

PHYSICAL EXAMINATION OF REPTILES AND AMPHIBIANS

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Waiting Room Recommendations

All reptiles must be presented in appropriate escape proof containers. Snakes should be confined in snake bags or pillow cases that are secured with a knot. Large pythons may be transported in ice coolers that have a locking hinge; the drainage vent must be open to permit ventilation. During the colder months clients should be instructed to keep their reptiles warm (27°C/80°F) during transport to the hospital. Chelonians (turtles and tortoises) may be transported in appropriately sized boxes. Small and medium sized lizards should be brought in cloth bags or plastic containers. Large iguanas and monitor lizards may be placed in duffel bags and then put in cat carriers. Amphibians such as frogs, salamanders, etc., may be transported in appropriately sized plastic containers to which water or a moist substrate (sphagnum, peat moss) has been added. Reptile owners should be advised not to display their pets in the waiting room as other clients may find the experience disconcerting. If you know it will take more than 15 minutes before examining the reptile, a technician should place it on or near a heating source in a cage. Heating pads or heat lamps work well.

The waiting room should communicate to the owner that your practice is familiar with treating reptiles. Advanced Vivarium Systems, Lakeside, CA, 92040, publishes a series of booklets describing the captive husbandry of various reptiles and amphibians that are commonly maintained in captivity. Displaying these booklets in conjunction with photographs and posters of assorted reptiles enables the first time client to feel comfortable and learn about their pets while waiting to be examined. Poisonous reptiles should only be seen by veterinarians who are experienced in handling venomous species. Special precautions must be instituted for transporting and handling these dangerous reptiles. One should have an emergency hotline to the nearest human hospital that stores antivenom.

First time appointments should be given a minimum of 30 minutes. The veterinarian should be notified by the receptionist the type of reptiles being examined to be certain you are familiar with that particular species. It is strongly recommended that any veterinarian seeing reptiles should maintain some specimens as pets or for breeding purposes. Most problems with reptiles are due to poor husbandry practices.

Basic Examination Instrumentation

- gram scale
- rubber spatulas
- sexing probes
- spray bottle filled with alcohol
- rubber gloves
- ball-tipped needles
- heating pad

Anamnesis

Before the reptile or amphibian is examined, a thorough history must be obtained. Many times the problem can be accurately identified from the history alone. Anamnesis should include a discussion of captive conditions such as enclosure size, substrate type, temperature range during day and night, humidity levels, diet, frequency of feedings/defecation, color/consistency of feces, frequency of water bowl changes, presence of cagemates, hot rocks, hide boxes, etc. Clients should be encouraged to maintain cage cards noting date/source of acquisition, captive bred or wild caught, feeding/defecation frequency, shedding dates, periodic weight and any prior disease(s). One can see the importance of being familiar with the recommended husbandry conditions so as to identify associated problems. Maintaining history questionnaires in the waiting room for the client to complete will save time during the office visit.

Physical Examination

One should first observe the reptile before beginning the examination. Is it alert and responsive with a normal posture? Is the respiratory cycle normal? Are there any obvious swellings or injuries? Debilitated snakes are thin and have loose skin folds parallel to the spine. The ribs may be prominent. Malnourished lizards display bony protuberances especially around the pelvic girdle. Depleted fat deposits in the tail with prominent coccygeal vertebrae signify cachexia. Starving chelonians have sunken eyes and appear hollow in the axillary and inguinal pockets. They feel light in weight in comparison to their size. Dehydration is assessed by reduced skin turgor and sunken eyes.

Snakes should be initially grasped behind the head and lifted midbody with the other hand. Iguanas should be supported under the front and rear legs, stabilizing the head between the thumb and index finger. Handling large snakes requires the assistance of several people for adequate restraint. The marine toad (*Bufo marinus*) possesses cutaneous parotid glands that secrete bufotoxin which is readily absorbed through mucous membranes; accordingly, examination gloves should be worn when handling them. Intractable reptiles may need to be sedated to permit a thorough examination. Snake bites leave small puncture wounds which bleed freely. Large boids and pythons can inflict lacerations requiring stitches. Monitor lizards hold on with tenacity and have to be dislodged by spraying alcohol in their mouths. All reptiles should be weighed using the metric system. Some are naturally flighty

such as water dragons (*Physignathus cocincinus*) and basilisks (*Basiliscus plumifrons*). Others such as bearded dragons (*Pogona vitticeps*) and prehensile-tailed skinks (*Corucia zebrata*) tend to be more docile. Examples of nervous snakes are racers (*Coluber constrictor*) and tri-colored milksnakes (*Lampropeltis triangulum*). Tortoises tend to be shy and lethargic while water turtles such as red-eared sliders (*Chrysemys scripta elegans*) are very active.

