

Metabolic Bone Disease in Reptiles and Amphibians

What is metabolic bone disease?

Nutritional secondary hyperparathyroidism, or metabolic bone disease, is a common condition associated with abnormalities of the bones. This disorder is commonly associated with low dietary levels of calcium or vitamin D, an improper ratio of dietary calcium to phosphorus, and/or inadequate exposure to ultraviolet light (UVB) rays.

Metabolic bone disease (MBD) is most commonly seen in lizards, turtles, and tortoises, however disease can also be observed in amphibians and snakes.

What are the signs of metabolic bone disease?

Affected reptiles frequently exhibit signs of weakness or lethargy such as reluctance to move, decreased appetite, and weight loss. A host of additional signs can be seen in lizards and chelonians (Table 1).

Table 1. Additional signs of metabolic bone disease

Lizards	Turtles and tortoises
<ul style="list-style-type: none">• Pliable jaw bones• Swollen legs, swollen jaw• Leg fractures• Deviated spine or scoliosis	<ul style="list-style-type: none">• Soft or misshapen shell that may appear too small for the body• Uneven scute growth• Overgrown beak and nails

How will your veterinarian diagnose metabolic bone disease?

Dietary and caging history as well as physical exam findings can lead your veterinarian to strongly suspect MBD.

X-rays are often used to confirm suspicions, look for fractures, and assess your pet's response to treatment. Blood calcium and phosphorus levels can also prove helpful.

Every case of metabolic bone disease is unique & treatment varies, but can include...

- Handle your reptile carefully—as if they are made of porcelain—to minimize the risk of spinal injury or leg fractures.
- Provide strict cage rest. Confine your reptile to a small, confined space and take your pet out only to medicate or soak them.
- Remove unaffected cage mates from the enclosure.
- Provide an appropriate diet or slowly syringe feed as directed. Monitor fecal output closely and adjust the feeding schedule as needed.

- Provide calcium supplementation (free of vitamin D and phosphorus) as directed.

- Soak the reptile in lukewarm, “baby bath temperature” water for 15-30 minutes once or twice daily. Always monitor your weakened pet while they are soaking, and the water should only be half the height of the reptile.

- Ensure your pet has exposure to unfiltered sunlight (with some access to shade) or a full-spectrum ultraviolet light source that sits within 18-24 in (0.46-0.6 m) of the animal. Remember UV-B radiation is blocked or filtered by glass.

- Provide pain medication for fracture(s) as directed

References

Hoby S, Wenker C, Robert N, et al. Nutritional metabolic bone disease in juvenile veiled chameleons (*Chamaeleo calyptratus*) and its prevention. J Nutr 140:1923-1931, 2010.

Klaphake E. Metabolic bone disease in reptiles and amphibians. Vet Clin Exot Anim 13:375-392, 2010.