

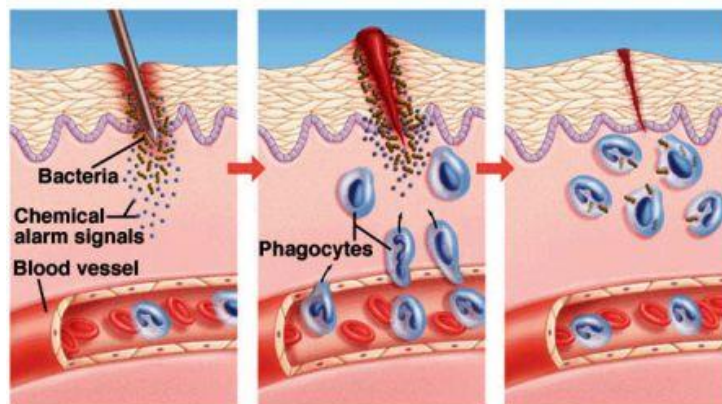
## What's in your medicine cabinet: a guide to the common horse drugs

Dr. Chris Bell BSc, DVM, MVetSc, DACVS

Have you ever had the call that your horse is colicky or been the stable owner/trainer that finds that horse rolling around his stall and pawing at the ground. What is the first thing that the horse is administered? Usually it is a medication called Flunixin meglumine (aka Banamine). The trouble is that it is often given without any regard for whether it is actually needed, without consultation with a veterinarian and with no knowledge of the potential side effects or how it works in the body.

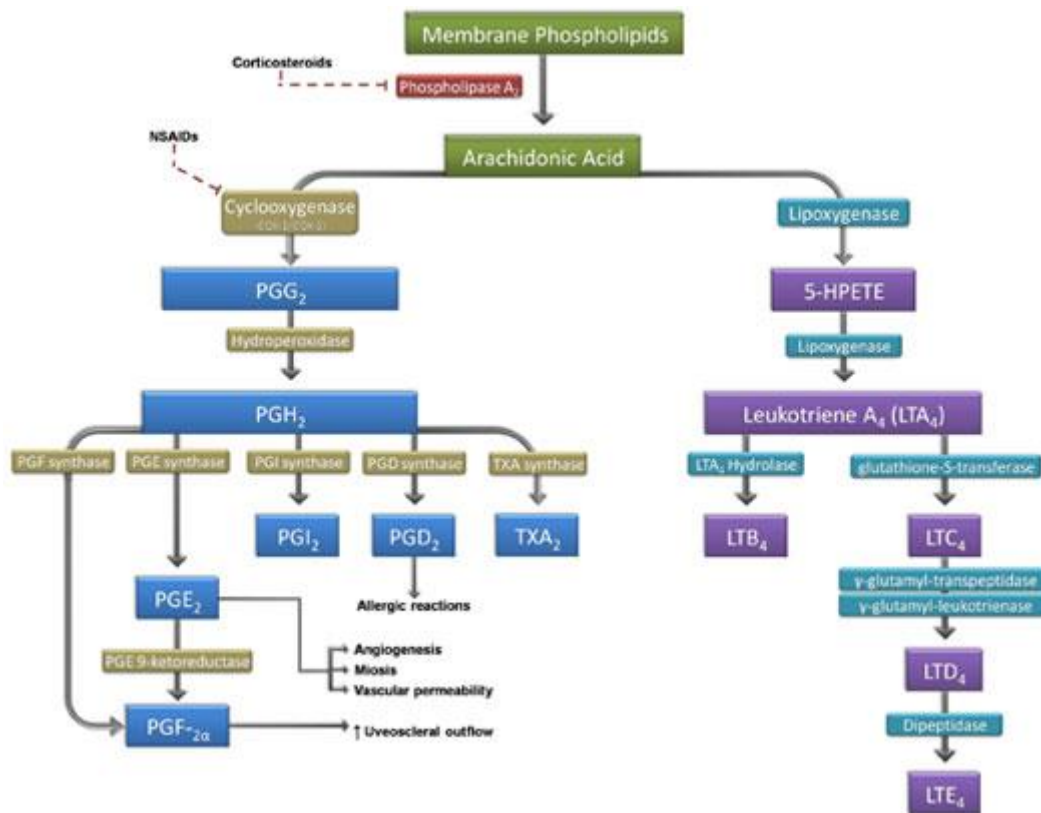
Since we began with the example of Banamine, let's review the topic of nonsteroidal anti-inflammatory drugs (NSAID's). This category will include all the most common medications that we use in horses for pain relief on a regular basis; phenylbutazone (Bute), flunixin meglumine (Banamine), Firocoxib (Previcox or Equioxx), ketoprofen (Anafen) and the list continues. These drugs as the name implies have a different effect than steroid based anti-inflammatories. To get further into that we must do a little biochemistry and physiology review. Pain and inflammation in the body are closely tied together. On physiological level, nerves sense pain responses and transmit that information to your brains for processing and the cells of the body react to the pain in various ways via transmission of signals between themselves. Closely associated with this response is inflammation. Inflammation occurs at the cellular and molecular level in the body. Cells interact with each other through the immune system primarily to create and modulate inflammation. The cells around an area of injury are recruited to begin dealing with the damaged tissues. In some cases such as a cut, these cells and their inflammatory mediators will only be needed for a couple days to weeks but in the case of arthritis in a joint, the cells may be recruited to the area of months or years.

