

Care Cards

Infectious Stomatitis

Infectious stomatitis is known by many names within the herp community such as mouth rot, ulcerative stomatitis, and mouth canker. Infectious stomatitis is not a primary disease. The condition is usually the result of poor husbandry by the owner, resulting in excessive stress to the animal. Stress will suppress the immune system making the reptile more susceptible to disease. Disease causing agents that a healthy reptile would normally fend off will have an opportunity to penetrate and replicate within the stressed reptile's body. The most commonly isolated bacteria associated with infectious stomatitis are *Pseudomonas*, *Aeromonas*, *Klebsiella*, and *Salmonella*. Other infectious organisms associated with infectious stomatitis include viruses, fungi, and Mycobacteria.

Common husbandry problems include overcrowding, low environmental temperatures and poor nutrition or diet. Poor diets or improper levels of vitamins, minerals and protein will have a negative effect on the condition of the body tissue. This debilitation will result in a physiological stress on the body and a decrease in the overall immune function. Below normal levels of ascorbic acid (vitamin C), have been implicated in several research articles to play a role in the development of infectious stomatitis in reptiles. Nutritional secondary hyperparathyroidism, one form of metabolic bone disease, is one of the most commonly diagnosed medical conditions in reptile medicine. Some affected animals will develop malformations in their jaw architecture. This can lead to exposure of the gingival surface to bacteria that can further develop into infectious stomatitis.

Mites can contribute to the development of infectious stomatitis in reptiles. Mites are hematophagous and a reptile infested with them will become weak from the blood loss. Mites can also transmit pathogenic bacteria such as *Aeromonas*. These factors will allow

the disease to develop. Trauma can also lead to infectious stomatitis. Caged reptiles are commonly observed rubbing their face or rostrum on the cage surfaces. The resulting abrasions are an open door for bacteria and infection.

In the early stages of the disease, the gingival tissue will become reddened in color. As the infection progresses, hemorrhages will develop and the tissue will become swollen and edematous, leading to inflammation of the oral mucosa. If the infection remains localized between the gingiva and the skin, it can become an abscess. If the infection is allowed to spread to the deeper jaw tissue, osteomyelitis will occur. This will result in severe destruction of the bone, leading to severe pain and a loss of teeth. As the disease process continues, many affected reptiles will aspirate or inhale the pathogens into their airways, leading to pneumonia. In other cases the infection will spread to the eye and surrounding area resulting in a possible loss of vision if not treated aggressively.

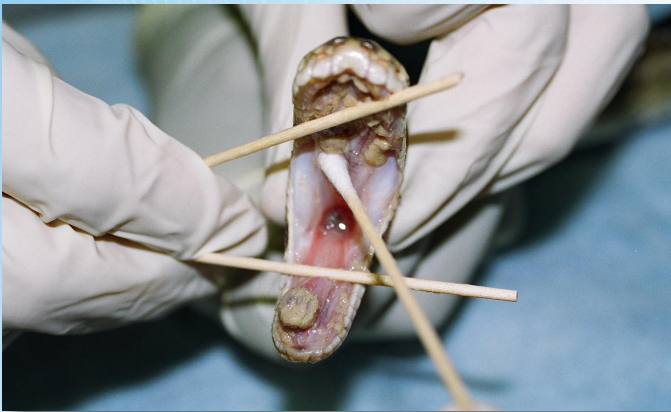
Normal clinical signs associated with infectious stomatitis include anorexia, excessive salivation, open mouth breathing, weight loss, and in more severe cases a caseous exudate will be observed. If not treated correctly and promptly, infectious stomatitis can lead to systemic disease and possible death. Although snakes are the most commonly affected reptiles with infectious stomatitis, the condition can occur in any reptile.

Treatment is usually a combination of antimicrobial therapy for the primary lesions as well as correcting any underlying husbandry problems. If the husbandry problem is not identified and corrected, the disease will usually reoccur once treatment has been discontinued. If possible, affected tissue samples should be collected for bacterial culture and sensitivity testing. This will help ensure the use of the proper antimicrobial agent. In cases that

