Sidney ANIMAL HOSPITAL
9842 Second Street; Sidney, BC Canada V8L 3C6
T: 250-656-3333 W: www.sidneyanimalhospital.com
E: sidneyanimalhospital@shaw.ca

WHY SHOULD I REQUEST A POST MORTEM FOR MY PET REPTILE?

The loss of a pet is never easy and almost always presents questions to owners and veterinarians alike, as to why exactly the animal died or reached the point at which euthanasia was necessary. In the case of reptiles and other “exotic” pets, the prevalence of underlying, undiagnosed or poorly understood disease is high. Many of these species have not been in the pet trade for long, so their normal physiology, dietary and environmental needs may not be fully known. Our understanding of some species has grown to the extent that they no longer commonly die simply because we don’t feed them properly, instead they are living long enough to develop the illnesses to which all animals become m‹re susceptible with age. An example is the Green Iguana. Fifteen or twenty years ago, when they were commonly fed cat food, these plant eating lizards suffered from disease conditions related to high fill and protein levels, and a lack of calcium and plant fiber. They died young of Metabolic Bone Disease (see related articles) and kidney failure. Now it is not unusual for iguanas to reach ten to five years of age, and the pattern of illness is shifting toward more longstanding, degenerative disease, which shows a greater promise for treatment than the acute or sudden organ failure of iguanas in the past.

Necropsy is the term used to refer to an autopsy or post mortem examination performed on a non-human animal. Ideally, a necropsy should be performed on all pet reptiles, which die or are euthanized. A great deal can be learned from the procedure and this knowledge will be beneficial, directly or indirectly, to owner, veterinarian and to other reptiles. The nature of medicine is such that in a few cases we cannot reach a final diagnosis, except with a necropsy. A gross post-ma1em (what can be seen with the naked eye) is usually the first step, and this may be sufficient. In some cases, microscopic, toxicological or other sophisticated laboratory techniques may be required.

REASONS TO ALLOW A NECROPSY

The reasons to consider allowing a necropsy to be pet finned oo a captive reptile vary with the situation. The owner of a single iguana has different concerns than does a hobbyist who breeds boa constrictors and occasionally looks after his friend's pythons. The keeper who cares for several species from many natural habitats and who may have very valuable animals moving through his premises stands to lose financially if be does not understand the general health of the collection. Your reptile veterinarian should be able to explain to you what a necropsy may teach you in your particular situation, as well as be able to outline the limitations.

Every necropsy win further the owner's and the veterinarian's understanding of the species. Reptile medicine is sufficiently new, and encompasses so many species that even the most experienced practitioner will periodically find something which be has never before seen. This may be a novel disease process, or a normal feature that he has never seen. The veterinarian may simply make a mental note of the finding, and it may help to distinguish normal from abnormal in a future case. He would frequently discuss findings with olher exotic pet practitioners, and he may even publish the finding. It is important to realize that in most cases, significant discoveries will reach well beyond your veterinarian.

Sidney ANIMAL HOSPITAL
9842 Second Street; Sidney, BC Canada V8L 3C6
T: 250-656-3333 W: www.sidneyanimalhospital.com
E: sidneyanimalhospital@shaw.ca

Having experienced the loss of a pet, many owners find sane confirm or relief in the knowledge that nothing more could have been done. If there are other pets at bane, there may be a concern regarding infectious disease. If the disease was a reflection of husbandry practices, a necropsy may provide solid evidence of the need to make changes and may give clues as to the health of any other pet reptiles.

Captive reptiles often suffer from two or mere disease conditions. One disease process may overshadow another. It may be difficult or impossible to diagnose each condition in the live animal. This may be a reflection of the animal's size, temperament, degree ‹w nature of illness, lack of available testing ‹w financial constraints.

Reptiles can be affected by a number of zoonoses (diseases transmissible from non-human animals to man). Particularly if there are immune comprised individuals in the home, it may be extremely impu1ant to be certain that the reptile was ‹w was not affected by a given disease.

If a reptile is one of a large collection experiencing disease, it may be prudent to sacrifice an individual showing signs representative of the condition, in order to reach a diagnosis. This is especially the case when infectious disease is suspected. Some diseases, such as those affecting the central nervous system, can be difficult to diagnose definitively in a live animal. When there are no simple blood ‹w tissue tests and a large collection is at stake, the sacrifice of one animal may be the most expedient means of reaching a diagnosis, oo which the well-being of many animals may rest.

Some diseases, particularly viruses, are notoriously difficult to eradicate from a collection, due to the presence of carrier animals. These are animals that may harbor the disease, infect other animals, and yet show no signs of illness themselves. Some diseases may lie dormant within the animal for months or years. When faced with the possibility of unknown disease within a collection, selective necrqI8y is sometimes the best choice.