The other part of the pathway involves the molecular level of inflammation. These are the chemical mediators that are produced, released, modified and squelched in the creation and resolution of inflammation. There are entire books dedicated to the various types of pathways and each of the little enzymes and molecules can constitute these pathways so we will not get into that level of depth. It is important to understand that these chemical pathways create the signals for cells to respond to the inflammation and can also create the signals or lack thereof to keep the cells from continuing to respond. These pathways are where many of the medication, used to control inflammation and pain, have their affect.



The big breakdown is between steroid and nonsteroidal effects. These inflammation pathways are like a cascading waterfall (Fig 1). As the molecular reaction to create in the inflammatory molecules begins, there are just a few enzymes involved and if you arrest those enzymes from doing their work then the entire waterfall is shut down – medications that work at this level of the cascade are called steroidal and the effects are widespread as all the other molecules that would have been created through the various cascades of the waterfall below are none arrested. Steroids can have profound anti-inflammatory effects but that also comes at the expense of some “good” molecules that would have been produced through the process as well. Examples of steroidal anti-inflammatory would be dexamethasone, prednisolone, methylprednisolone (Depo-Medrol/Vetacortyl), Triamcinalone (Vetalog/Kenalog) and betamethasone to name a few common ones. Nonsteroidal anti-inflammatories work similar to steroidal except that they are more limited in which part of the waterfall they block. NSAID’s tend to be less potent than steroidal but they are much more specific. For example, phenylbutazone is quite specific for general musculoskeletal pain, however, we all know about the possible side effects of Bute on the stomach and kidney’s in horses. So over the last 10 years there has been a focus on developing even more specific NSAID’s to block just musculoskeletal pain which leads us to the new generation of NSAID’s such as Previcox and Equioxx. These medications focus on the very specific parts of the cascade for anti-inflammatory effect on the musculoskeletal system and sparing the stomach, kidneys and colon to a greater degree.

Figure 1



Courtesy Vanderbilt Health Network

Why does all this matter to us as riders, trainers and stable keepers? It matters because no drug is innocuous and they all have some side effects and before you administer anything to a horse, you should understand what it is going to do and not do especially if you have decided to do so without veterinary advice. Banamine and Bute can cause or potentiate stomach ulcers and stomach ulcers can cause colic so if you administer and NSAID to a horse that is colicking from a stomach ulcer, you may make things worse rather than better. NSAID's potentiate bleeding as they have effects on the part of the cascade that partially regulates clotting of blood. If the horse with a cut in his leg is bleeding from that cut but you administer an NSAID for his pain, it could make the bleeding worse. Finally, and probably most dangerous, the use of Dexamethasone (which is very frightening available over-the-counter from most feed stores) for treatment of airway inflammation (heaves). As a potent steroidal medication, dexamethasone blocks the waterfall of enzymes very high in the cascade and some of the side effects of this include blockage of the immune system response to viral and bacterial infection. So if you misdiagnose a horse in your barn with heaves and before checking with the vet, you administer dexamethasone for a couple days, then a horse that started out with a mild pneumonia could degrade rapidly into a full fledged fulminant pneumonia with dire consequences. Since heaves and mild pneumonia look very similar initially, this simple decision to use a commonly available medication you have seen used dozens of times could be devastating. In addition, dexamethasone is documented to potentiate laminitis in horses and yet that warning is never given at the tack store when you're in to pick up some for your horse.

The method of injection is important as well particularly as it relates to Banamine. On the bottle, banamine is labelled for intramuscular or intravenous use, however, the general rule of thumb is to avoid intramuscular administration at all cost due to the potential for a side effect called clostridial myositis. This is a devastating condition where the muscle in the neck undergoes necrosis (muscle dies and rots off the horse). The reason for the necrosis is a bacterial infection that is initiated by injection of banamine into the muscle and activation of muscle bacterial spores that have lay dormant. There is no way to predict which horses will have these spores and treatment for the infection requires aeration of the muscle tissues via fasciotomies (cutting into the infected tissue throughout the neck or rump depending on where the medication was administered) (Figure 2). It can be deadly and equine veterinarians routinely advise against the intramuscular route of administration even in favor of not administering the drug at all until a veterinarian can do so intravenously instead.

