

# FACTSHEET

## BISPHOSPHONATES

AUTHORED BY STACEY OKE, DVM, MSC; REVIEWED BY LAURA KENNEDY, DVM, DIPL. ACVP

### BISPHOSPHONATE USE IN HORSES

Learn about the pros (and potential cons) of these medications approved to help horses with navicular syndrome and other musculoskeletal disorders

**B**isphosphonates inhibit bone breakdown/resorption, making them useful for treating bone disorders such as podotrochlosis (navicular syndrome) in horses. In human medicine, patients with various bone fragility disorders, including osteoporosis, reap the rewards of bisphosphonate treatment.

In healthy animals, including horses, bone turns over continually. Cells called osteoclasts play a key role in breaking down old bone while another type of cell—osteoblasts—creates new bone. This natural process ensures bones remain strong and healthy and allows them to adapt to changes in exercise level or musculoskeletal system stress. Bisphosphonates bind to osteoclasts to block excess bone resorption.

#### BISPHOSPHONATES FOR NAVICULAR SYNDROME

Currently, only two bisphosphonates have garnered U.S. Food and Drug Administration (FDA) approval for equine use. Both products are licensed “for the control of clinical signs associated with navicular syndrome in horses.”<sup>1,2</sup>

Bisphosphonates appear to block osteoclast activity in horses with navicular syndrome, a common cause of chronic foot pain in horses resulting from the progressive degeneration of the navicular bone and its associated structures.<sup>3</sup>

Navicular syndrome has no cure, so current treatment options focus on controlling discomfort and potentially minimizing disease progression. Common management strategies include but are not limited to rest, corrective shoeing, and non-steroidal anti-inflammatory drugs (NSAIDs).<sup>4</sup> In many cases, these treatment options provide inadequate control over navicular syndrome. Prior to bisphosphonate availability, many horses suffering from navicular syndrome had uncontrolled discomfort, decreased quality of life, and were unable to compete at their owners’ desired level, leading to retirement and attrition.

The two FDA-approved bisphosphonates for use in horses are clodronate disodium (Osphos) and tiludronate disodium (Tildren).<sup>5</sup> Data support both products’ safety and efficacy in horses with navicular syndrome. The main difference between the two products is the administration route.

#### CLODRONATE DISODIUM (OSPHOS)

This bisphosphonate is administered intramuscularly. The dose is divided and injected into three distinct sites to minimize injection-site irritation or reaction.

Manufacturer studies showed that:

- ◆ On Day 28 after administration, 67.4% (60/89) of treatments were considered successes, defined as an improvement of at least one lameness grade and no worsening of lameness grade in the other forelimb on Day 56 post-treatment as compared to the pre-treatment



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Bisphosphonates can help horses with navicular syndrome and other degenerative conditions.

- assessment. Only 20.7% (6/29) of horses with navicular syndrome in the saline-treated control group demonstrated decreased lameness;
- ◆ On Day 56, 74.7% (68/86) of treated horses and 3.6% (1/28) of control horses were treatment successes; and
- ◆ At Day 180, 85% (51) of the 60 horses that were deemed treatment successes on Day 56 and were evaluable at Day 180 remained treatment successes; however, 35% (21/60) of those evaluable horses had an increase in lameness grade at Day 180 as compared to their Day 56 evaluation.

Including the 18 treatment failures at Day 56, the estimated overall success rate for Osphos at Day 180 is 65.4% (51/78).

Horses treated with Osphos successfully enjoyed relief of clinical signs for approximately six months. This product can be administered every three to six months based on recurrence of clinical signs of navicular syndrome.<sup>1</sup>

#### TILUDRONATE DISODIUM (TILDREN)

Tildren is formulated for intravenous administration. Research showed treatment success (if the lameness in the primarily affected limb improved by at least one grade and there was no worsening of lameness grade in the other forelimb at two months post-treatment compared to pre-treatment) in 63.87% of 119 horses treated with Tildren.<sup>2</sup> The maximum clinical effect does not occur immediately. Instead, clinical improvement typically occurs approximately two months after administration.

#### OTHER BISPHOSPHONATE USAGE: OSTEOARTHRITIS

Several recent publications suggest that bisphosphonates could also be useful in managing horses diagnosed with hip and back pain and/or osteoarthritis of the back (i.e., between the individual vertebrae or bones that make up the spinal column and protect the spinal cord).<sup>6,7</sup> Osteoarthritis, like navicular syndrome, currently lacks a definitive cure, and owners similarly rely on management techniques to help affected horses. Bisphosphonates could also help horses with osteoarthritis affecting other joints, such as hocks, although the evidence supporting this use is limited.<sup>6</sup>

#### BISPHOSPHONATE CONCERNS

Doctors have used nitrogenous bisphosphonates in humans for many

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years. Two rare but serious side effects in humans include atypical thigh bone fractures and jaw osteonecrosis (a condition in which, because of disrupted blood supply to the bone, bone breaks down faster than it can be produced).

Bisphosphonates used in horses are non-nitrogenous. To date, no published studies appear to have identified either femoral fractures or osteonecrosis as potential threats to horses receiving non-nitrogenous bisphosphonates.<sup>7,8</sup>

Some horses can experience certain adverse effects during and after bisphosphonate administration. With Osphos administration those can include clinical signs of discomfort such as pawing, yawning, and lip-licking, as well as colic.<sup>1</sup> Adverse effects associated with Tildren administration include colic, frequent urination, muscle twitching, and injection-site inflammation.<sup>2</sup> In studies associated with each of the drugs, most of the adverse events were self-resolving.

Bisphosphonates should not be administered concurrently with NSAIDs. Bisphosphonates can cause gastrointestinal and

renal (kidney) toxicity; NSAIDs also can contribute to kidney dysfunction and gastrointestinal ulceration, particularly of the stomach (both glandular and squamous portions) and right dorsal colon. Practically, this can be tricky, because NSAIDs are popular treatments for many painful conditions, including navicular syndrome and osteoarthritis.

Bisphosphonates aren't recommended for use in young and/or pregnant horses. The Fédération Equestre Internationale will begin prohibiting nitrogenous bisphosphonate use in horses starting in 2019.

## THE BOTTOM LINE

For the best possible outcomes, ensure your veterinarian has fully examined your horse and arrived at a clear diagnosis and that he or she has run bloodwork to confirm that your horse is otherwise healthy.


Report any treatment-related concerns to your veterinarian who, in turn, should report adverse effects to the manufacturer.

While concerns associated with bisphosphonates should be considered, appropriately treating horses with degenerative conditions can help improve their quality of life and maximize their lifespan.

## Resources

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