

Physiology

Speakers

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Case study. Fractures seem to occur more often in polar bears than in other ursids. Many fractures occur in cubs, and involve the radius and ulna. What is the most effective treatment option for these fractures? Could a Vitamin-D deficiency be a contributing factor?

Fractures in polar bears are not uncommon. Trauma—falling into moats, slipping on ice, slipping and falling between rocks—is the typical cause of a fracture. Cubs experience fractures more often, likely due to their immature bones and youthful play. The radius and ulna are the bones most often involved—and that may be due to the fact that a greater percentage of total body weight is borne by a polar bear's forelimbs. Surveying the treatment options and reviewing the results of 18 fractures in 11 animals, Lin suggested that internal fixation, rather than a cast, was the preferred treatment modality.

This study also considered whether vitamin and mineral deficiency (specifically, Vitamin D, calcium, and phosphorus) played a role in fractures. In captivity, Vitamin-D deficient sows may have Vitamin-D deficient milk. In addition, polar bears experience minimal synthesis of Vitamin D through the skin—so they are dependent on diet to meet requirements. Decreased Vitamin D plus lack of exercise can lead to decreased bone density/strength and can predispose a bear to fractures. In two out of the three zoos surveyed, polar bears had low levels of serum 25-OH Vitamin D. Lin suggests that Vitamin D supplementation may be warranted.

Celia Ackerman

Keeper, Central Park Zoo, New York, NY

Ackerman did a telephone survey of 39 North American facilities with polar bears, to determine whether there is a correlation between diet and coat concerns. The survey data included 48 male bears and 62 female bears. Polar bears in the surveyed zoos are being fed a diet that includes meat, fish, dry food (Mazuri Polar Bear Chow), and produce. They are also given Vitamin A, lard, and fish oil. Many of the zoos see seasonal fluctuations in appetite—lower appetite in Fall and Winter, and increased appetite in Spring and Summer. Only 9.6 bears ate consistent levels year-round.

Keepers were asked about coat concerns in their bears, and were given a response choice of None, Yes, or Thin Coat. Results were:

- None: 62 (32.30 bears)
- Yes: 35 (11.24 bears)
- Thin coat: 9 (3.6 bears)

Coat concerns occurred more frequently in females than in males.