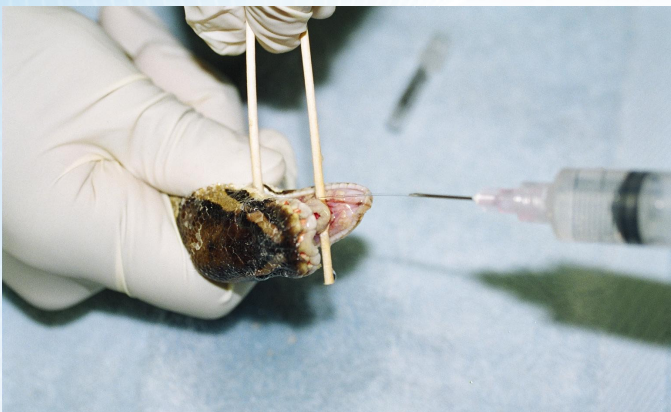




by simply correcting the underlying husbandry problem and increasing the environmental temperature. Minor bacterial infections may only require the use of a topical antimicrobial solution applied directly to the affected gingival surface. When using a topical product the reptile's cage substrate should be changed to either newspaper or butcher's paper to prevent the material from adhering to the medication. Water access will need to be restricted to help prevent the medication from being washed off. The most commonly used topical medications are ophthalmic solutions without steroids. In more advanced cases, the antimicrobial agent should be administered via injection to insure proper uptake by the affected tissue.



The use of oral medications should be avoided for two reasons. First, because the diseased reptile is already debilitated, it's ability to absorb and process oral medication will be limited. Second, you run the risk of inducing additional damage to the affected tissue from trying to force open the animals mouth to administer the medicine. Gram-negative bacteria are implicated in most reptile infections and the drugs of choice are aminoglycosides. These should be used with caution in any severely debilitated reptile due to their potential for nephrotoxicity. Renal function should be evaluated prior to their use in these cases. Most antimicrobial agents are not capable of penetrating abscess tissue. When abscesses are present, they must be surgically lanced and cleaned prior to the use of an antimicrobial agent. A chlorhexidine solution, diluted at 1:10 with saline can be used to flush the oral cavity. The reptile should always be held in a downward position to prevent aspiration during flushing.



are non-responsive to antimicrobial therapy, tissue biopsies may be necessary to identify the causative agent. Research in reptile physiology has shown that by increasing a reptile's body temperature you will cause a secondary increase in the function of their immune system, as well as an increase in the distribution of any medications administered. For this reason I always recommend increasing the environmental temperature of any sick reptile.

The level of treatment necessary will depend on the severity of the infection. Minor cases may respond

In severe cases, where bone involvement is diagnosed, two new treatment protocols are being tested. The first involves the use of an autogenous bacterin. These are formulated by culturing bacteria from the affected area. The bacteria are then killed and injected back into the reptile. The theory is that reptile will create a protective immunoglobulin against the bacteria, similar to the way other animals respond to inoculations. Early reports have shown that some bacteria,

such as *Pseudomonas*, create a better immune response than other bacteria, such as *Klebsiella*. The second protocol involves the use of antibiotic-impregnated polymethylmethacrylate beads. The antimicrobial agents of choice are aminoglycosides because they are heat-stable and effective against the majority of pathogenic bacteria in reptiles. The antimicrobial agent is mixed with the powder form of the polymer. After the agent has started to harden the mixture is placed on a sterile non-stick surface and rolled into beads. Some veterinarians are even molding the product to fit more evenly in different body regions. The beads are then implanted within the affected tissue and allowed to remain for an extended period of time. Eventually, the beads will need to be surgically removed from the reptile. These are showing great promise as a long-term treatment protocol because the implanted beads will provide prolonged use of the antimicrobial agent in a localized area and reduces any potential systemic side effects.

Reptiles heal slowly, and because of this it is important to treat any sick reptile long enough to ensure a proper recovery. If a treatment is stopped too soon, the disease may relapse. Occasionally when this happens, the bacteria will form resistance to the initial antimicrobial agent used resulting in an additional extension of the treatment time necessary for a complete cure. Tube feeding may be necessary to help maintain a positive caloric level in an affected reptile. Many types of food items can be blended into a slurry and then passed through a feeding tube. Prevention is the best treatment for infectious stomatitis. Proper housing and nutrition along with minimizing stress will significantly lower a reptile's chance for developing infectious stomatitis.

References:

- 1.) Frye, Fredric: Reptile Care; An Atlas of Diseases and Treatments, Volume 1. T.F.H. Publications. New Jersey, 1991.
- 2.) Mader, Douglas: Reptile Medicine and Surgery, W.B. Saunders Company, 1996.