Figure 2



The next category of drugs commonly found in any tack room or stable first aid box are the antibiotics. These are medications such as penicillin, sulfa-derived (aka TMS, Uniprim, Sulfa pills), excenel, gentocin and oxytetracyclines etc. Antibiotics are given to a horse to treat bacterial infections. Antibiotics have no effect on viral infection. This is important to understand as it is the reason why vets are becoming less and less likely to prescribe antibiotics to young horses with snotty noses. Viral infection typically run their course just as they do in humans and then the horse develops immunity. Rarely do the common upper respiratory tract viral infections warrant treatment in horses.

Antibiotics work by assisting the normal functioning immune system to decrease the number of bacteria present within the infected tissue (lung, gut, muscle, tendon, joint etc.). Antibiotics do not kill all the bacteria present in the infection rather they assist the immune system to make the infection manageable for the body to look after and clean up. This is the reason why sometimes one horse seems to respond better to an infection than another horse with the same infection and same antibiotic used – their immune system is the determining factor. As with any drug, antibiotics have positive effects and side effects. Some of the side effects are specific such as heat/sunlight intolerance or increased risk of developing a severe colitis. These need to be known about prior to pulling any antibiotic off the shelf. However, the biggest determining factor for which antibiotic to administer to your horse is almost always ignored whenever any rider, trainer, owner or stable manager decides which drug to use – what type of bacteria are you treating?

Each antibiotic is developed for a specific type or group of bacteria. Again there are books written on the subject but the basic principle is that the type of bacteria needs to be decided before administering an antibiotic. When veterinarians study bacteria in vet school, we are taught which type of bacteria occur commonly in which areas of the body and under which circumstances which is done to allow us to make an educated guess during the early phase of treatment and then we are to take swabs to confirm the diagnosis and ensure the correct antibiotic is chosen. The consequence of choosing wrong and not checking your decision with a swab could be deadly for the horse and at the least, detrimental to the

healing of the infected tissue. All antibiotics can have side effects as well which can compound the issue of incorrectly choosing an antibiotic without consulting a veterinarian. If you were to choose a sulfa medications for a leg wound that would have only responded to a penicillin, then the first problem would be that the bacteria will continue to grow and infect and secondarily, sulfa derived medications have a higher propensity for causing colitis in horses which can be deadly. Another dangerous side effect would be if you were to treat a young foal with Bayril (enrofloxacin) for his navel infection or a cough. First, the antibiotic may not have function against the bacteria and second, enrofloxacin will cause irreversible damage to the joint cartilage in young animals (horses, dogs, cats etc.). The consequences of self-diagnosing and treating the perceived problem can be very detrimental.

The other miscellaneous groups of medications in your drug box should be examined as well. Before you give anything to a horse, you want to make sure you understanding what is the meant to do and what the side effects may be for each drug. Sedatives are relatively common in the medicine cabinets and used frequently without consideration for their effects on the horse's body and when they may need to be used with more caution. Sedatives come in different potencies and thus dosages. Substituting one dosage for the other drug may result in a dangerous drop in blood pressure and possibly fainting of the horse. Occasionally, horses given xylazine (Rompun) can become aggressive including vicious biting and kicking at the people and horses around them. This is obviously the opposite effect to what is expected, however, it does occur and without appropriate reversal medications available, it can become quite dangerous. A stallion, or less commonly gelding, administered acepromazine can develop a condition called priapism and/or paraphimosis where the penis will drop and not be able to be returned to the sheath. This can result in adverse consequences for breeding and in severe cases, amputation of the penis.



It is easy to reach for a medication in the drug box when you see your four legged friend injured in the field but careful consideration for each drug should be given and that should involve the consultation of an equine veterinarian. Many times catastrophe can be avoided with a simple consult. A surgical colic issue will be caught on time and not masked with banamine or a young foal's joints will be saved from irreparable damage by not giving that dose of Bayril for an infected navel. Remember to review your medications regularly for contamination, expiry and light exposure as many drugs will become inactive

resulting from these three conditions. Read and follow all the directions your veterinarian give you when they prescribe a medication. If a veterinarian isn't willing to give you a particular medication, it is likely for your horse's own good and in many cases, veterinarians are simply following the rule of law which states that vets must have examined the horse within 1 year of the time that the medication is being prescribed or given. This is referred to as a valid veterinary-patient-client relationship and is stipulated in the veterinary medical association bylaws or Provincial veterinary act. Both you and your veterinarian have the same goal in mind, to do the best thing for your horse.