The general examination should commence with the head and proceed caudally. Rostral scales of snakes and lizards are often traumatized due to rough edges in the cages, persistent disturbances causing flight reactions, lack of a hide box or aggression with incompatible cage mates. Snakes can be seriously injured by live rodents that are left unattended in the cage. The nostrils should be patent and free of discharge. Green iguanas (*Iguana iguana*) have salt glands that communicate with the external nares; thus, occasional sneezing and subsequent build-up of dry, white secretions around the nostrils is a normal finding. Some tortoises excrete excessive sodium via ocular glands causing physiologic epiphora. The eyes should be bright, alert and free of exudate. Snakes have no eyelids; instead, their eyelids have fused to form a single scale called a spectacle which covers the cornea. Diurnal reptiles usually have large round pupils; nocturnal ones have vertical pupils. Unlike other reptiles, snakes shed their skin in one piece. Prior to shedding, their body takes on a milky hue which is due to lymph like fluid being produced between the old and new layers of skin. The eyes also become opaque at this time. In addition, check for discoloration, wrinkling, hemorrhage, or bulging of the eyes. Tree frogs which normally consume invertebrates develop corneal lipid dystrophy when fed a diet high in fat such as newborn mice (pinkies). Wrinkled or retained spectacles develop secondary to low ambient humidity. Exophthalmos is due to blockage of the harderian gland, abscessation or neoplasia. The snake mite (*Ophionyssus natricus*) congregates around the edges of the spectacles and gular fold. These are blood-sucking ectoparasites that transmit viruses, blood parasites and pathogenic bacteria. Dorsal and ventral surfaces of reptiles should be examined for evidence of dermatitis, injury, etc. Lizards shed their skin in patches. Chelonians shed their scutes individually. The plantar surfaces of the appendages should be checked for abrasions secondary to inappropriate substrate. The spine and extremities should be palpated for indentations, swellings, or softness due to fractures, abscesses or metabolic bone disease (MBD). Generalized tetany is observed with hypocalcemia, hypoglycemia or neurologic disease. A head tilt and/or strabismus is consistent with vestibulopathy. Snakes have no external ears; chelonians, lizards and amphibians possess a tympanum. Swelling of the tympanum is commonly seen in turtles and is secondary to middle ear abscesses. Pigmentation of the tongue is normal in some lizards such as the blue-tongued skink (*Tiliqua gigas*). Green iguanas have a reddish tip on their tongues while bearded dragons have yellow-tinged mucosa. Other reptiles have melanin deposits in the oral cavity to enhance absorption of heat such as the savannah monitor (*Varanus exanthematicus*). Some boids possess labial pits which are cavities located in or between the labial scales that are heat sensitive to assist in locating prey. The mouth parts of chelonians are susceptible to overgrowth due to the consumption of nonabrasive food in captivity. The mouth should be opened carefully to avoid damage to the delicate oral mucosa. Appropriately sized rubber spatulas work well. Iguanas, water dragons and basilisks may gape as a defensive display making the oral exam easier. The oral cavity should be free of any swellings, exudate,

petechiae or bubbles. These symptoms are consistent with stomatitis, septicemia or pneumonia. In snakes the glottis is located in the anterior part of the mandible while in lizards, chelonians, and amphibians it is in the larynx. Soft, pliable jaws (except in snakes) are secondary to MBD; however, the Florida soft-shelled turtle (*Trionx ferox*) normally has a soft carapace and plastron.

Auscultation can be challenging. A moistened gauze pad may be placed between the diaphragm of the stethoscope and skin to diminish background noise. In snakes, the heart is located one third down the length of the body. Its contractions may be visualized when the snake is placed on its back and viewed from the side. In lizards, the heart may be auscultated on the ventrum either between or posterior to, the brachial girdle. Chelonians are difficult to auscultate due to the presence of their shell; however, the respiratory cycle may be assessed by observing normal subtle movements of the forelimbs, the presence of open-mouth breathing or wheezing. Turtles suspected of having pneumonia may be observed for even-sided buoyancy by placing them in water.

