aspirated or enter into the lungs, causing aspiration pneumonia, a potentially life-threatening condition.

Other rare complications of anaesthesia include organ system failure such as kidney liver or heart failure, visual impairment, clotting disorders and seizures. We take every precaution to minimize these risks during your pet’s anaesthesia. Only when the benefits outweigh the risks, will we perform anaesthesia on your pet.
Are there things that can be done to minimize the risks?

Pre-surgical physical examination, pre-operative blood and urine tests and radiographic examination may detect clinical and sub-clinical problems. Certain medical conditions will increase the risk of having an anaesthetic complication. These conditions include heart, liver or kidney disease, diabetes mellitus, anaemia, dehydration, and certain infectious diseases such as heartworm disease.

How will a blood test help?

Blood tests will increase the chance of detecting a hidden problem that could prove to be life threatening. In older animals, chest radiographs are sometimes recommended to ensure there is no pre-existing pathology in the heart or lungs that might increase the risk of an adverse reaction.

What else will you do to minimise the risk to my pet?

Immediate intravenous access for emergency drug administration is one of the most important factors in the successful treatment of cardiovascular or respiratory failure in either the awake or the anesthetized patient. By placing an intravenous (IV) catheter and line before anaesthesia, we ensure that this lifeline is already in place, should the need arise. Anaesthetics, fluids and emergency drugs can be administered through the IV line.

Intravenous fluids help maintain blood pressure in the anesthetized patient and will replace lost fluids (during surgery, fluids are lost through evaporation from body cavity surfaces, through bleeding, and in any tissues that are being removed). Intravenous fluid therapy speeds the recovery process by diluting the anaesthetic agents circulating in the blood stream and by enhancing their elimination through the liver and kidneys. Patients that receive IV fluid therapy generally wake up faster than those that do not. Additionally, studies have shown that 0.9 - 2% of all patients that receive general anaesthesia will develop kidney dysfunction or failure 7-14 days after anaesthesia. This risk is significantly reduced in patients that receive intravenous fluid therapy during and, in an older patient well before, their surgery.

Although 98% of all pets will have no problem at all during anaesthesia anyway, our goal is to eliminate that unknown 2%. Therefore, we recommend that all surgery patients should receive intravenous catheterization and fluid therapy.

From the moment your pet goes under anaesthesia until the moment they are fully awake and even beyond that, your pet will be monitored closely with advanced equipment and have a dedicated anaesthetic nurse looking after them during the anaesthesia and their recovery. The latter is particularly important as quite a few anaesthetic problems occur in the first 10 minutes after the anaesthetic.

What can I do to help?

You should ensure that your pet’s complete medical history is available to us your veterinarian, especially if your pet has been seen at another veterinary clinic. Before anesthetizing your dog, we need to know about any medications or supplements that your dog has received in the past few weeks, any pre-existing medical conditions, any known drug reactions, the results of previous
diagnostic tests, and whether your pet has undergone any anaesthetic or surgical procedures in the past. Other useful information includes the pet's vaccine status and reproductive status, (i.e. when was its last heat cycle).

**Why do I have to sign an anaesthetic consent form?**

We will ask you fill in an anaesthetic consent form when you drop your pet off with us. This is because we feel that it is important that you fully understand what will happen to your pet, and that you acknowledge that you understand the risks. The form includes consent to perform surgery or other specified diagnostic testing and should provide an estimate of the expected costs of the procedures. The form also helps us gather some of the important things we need to know, in order to keep you pet safe. Finally, the form has a question on it regarding whether you wish us to perform cardio-pulmonary resuscitation (CPR) in the event of an anaesthetic emergency.

**Can you describe a typical anaesthesia?**

All anaesthesia patients are weighed on admission and are given a thorough pre-anaesthetic examination. This includes an examination of the chest, a feel of the abdomen, and assessment of the gums (checking for hydration status and evidence of good circulatory status. The medical history will be reviewed, and additional diagnostics such as blood or urine testing, blood pressure, electrocardiogram (ECG) or x-rays of the chest or abdomen may be performed prior to administration of any anaesthetic drugs.

In the great majority of cases, a technique called 'balanced anaesthesia' is used. With balanced anaesthesia, the patient receives a combination of sedatives and anaesthetic agents that is based on its body weight and best suited to its individual needs. The most common combination is a pre-anaesthetic sedative and opioid analgesia combination that is administered by injection, followed by an induction agent that is also administered by injection and then maintenance of the anaesthetised state with an anaesthetic gas mixed with oxygen. In order to ensure accurate delivery of the gas anaesthetic, a breathing tube, called an endotracheal tube, is inserted into the windpipe or trachea. In addition to delivering the gas to the lungs, the endotracheal tube seals off the airway so that the patient does not accidentally aspirate fluids or other foreign material while s/he is unconscious and unable to swallow.

**How do you monitor an anesthetized dog or cat?**

Anaesthetic monitoring in a veterinary hospital is similar to that found in any human hospital. Below is a list of common methods of monitoring anaesthesia:

**The Anaesthetic Nurse** is the most important form of monitoring during an anaesthetic procedure. This professional staff member is trained to observe and monitor your pet throughout the entire procedure, from induction until recovery. The nurse adjusts the anaesthetic levels according to the patient's vital signs and ensures that the patient remains stable throughout the procedure. The nurse remains with your pet whilst s/he wakes up.

**The Electrocardiogram**, abbreviated as ECG, is also known as an EKG (from the German term). An ECG shows the rate and pattern of the heartbeat. It will detect and show abnormal heartbeats called
arrhythmias. If an arrhythmia is detected, we will make appropriate changes in anaesthesia and/or administer emergency medications.

The Heart Rate Monitor measures the number of heart beats per minute. Heart rate must be maintained within a certain range. The depth of anaesthesia and surgical stimulation can both affect heart rate. By monitoring heart rate, increases or decreases can be detected early and anaesthetic adjustments made quickly, resulting in smoother anaesthesia for our patients.

The Blood Pressure Monitor measures the systolic (when the heart contracts or pumps) and the diastolic (when the heart relaxes or refills) blood pressure. Coupled with other monitoring equipment, this gives detailed information on the cardiovascular status of your pet.

The Respirometer measures the number breaths per minute.

The Core Body Temperature is monitored, especially during a prolonged surgery. Low or high body temperature can cause dangerous complications. Maintenance of normal body temperature is especially important in small or very old patients.

Pulse Oximetry may be used to monitor the amount of oxygen in your pet’s blood (SpO2) and the pulse rate. This instrument is used in conjunction with other pieces of monitoring equipment.

How long will it take my dog to recover from anaesthesia?

With today’s anaesthetics, many of which are reversible, your pet should be almost completely normal by the time of discharge. Many pets are a bit sleepy or tired for twelve to twenty-four hours after anaesthesia. If your pet appears to be unusually sluggish or you cannot arouse him/her easily, contact us or an emergency facility immediately to receive specific advice.