

Steroids & NSAIDS: A Potentially Lethal Combination

Let me be crystal clear right from the get-go. A steroid (aka: corticosteroid, glucocorticoid) should rarely be given at the same time as a non-steroidal anti-inflammatory drug (aka: NSAID) prescribed at an *anti-inflammatory* dose. This is a well-established pharmacologic principle, but for some reason, it is also one I see violated on an almost daily basis. With so many alternatives to help keep patients as comfortable as possible, I'm perpetually flummoxed by this choice of treatment. Thus I'm writing this blog post so pet parents are aware of this important issue and can be proactive advocates for their fur babies.

One should note a steroid is often combined with an ***ultra low-dose (NOT an anti-inflammatory dose)*** of aspirin to treat certain diseases like immune-mediated hemolytic anemia (IMHA; <http://criticalcaredvm.com/immune-mediated-hemolytic-anemia>). To highlight the difference in doses in dogs:

- Ultra low-dose of aspirin is 0.5-1.0 milligrams per kilogram of body weight per day
- Anti-inflammatory dose of aspirin is 10 milligrams per kilogram of body weight up to every 12 hours

A combination of *ultra low-dose* aspirin and a steroid is OK and may help reduce the formation of potentially lethal abnormal blood clots. This statement isn't meant to confuse you, but to make you aware of this possible *acceptable* mixture of these two drug classes.

Here are the two most common scenarios I encounter:

1. A primary care doctor prescribes these drug classes together - perhaps they aren't familiar with the concept of avoiding mixing NSAIDs at anti-inflammatory doses with steroids or they just don't believe the research that has proven this combination is really bad. Most scarily, maybe they are just too busy to make sure they're not inadvertently making mistakes!
2. A family veterinarian prescribes a steroid (like prednisone) for a pet's specific

condition (like immune-mediated hemolytic anemia; <http://criticalcaredvm.com/immune-mediated-hemolytic-anemia>). While the pet is receiving this medication, his family believes their fur baby is sore from a fun and long afternoon playing fetch so they subsequently administer an NSAID (like aspirin) without first consulting a veterinarian. It is always very important to be upfront with your family veterinarian about medication(s) you give to your pet, even if you have done so without consulting him/her. Lying to your veterinarian can be lethal to your pet, so please remember honesty is always the safest policy (<http://criticalcaredvm.com/honesty-is-the-safest-policy>).

Several NSAIDs have been approved for use in dogs and cats, including:

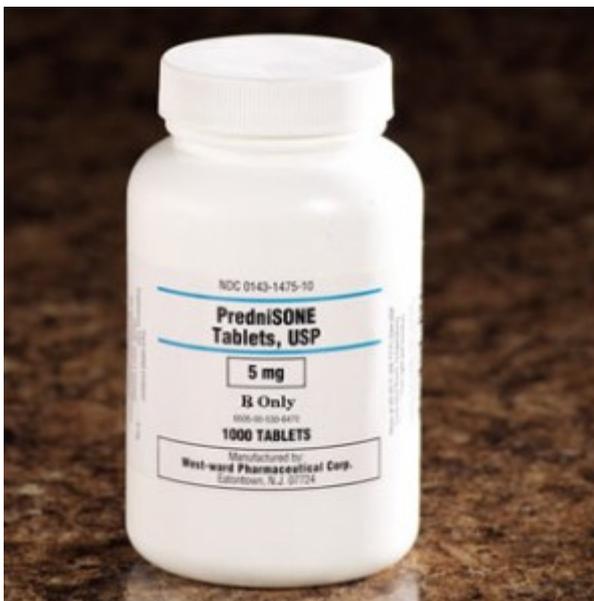
- Carprofen (Rimadyl)®
- Deracoxib (Deramaxx®)
- Meloxicam (Metacam®)
- Firocoxib (Previcox®)
- Robenacoxib (Onsior®)
- Tepoxalin (Zubrin®)





Common examples of steroids prescribed for both dogs and cats include:

- Prednisone
- Prednisolone
- Triamcinolone (Vetalog®)
- Methylprednisolone (Depomedrol®)
- Dexamethasone
- Cortisone
- Betamethasone
- Hydrocortisone
- Fluticasone
- Budesonide





How do steroids & NSAIDs work?