Palpation of the abdomen is an important aspect of the physical exam and an understanding of general anatomy is essential. A snake's body may conveniently be divided into quarters. The first quarter contains the trachea, esophagus and heart. The second quarter contains the heart, lung, liver and stomach. The third quarter contains the spleen, pancreas, gonads, adrenal glands and small intestine. The fourth quarter contains the kidneys, colon, cloaca, cloacal opening (vent), musk glands and paired hemipenises in males. A healthy snake has firm abdominal musculature that resists digital palpation. Any visible abdominal swelling(s) should be correlated with the organs found in the corresponding regional quarter. Abnormalities associated with coelomic masses include abscesses, intestinal blockages, tumors, etc. In lizards and chelonians, the kidneys are recessed within the pelvic girdle and therefore are normally not palpable. The liver is variable in position depending on the genus; however, it usually extends from the brachial girdle to the edges of the ribs. In snakes, the gastrointestinal tract may be palpated for gas, swellings or foreign bodies. In chelonians, palpation is most rewarding when the coelomic cavity is examined through the inguinal pockets. These are the fossae anterior to the posterior limbs. Using the index finger, eggs, enlarged kidneys, cystic calculi and intestinal impactions can be palpated.

The cloacal opening is an essential area to examine in reptiles. Snakes have no urinary bladder and their normal waste products consist of feces and amorphous urates which are yellow in color. The accumulation of excreta around the cloacal opening (pasty vent) indicates enteritis. Lizards, chelonians and amphibians have a urinary bladder. The cloaca is divided into three compartments: a) copradium--receives fecal material from the colon, b) urodeum--receives urates from the ureters and products of conception from the oviducts, and c) proctodeum--storage vat for feces/urates and absorption of water. Posterior to the cloacal opening are the musk glands and paired hemipenises in snakes and lizards. Chelonians have a single penis which is retracted anterior to the vent.

Sex determination is commonly requested by reptile owners. In general, it is more difficult to visibly sex hatchling and juvenile reptiles because sexual dimorphism becomes more

apparent with age. In snakes, sex determination is most accurately performed by the utilization of sexing probes which are available in various sizes depending on the size of the snake. They are made of stainless steel and blunted at the ends. Prior to insertion, the probe should be moistened with tap water. In snakes, each hemipenis is inverted into the tail. The lubricated probe is directed caudolaterally into the hemipenal sulcus. The paired musk glands have ducts that are located medially to the hemipenises. Probing these structures in a male snake will cause one to incorrectly identify the snake as a female. In females, the probe slides to a depth of two to three subcaudal scales and in males the probe reaches ten to fifteen scales. It is important to be gentle when performing this procedure as perforation of the musk glands or hemipenises can lead to infection. It is best to probe both hemipenal pockets to confirm male gender. In boids, males have larger pelvic spurs. These are claw like appendages that are vestiges of the pelvis used to stimulate the female prior to copulation. In lizards, such as bearded dragons, monitors and skinks, sex determination is most accurately accomplished by manually prolapsing the hemipenises under general anesthesia. Radiography may demonstrate calcified hemipenal spines in varanids (monitors). Sexual dimorphism in certain species may preclude these procedures. Mature male lizards such as iguanas, basilisks, anoles and chameleons have larger dewlaps, dorsal spines, head ornaments and change color during breeding season. Hemipenal bulges at the tail base may also be prominent in males. In turtles, males generally possess longer tails with the cloacal opening posterior to the edge of the supracaudal scutes. They also have a concave plastron to facilitate copulation. In box turtles, males commonly have red irises while females have brown irises. Male leopard (*Geochelone pardalis*) and red-footed tortoises (*Geochelone carbonaria*) have V-shaped anal plastrons. Some aquatic turtles have enlarged front toenails that are used in courtship. Many male anurans (frogs and toads) have nuptial pads present on the thumbs, chin and chest. These are areas of roughened pigmented epithelium that permit maintenance of a firm grasp on females during amplexus (copulation). Male frogs tend to be more vocal, utilizing mating calls during breeding season.

Although captive bred reptiles are becoming more available through private breeders there are still many wild caught imports. The two most common types are ball pythons (*Python regius*) and juvenile iguanas. The hatchling iguanas are farm raised imports from Central America that are hatched from gravid females captured in the wild and later released after ovipositing. All ball pythons and iguanas are heavily parasitized. These species should be empirically dewormed during the first office visit. Ball tipped needles work well for this purpose, especially in hatchlings.

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