The nature of the disease must also be considered. Some viruses, bacteria and parasites are difficult to transmit between animals and are easily eliminated from the environment with sound hygiene practices and treatment of the animals. Other agents of disease are extremely tough, requiring very aggressive disinfection procedures, replacement of equipment, and in sane cases, depopulation and replacement of the collection. When the lives of the animals are at stake, not to mention financial and labor investments, the development of a logical plan requires a definitive diagnosis.

When a collection of reptiles is involved, post mortem or necropsy data may appear particularly useful in hindsight. When mortality patterns and necropsy findings are analyzed, they may reveal trends in deaths or illness. Over weeks, months or years it may be possible to make associations with changes in such factors as diet, lighting, season, or a variety of other housing and husbandry parameters, which may show effects over relatively long periods.

Sidney ANIMAL HOSPITAL
9842 Second Street; Sidney, BC Canada V8L 3C6
T: 250-656-3333 W: www.sidneyanimalhospital.com
E: sidneyanimalhospital@shaw.ca

In the event that a necropsy is not performed, it may be advisable to store the body of the reptile (frozen). This is a form of "insurance", in case of further deaths. The identity of the animal should be recorded, as should the date and manner of death, as well as any information about behavioral or physical changes and veterinary care. It is easy to forget and mix up individuals; good records are an invaluable resource when it canes to understanding the dynamics of a disease process or husbandry (see related articles for details of record keeping).

Necropsy Procedure

Should you decide to have a necropsy performed on your pet, your reptile veterinarian will start by taking a thorough history of the animal, the husbandry conditions and the signs, or symptoms it showed before death. Obviously, if the animal experienced a protracted illness, or was under veterinary care when it died, your vet will already be familiar with the events preceding the loss of your pet. The cause of death may already be suspected. The results of tests performed when the animal was alive may have yielded a diagnosis or clues as to where to look during the necropsy.

If the animal is one of several in a collection, your veterinarian will want to know the health status of other animals and whether ‹w not there were any recent introductions to the group, changes in husbandry or medical therapy. Again, records can prove extremely useful. Important details may come to light in a retrospective consideration of records, which ensure that the most information possible is gained from the necropsy, and increases the likelihood that the fact‹n which lead to the death of the reptile will be determined.

Depending on the case, your reptile veterinarian may perform the necropsy hbnsel1: ‹w he may send the body to a veterinary pathologist. His decision will be based oo the particular features of the case. For example, if a zoonosis (a disease transmissible from animals to man) is suspected, precautions may have to be taken during the procedure and in disposal of the body, which require facilities found only in laboratories or some veterinary practices.

Whether for financial reasons, or because the cause of death bas been determined early in the process, not every necropsy will involve every step listed below. The veterinarian or veterinary pathologist pet performing the procedure has been trained to follow a logical sequence of steps, developed to maximize the knowledge gained from the procedure. He will proceed systematically, examining the body's tissues and organs and taking the required samples.

Sidney ANIMAL HOSPITAL
9842 Second Street; Sidney, BC Canada V8L 3C6
T: 250-656-3333 W: www.sidneyanimalhospital.com
E: sidneyanimalhospital@shaw.ca

The first step in the necropsy procedure is an external examination of the reptile's body. This will include an assessment of the animal's body condition, skin, mouth cavity, limbs and digits (if present) and an examination for external parasites. Any wounds, or abnormalities will be noted and measurements, such as length or weight may be taken. Relevant samples might include a biopsy of skin and any parasites to be identified. A culture of a wound or discharge might also be performed, to identify bacteria or fungus, where relevant. In some cases a radiograph (X-ray) can provide useful information, even after death. Radiographs can reveal fractures or bone disease (see the article on Metabolic Bone Disease). Some foreign bodies, particularly those made of metal, can be seen on a radiograph. These may or may not be the immediate cause of death, but will be easier to locate, particularly in the case of larger animals, if the anatomic location can be pinpointed. Examples include coins and fish hooks.

Next the veterinarian will follow a sequence of steps as be opens the body cavity to examine internal organ. Most veterinarians, as a matter of training and habit, proceed in the same fashion each time a necropsy is performed. This makes it less likely that a step will be missed. First, the relative position of the organs is noted. This gives a clue as to whether an enlargement in one structure is pushing other ~ Old of their normal positions. The amount of tilt in the body cavity and the muscle mass are assessed. This may shed light oo the animal's nutritional state or the duration of disease. The organs are removed from the body cavity b further examination. The digestive tract is examined along its length, and foreign bodies or other blockages might be found at this time. The contents of the digestive tract may be submitted for further analysis. This might include testing b toxins (note that there is DO one test which “checks for poison” — specific tests must be chosen, based on the toxin suspected). Samples taken from the contents of the digestive tract, or from the walls of the digestive tract may reveal parasites. Cultures of bacteria are also commonly taken during the necropsy, not just from the gastrointestinal tract, but from any suspected sites of infection. The inside of a reptile's body is not necessarily a sterile place, and a culture of bacteria from within the body can help the veterinarian to determine if infection was the cause of death, or a secondary problem. This assessment is based on the type of bacteria, their location and their relative numbers.