Inflammation is the body's response to irritation and/or injury, and is characterized by five classic signs:

- Rubor (redness)
- Calor (warmth)
- Dolor (pain)
- Tumor (swelling)
- Functio laesa (disturbance or loss of function)

Non-steroidal anti-inflammatory medications (NSAIDs) work by blocking the production of specific chemicals called prostaglandins that cause inflammation. This class of drug is very commonly used in dogs and cats to treated chronic inflammatory conditions such as osteoarthritis, and when used appropriately, can readily improve the quality of life for patients!

Steroids also suppress a patient's response to inflammation by affecting prostaglandin production. This additive effect can be very dangerous and potentially lethal. Why? Some prostaglandins are actually protective, especially in the gastrointestinal tract, kidneys and liver. When given concurrently with NSAIDs, blood supply to these vital organs can be severely compromised, potentially leading to acute kidney injury (AKI) and liver damage, as well as ulceration and/or perforation of the gastrointestinal tract.

What are the side effects of steroids & NSAIDs?

The most common side effect of NSAIDs is gastrointestinal ulceration resulting from inhibition of prostaglandin synthesis in the gastrointestinal tract. These medications also block the production of a chemical produced by platelets called thromboxane A₂, a potent inhibitor of platelet activation and aggregation. Lastly

NSAIDs also negatively affect the production of prostaglandins in the liver and kidneys, potentially resulting in decreased blood flow to these important organs. Given these side effects, NSAIDs are contraindicated in any patient with known or suspected liver or kidney disease, ulcerative gastrointestinal disease, low blood pressure and/or those with an increased risk of bleeding.

Steroids affect specific hormones in the body that lead to the conservation of salt in the body. Subsequently pets manifest excessive thirst and urination. Other common side effects of steroids include:

- Increased panting
- Increased appetite
- Hair coat changes
- Development of a pot-bellied appearance
- Predisposition to secondary infections (i.e.: skin, urinary bladder)
- Potential to develop diabetes mellitus (cats)

Veterinarians should obtain a thorough patient history and perform a complete physical examination for every patient prior to prescribing an NSAID or steroid. Additionally, specific blood and urine tests should be performed before administering these types of medications. In my experience, most primary care doctors forget or neglect to evaluate urine, and this is quite troublesome!

Kidney function can only be accurately assessed by looking at both blood and urine!

How do I keep my pet comfortable without steroids & NSAIDs?

Separately each of these classes of drugs can be very potent anti-inflammatory medications, and thus can help improve a pet's comfort level. But remember:

NSAIDs at anti-inflammatory doses and steroids should rarely be given together!

There are many different modalities for treating both acute and chronic pain in dogs and cats, most notably:

- Other pain medications besides NSAIDs and steroids
- Acupuncture
- Rehabilitation therapy
- Laser therapy

Your pet's primary care veterinarian should be able to guide you as to the best pain medication(s) and treatment modalities for your fur baby. You may also find it quite helpful and empowering to consult with a board-certified veterinary surgeon, sports medicine and rehabilitation specialist and/or critical care specialist to ensure your pet receives optimal interventions.

What is the take-away message about steroids & NSAIDS?

Given how NSAIDs and steroids work in the body, a combination of *anti-inflammatory* doses of NSAIDs and corticosteroids is almost always contraindicated and should generally be avoided. This nasty mix can induce gastrointestinal bleeding and/or alter oxygen delivery to the uniquely important organs like the liver and/or kidneys. There are several alternatives for pain management in patients, and consultation with a board-certified veterinary surgeon, sports medicine and rehabilitation specialist, and/or critical care specialist may be invaluable to help ensure pets receive the best possible healthcare.

To find a board-certified veterinary surgeon, please visit the American College of Veterinary Surgeons.

To find a board-certified veterinary sports medicine and rehabilitation specialist, please visit the American College of Veterinary Sports Medicine and Rehabilitation.

To find a board-certified veterinary critical care specialist, please visit the American College of Veterinary Emergency and Critical Care.

Wishing you wet-nosed kisses,

cgb