

Carprofen

BRAND NAME: CARPOVET, RIMADYL, NOVOX, VETPROFEN (ZENECARP IN THE U.K.)

AVAILABLE IN
25 mg, 50 mg & 100 mg
CAPLETS

BACKGROUND

Carprofen is a member of the class of drugs known as NSAIDs (non-steroidal anti-inflammatory drugs), the same class as such common over-the-counter remedies as Advil (Ibuprofen), Aleve (Naproxen), Orudis (ketoprofen), and Aspirin as well as more controversial prescription drug such as Celebrex (celecoxib) and Vioxx (rofecoxib). This class of drug is used for pain relief successfully in humans but the development of safe NSAIDs for dogs has only been achieved relatively recently and continues to be problematic in the cat. With the possible exception of aspirin, none of the human drugs listed above can be safely used in pets and even aspirin has its issues.

The problem with this class of drugs has been unacceptable (even life-threatening) side effects. Issues have in the past been related to:

- Stomach ulceration - even perforation and rupture of the stomach can occur. This is not only painful but potentially lethal.
- Platelet deactivation - platelets are the cells controlling the ability to clot blood and, as a general rule, it is preferable not to promote bleeding.
- Decreased blood supply to the kidney - this could tip a borderline patient in to kidney failure.

The veterinary profession had been in need of an NSAID that could effectively relieve pain without the above risks. Carprofen was developed in answer to this need.

Sparing COX-1 while inhibiting COX-2

This new plane of safety is made possible by new scientific knowledge. Inflammatory biochemicals responsible for the pain and inflammation we want to allieviate are produced by an enzyme called "cyclo-oxygenase 2." The goal is to inhibit this enzyme without inhibiting its counterpart "cyclo-oxygenase 1." Cyclo-oxygenase 1, abbreviated COX-1, is what is called a "constitutive" enzyme. This means it is involved in producing regulatory biochemicals (called "prostaglandins") which are important in maintaining the normal health and function of our bodies. We want to leave this enzyme alone. Cyclo-oxygenase 2, abbreviated COX-2, produces inflammatory biochemicals but also is important in regulating kidney blood flow and in some reproductive and central nervous system function.

In the past, NSAIDs could not distinguish the COX enzymes; they inhibited them both. With the development of "COX preferential" and "COX selective" NSAIDs, we can inhibit COX-2 and leave COX-1 alone. The introduction of COX-2 preferential NSAIDs has reduced stomach and intestinal side effects by 50% in humans and has made FDA approval of NSAIDs such as carprofen possible for pets.

HOW THIS MEDICATION IS USED

Carprofen is used in the treatment of pain either for short term or long term use. Carprofen can be given as one single daily dose or the daily dose can be divided such that half is given in the morning and half in the evening.

A dog that is potentially a candidate for long term use of carprofen should have a complete examination by the veterinarian, a screening blood panel to establish baseline biochemical values, and ideally some kind of recheck testing two weeks after starting carprofen. This is because most adverse reactions, unusual as they may be, occur within this initial time frame and it is important that they be recognized before they get out of hand. After this initial period, complete blood panels should be screened every six months, an important step with any medication for long term use, not just the NSAIDs.

Carprofen is approved only for canine use and was designed for long term use in dogs. Cats are more sensitive to NSAID side effects than dogs and require different pain relief regimens.

This drug should not be used in the cat.

Carprofen may be given with or without food. If a dose is accidentally skipped, do not double up on the next dose but simply give the dose when it is remembered and time the next dose accordingly.

SIDE EFFECTS

Stomach upset: vomiting, diarrhea, and/or appetite loss are the important side effects to watch for, especially in the three weeks or so after beginning long term carprofen. These symptoms can have multiple meanings so it is important to sort them out.

- Some dogs are simply sensitive to NSAIDs, despite the COX-preferential nature of carprofen described above. These dogs simply need nausea relief in the short term and a different pain management regimen after recovery.
- Some dogs have an unrecognized liver problem. Carprofen is removed from the body by the liver which means that the liver on carprofen has extra work. This is not a problem for a normal liver but a diseased liver could be tipped into failure from the extra load. This is why screening tests are so important prior to long term use.
- Another problem manifesting with upset stomach is an idiosyncratic hepatopathy (a liver condition that is not dose-dependent or predictable in any way). While this only occurs in 1 in 5000 dogs, it is a more serious problem which likely would require hospitalization.

If a dog on carprofen develops an upset stomach, discontinue the medication and report the problem to your veterinarian.

It is prudent to check liver enzymes (a blood test) to rule out the two liver side effect issues that could manifest with upset stomach.

There are several conditions that can be made worse by giving an NSAID (even a COX-preferential one). See the Concerns and Cautions section for details.

Stomach upset occurs in <2% of dogs taking carprofen but should be taken seriously to be on the safe side.

INTERACTIONS WITH OTHER DRUGS

Different drugs of the NSAID class should not be used together as the potential for NSAID side effects increases. This means greater chance of exactly what we had hoped to avoid by using a COX-preferential NSAID instead of a non-preferential NSAID: stomach irritation/ulceration, altered kidney function, inappropriate bleeding. For similar reasons, NSAIDs should not be used in conjunction with corticosteroid hormones such as prednisone, dexamethasone etc. A 5-7 day rest period is recommended when changing over to carprofen or to another NSAID from carprofen. Aspirin poses an exception due to its strong platelet inactivating abilities so 10-14 days is recommended when switching to carprofen from aspirin. Allow at least one week between prednisone and carprofen.

If carprofen is used concurrently with phenobarbital, it is especially important that appropriate liver monitoring be performed. (Our hospital recommends bile acids testing every 6 months for dogs on phenobarbital.) These two drugs interact such that neither may work well if they are used together.

ACE inhibitors such as enalapril or benazepril may not be as effective in the presence of carprofen (ACE inhibitors are used in the treatment of hypertension or heart failure). This is because ACE inhibitors depend on the dilation of blood vessels in the kidneys and such dilation can be interfered with by NSAIDs).

In 9% of all adverse reactions reported regarding carprofen, concurrent use with corticosteroids was reported.

CONCERNS AND CAUTIONS

Carprofen is available as a chewable tablet which is highly palatable to animals. This increases the potential for accidental overdose should a pet gain access to a large amount of chewable tablets. Keep chewable carprofen out of the reach of children and pets.

Carprofen has not been tested in pregnant or nursing females and thus is not recommended for use in such individuals, particularly since COX-2 is important in reproductive function.

Carprofen should not be used in dogs with pre-existing liver or kidney disease. In order to screen for pre-existing liver or kidney disease it is a good idea to run a blood chemistry panel prior to starting long term carprofen.

ANY DOG ON LONG TERM MEDICATION OF ANY KIND SHOULD PROBABLY HAVE BLOOD CHEMISTRY RECHECKS EVERY 6 MONTHS.

The blood pressure related side effects that have made COX-2 selective NSAIDs controversial in humans are not significant factors in canine use.

Carprofen should not be used in patients with pre-existing GI ulcerations.

Carprofen has been tested for safety in puppies as young as 6 weeks of age but not younger. It should not be used in puppies less than six weeks of age.

Last revised: 6/16/2020



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Additional drug and general pet care information can be found on our world wide web site:
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