

Routes of Administration of Medications to Reptiles

Our topics for this week include:

- **Injection of medications in reptiles**
- **Oral administration of medications to reptiles**

Most medications to reptiles are given by injection rather than by mouth. Injections are preferred in larger reptiles due to danger to handlers when handling a reptile's head and mouth.

For injections other than intravenous to be effective, the animal must be well hydrated and at a preferred temperature for normal activity for its species. Routes for injections are intramuscular, subcutaneous, intracoelomic, intravenous, or intraosseous.

Injections

Insertion of transcutaneous needles for injection or aspiration in reptiles carries the risk of slashing tissue beneath the skin, including damage to nerves and blood vessels, and breaking hypodermic needles off in its body. The area in which the needle is to be inserted must be immobilized and the reptile's mouth and feet should be restrained from interfering with the procedure, especially venipunctures.

Venipuncture

Veins that can be accessed in chelonians include the jugular vein, brachial vein, dorsal and ventral coccygeal (tail) vein, femoral vein, and subcarapacial (beneath the shell) vein, found on midline just under the carapace (upper shell) above the retracted head of the turtle. The jugular vein on the right side is preferred for turtles and dorsal vein of the tail is preferred for tortoises. The head must be captured and extended to access the jugular vein.

The vein used for venipuncture in snakes is the ventral coccygeal vein caudal to the vent on midline of tail. Chemical restraint may be necessary. In anesthetized larger snakes, the palatine vein in the roof of the mouth can be accessed.

Restraint for venipuncture in lizards may be assisted by using cotton balls over its eyes and using self-adherent elastic bandage loosely wrapped around the head to hold the cotton in place.

The ventral coccygeal (tail) vein is often used in lizards and accessed with the lizard held ventrodorsal (on its back). However, use of the ventral coccygeal vein can be hazardous in restraining lizards with autonomous tails. The ventral (central) abdominal or jugular vein can be accessed after chemical restraint and ventrodorsal positioning, but hematomas often occur afterwards.

Intramuscular Injections

Intramuscular (IM) injections are the most common method of drug administration to reptiles.

It has been traditionally believed that IM injections, given in the hind limbs or tail, are absorbed and carried to the renal portal system, resulting in more rapid elimination from the body and uneven distribution in the body. Injections in the front half of the body of reptiles have been preferred. Although evidence is lacking for clinically significant first pass elimination of drugs by the renal portal system in all cases, most veterinarians still make IM injections in the front half of the body of reptiles.

In chelonians, IM injections are usually given in the upper (proximal) forelimb. Although less convenient, the pectoral muscles at the junction of neck and forelimb can also be used. The hindlimbs may be used but the medication dosage may need to be increased.

Snakes are administered IM injections in the dorsal muscles of the back in the front one-third of body. Injections should be performed by angling the needle toward the head and inserting the needle underneath scales, not through them.

No restraint or hand restraint of the head may be needed.

When full body restraint is needed, a squeeze box can be used. A squeeze box for snakes is a box with a removable top. A removable mesh wire top can be lowered down into the box to gently press the snake down for an injection through the mesh.

The deltoid muscles of the shoulders are preferred for IM injections in lizards. The forearm muscles of large lizards may also be used. Chameleons and small geckos do not have sufficient muscle for IM injections.

Subcutaneous Injections:

Subcutaneous (SC) injections are not often administered to reptiles.

When they are, the injection in chelonians is given in the ventral neck flap or under the skin cranial to the fore- or hind-limbs. In snakes, the injection is given in the cranial one-third of the body in an epaxial (dorsolateral) area. As with IM injections, the needle should be angled toward their head and the injection made underneath, not through, the scales. Lizards are given SC injections in an epaxial thoracic area.

Intracoelomic Injections

Intracoelomic (IC) injections are uncommonly used in reptiles. Reptiles do not have a diaphragm, so their body cavity is unlike the chest and abdominal cavities of mammals. IC injections can cause compression of their lungs and there is risk of puncturing or cutting an internal organ in the injection needle.

When IC injections are given to chelonians, they are administered through the caudal skin folds where they attach to the bridge (junction on their sides between the upper and lower shell).

In snakes, IC injections are given in the lateral part of body just dorsal the ventral scales and in front of the cloaca in the caudal one-fourth of its body.

Lizards are placed in ventrodorsal recumbency (on their back) with their head tilted downward. The injection is given in the caudal one-third of the body. The midline should be avoided due to the risk of penetrating the ventral abdominal vein.

Intraosseous Injections

Intraosseous (IO, inside a bone) injection should only be done in reptiles after they are radiographed to check bone density. If they have metabolic bone disease, an IO puncture is likely to fracture the bone.

Injections in chelonians are given either at the junction between the plastron and carapace just cranial to a hindleg or into the tibial crest.

Intraosseous injections are not possible in snakes.

In lizards, IO injections are performed on the proximal femur (entered between hip joint and greater trochanter) or the distal femur (entered at stifle joint). The proximal tibia may be used in larger lizards. The point of injection is at the tibial crest.

Administration of Oral Administration

Giving drugs to reptiles by mouth can be hazardous to handlers due to the risk of being bitten or difficult due to the resistance of the reptile, particularly chelonians. Oral medication is used more often in lizards than in snakes or chelonians.

If possible, the best method of oral medication to reptiles is to apply the medication on or into food. The amount of food should be limited to ensure the likelihood the reptile will consume the medicated food.

In some cases, an oral syringe with a metal ball-tipped gavage needle or rubber feeding tube can be placed in the corner of the mouth and the medication delivered slowly.

Oral administration of medications with a lubricated feeding tube can be safe for the reptile, if care is used to open a reptile's mouth with a wooden spatula or popsicle stick. In some cases, the lower neck flap (dewlap) can be pulled gently to open the mouth.

It is relatively easy to avoid the glottis (opening to the windpipe). The glottis in snakes is located in the front of the mouth. This allows the snake to have its mouth stuffed with a meal and still breathe. It is at the base of the tongue in lizards and chelonians.

If a feeding tube is inserted too far, the stomach may be reached which can be hazardous to the reptile. The length from mouth to stomach should be estimated beforehand. In chelonians, the appropriate distance is from the nose to the junction of pectoral and abdominal scutes. Scutes are plates in the shell of chelonians. In snakes, the distance is one-third of its body length. In lizards, it is one-half the body length

If you have comments or you're interested in particular animal handling subjects contact us at CBC@BetterAnimalHandling.com

Now let's recap the key points to remember from today's episode:

- 1. Injections are the preferred method to administer medications to reptiles.**
- 2. Intramuscular injections in reptiles are generally administered in the front half of a reptile's body.**
- 3. Before administering oral medications through a feeding tube to reptiles, the distance from the mouth to the stomach should be known and not exceeded with the end of the tube.**

More information on animal handling can be found in my recent books, *Animal Handling and Physical Restraint*, *Concise Textbook of Small Animal Handling*, and *Concise Textbook of Large Animal Handling* all published by CRC Press and available on Amazon and from many other fine book supply sources.

Additional information is provided at: www.betteranimalhandling.com . This website has more than 150 past podcasts with notes on handling of dogs, cats, other small mammals, birds, reptiles, horses, cattle, small ruminants, swine, and poultry.

Don't forget, serious injury or death can result from handling and restraining some animals. Safe and effective handling and restraint requires experience and continual practice. Acquisition of the needed skills should be under the supervision of an experienced animal handler.