Certain anatomical features are common to all animals and others are peculiar to reptiles or to a given group or species of reptile. For example, the kidneys of a snake are segmented and layered, in a flat, shingled sort of arrangement, and are located about 2/3 of the way down the body, one after the other. By contrast, the kidneys of the Green Iguana are more like a bean in shape and are normally located within the pelvis. Lungs and digestive tracts are also highly variable between groups of reptiles. Normal liver tissue is by and large similar in appe8iance to the naked eye. Given the vast range of normal and abnormal variation in the appearance of organs and tissues within roe species, as well as between species of reptile, almost every necropsy will add to a veterinarian's knowledge base.

Regardless of the species, certain findings are always abnormal and can be seen without magnification: an enlarged heart, internal bleeding due to trauma, a blocked intestine leading to death of the digestive tract wall. It can be a mistake, however, to stop at the first sign of disease, and call it a diagnosis. White spots oo the surface of the internal organs are often gout, and a swollen, pale liver often are shown to have excessive fat accumulation. An enlarged, abnormally textured ovary may be infected or cancerous, however, and certain bacterial and fungal infections can look very much like cancer. Cancerous organs very commonly become infected. Even if one can with some experience make an educated guess at the nature of the disease process. it is never possible to be sure without further tests. All too often, our reptile patients have experienced more than one problem, and a complete necropsy lessens the chance that something will be missed.

During the gross post mortem, your reptile veterinarian will likely take samples. Mast commonly these include skin, liver, kidney, gastrointestinal tract, spleen, ovary or testicle, pancreas, lung and heart. He may also sample muscle, brain or other nervous tissue, bone, bone marrow, bladder and reproductive tract.

He may also take a sample of any discharge or foreign body, or tissue, which he cannot identify. Samples may be processed in a variety of ways, depending on the nature of the sample and the disease process being investigated. In some cases a direct impression of the cut surface of the tissue, pressed on a glass slide leaves bacteria, parasites or distinctive cells, which may yield a diagnosis when processed and examined under the microscope. Typically, tissue or organ samples are placed in formalin for preservation and sent to a laboratory for histological analysis. Histology is the study of tissue at the microscopic level.

At the laboratory, these tiny pieces of preserved tissue will be sealed into wax blocks, which are then sliced into layers just a cell or two thick. These layers are thin enough to allow light to pass through them. They are then fixed oo a glass slide, to be examined by a pathologist under a microscope. In some instances, special stains are applied to the tissues. These stains highlight features such as intracellular (within the cell) parasites or bacteria. In some cases, a mere highly specialized procedure, electron microscopy, is performed. This allows examination of structures within the cell itself and can even allow particles as small as viruses to be seen. Virus isolation from tissue samples is possible in some instances, as some viruses can be grown and identified in the laboratory.

THE LIMITATIONS OF A NECROPSY

If you decide to have a necropsy performed, the body of the reptile should be submitted to your veterinarian as soon as possible after its death; it should be kept cool, preferably at refrigerator temperature. If the necropsy cannot be performed for mere than 48 hours, the body should probably be frozen. In the hours after death, the cells of the body begin to degenerate. This happens mere quickly at higher temperatures. Bacteria within the body, particularly the high concentrations found in the digestive tract will continue to live and divide, further accelerating decomposition. Cooling slows decomposition of tissues. Freezing, although it prevents decomposition, is not ideal. As sharp ice crystals form from the water within the body, they tear delicate cell walls, distorting the microscopic appearance of tissues.

Sidney ANIMAL HOSPITAL
9842 Second Street; Sidney, BC Canada V8L 3C6
T: 250-656-3333 W: www.sidneyanimalhospital.com
E: sidneyanimalhospital@shaw.ca

Not every cause of death will be revealed by even the most in-depth necropsy. There are many reasons for this, and veterinarians find it just as frustrating as owners do to be unable to explain or understand the death of a pet. Sometimes the cause of illness or death would have been revealed if a given test had been performed oo the animal while it was alive. For example, electrical malfunction of the heart may not be detectable when the heart is examined at necropsy. It may or may not have been evident in tests when the animal was alive. Sophisticated tests such as MRI (magnetic resonance imaging) are available in only a few places, and may be cost prohibitive. In some cases an-reptile patients are too small for the tests we would like to perform. In other cases, the tests do not exist for reptiles as they do for dogs, cats and people. Some disease processes are not fully understood and others have doubtless, yet to be identified. 1here is a great deal to learn yet in the field of reptile medicine, and the more we apply science and medicine to the care of reptiles, the better that care will be.